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Meridian SuperNode

Commercial Systems

Feature Description Manual

MSL15 Standard 12.02 May 2001

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Commercial Systems

Feature Description Manual

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This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules, and the radio interference regulations of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense. Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC Rules, Docket No. 89-114, 55FR46066.

The MSL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe A respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

YEAR 2000 READINESS DISCLOSURE

This information was originally published prior to October 19, 1998. The foregoing legend applies retroactively in accordance with the U.S. Year 2000 Information and Readiness Act and on an ongoing basis.

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To comply with Nortel Networks Technical Documentation Standards, the Publication history contains updates for the current release and two prior releases.

May 2001

Version 12.02, Standard, MSL15. This version represents the standard release of this document and provides the following new features and enhancements:

- LDAP Synching
- M3900 Enhancements
- Call Forward Enhancements
- Virutal Office Worker (VOW) revisions

November 2000

Version 11.01, Standard, MSL14. This version represents the standard release and adds the feature A59019794, SMDI ID Override.

May 2000

Version 10.01, Standard, MSL12. This version represents the standard release and includes some pagination and graphics differences from the previous version.

- This version adds the feature A59013044, Meridian Digital Telephone M3900 Series Desktop Enhancements
- This version updates the following features:
 - AX1238, MSL: NT3X68 Tone Cards Consolidation
- This version removes the following features:
 - AX0911, TL: NT3X68 Tone Cards Consolidation

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List of terms**A-1**

About this document

When to use this document

This document contains feature description information for the Meridian SuperNode (MSL-100) Commercial Systems features in the MSL15 base load and optional groupings.

How this document is organized

The feature descriptions in this document are sorted in order of the feature number. The introduction section contains cross-reference tables that show the features sorted by the functional group and the feature number. The following sections are included for each feature:

- Feature name
- Description
- Hardware requirements
- Restrictions and limitations
- Interactions
- Datafill
- Service orders
- Operational measurements
- Logs
- User interface
- Billing

How to check the version and issue of this document

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

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

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

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

References for this document

Refer to the following documents for more information on the features described in this document:

- *Translations Guide*, 555-4001-350
- *Service Order Reference Manual*, 555-4031-808
- *Operational Measurements Reference Manual*, 555-4031-814
- *Log Report Reference Manual*, 555-4031-840
- *Customer Data Schema*, 555-4031-851
- *Office Parameters Reference Manual*, 555-4031-855
- *MSL15 Application Planning Guide*
- *Master Index of Publications*, 555-4031-001

What precautionary messages mean

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

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

Examples of the precautionary messages follow.

ATTENTION - Information needed to perform a task

ATTENTION

If the unused DS-3 ports are not deprovisioned before a DS-1/VT Mapper is installed, the DS-1 traffic will not be carried through the DS-1/VT Mapper, even though the DS-1/VT Mapper is properly provisioned.

DANGER - Possibility of personal injury



DANGER

Risk of electrocution

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

WARNING - Possibility of equipment damage



WARNING

Damage to the backplane connector pins

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

CAUTION - Possibility of service interruption or degradation



CAUTION

Possible loss of service

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

How commands, parameters, and responses are represented

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

Input prompt (>)

An input prompt (>) indicates that the information that follows is a command:

>BSY

Commands and fixed parameters

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

>BSY CTRL

Variables

Variables are shown in lowercase letters:

>BSY CTRL ctrl_no

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

Responses

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

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

FP 3 Busy CTRL 0: Command passed.

1 Meridian SL-100 feature descriptions

The features in this document are sorted in order of the feature number. The format for the feature numbers increased to nine characters in MSL11. Specifically, new feature numbers begin with an alpha character, followed by eight numbers (for example, A59006982).

Table 1-1 and Table 1-2 list Meridian SL-100 specific features available in MSL12. The information in Table 1-1 is sorted by functional group and functionality. The information in Table 1-2 is sorted by feature number. Refer to the individual feature descriptions following this introductory section for feature information.

Note: Many of the features in MSL10 and MSL11 have features associated with them in the lower layers. These features are documented in the description section of this manual, but are not listed in the following tables. For example, feature AX0947, MSL: Flexible LEN, has two other features associated with it at the CCM (common) and XPM (extended peripheral module) layers.

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 1 of 8)

Functional group	Functionality	Feature number	Feature name
MSL BASE	MSL Carrier ID Log	AX0378	Carrier System ID Log Enhancements
	MSL Enhncd IPE Cntroller	A59007133	Enhanced IPE Controller
	MSL FCC DID Answer Supervision	AD4550	FCC DID Answer Supervision Compliance
	MSL MAT for SL100	AX0377	MAT GUI & Cabletron Development
	MSL Monitor-MAP Terminal Activity	AD2066	Monitor User Activity
	MSL Pad Provisioning	AG0621	PAD Provisioning Software

1-2 Meridian SL-100 feature descriptions

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 2 of 8)

Functional group	Functionality	Feature number	Feature name
	Meridian SL-100 Cabinetized Software	AD0757	MMI Software Interface for Cabinetized Meridian SL-100
	MSL SNMP Enhmt Optivity Telephony Manager for Meridian SL-100	A59007614	SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100
	MSL Sup Throttle DID	AD9716	Answer Supervision Throttling for DID Calls
	MSL Trunk Mem Display	AD9693	Trunk Member Display
		AD9699	LINE 117/125 Log Enhancements
MSL CLASS OPT	MSL Class on IPE	AX0374	CLASS on IPE
	MSL SMDR Per Use	AX0376	SMDR Per Use Billing for Features
MSL EIU OPT	MSL Rltime Billing over EIU	A59006982	Real-time SMDR Over EIU
MSL ISDN PRI OPT	MSL PRI ON RSC-S	A59009240	PRI on RCC2 for MSL-100
MSL IVD	MSL Auto Data IPE Line	AD9718	Automated Datafill for IPE Line Cards
	MSL Auto Recovery DLM/IPES	AD7674	Auto Recovery DLM/IPES
	MSL CFB/CFD Per Key	AD9720	CFB/CFD Per Key Destination
	MSL CWT Enhance	AX0687	Call Waiting Enhancements
	MSL Desktop Evolution	A59007055	Meridian Digital Telephone Flash Download
		A59007068	Meridian Digital Telephone DN Download
		A59007097	Meridian Digital Telephone Provisioning & Soft Key Configuration
		A59007106	Meridian Digital Telephone Key Based Access Expansion Module

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 3 of 8)

Functional group	Functionality	Feature number	Feature name
	MSL Digital 64 kbit/s Sync MSL Digital Phones M2000 Display	A59007115	Meridian Digital Telephone Display Based Access Expansion Module
		A59007124	Meridian Digital Telephone Group Listening & Password Reset
		A59013044	Meridian Digital Telephone (M3900 Series) Desktop Enhancements
		AD7655	Digital Set Support of 64kbit/s Sync Data
		AD0897	M2317 Updates and Feature Interactions
		AD0068	DLM Takeover
		AD0069	DLM Maintenance Enhancements
		AD0070	IVD Facility Maintenance Enhancements
		AD0303	IVD Maintenance With Relay Port Card
		AD0305	PM for Remote DLM/DLM Maint Card
		AD0306	IVD LGC Call Progress Indications
		AD0468	M3000 and Delta II Service Orders
		AD0898	DLM PM Upgrade
		AD1288	ARIES Table Control & CPI
		AD1289	Aries XPM Software
		AD1670	Aries Digital Set Interface Processor Firmware
		AD1671	Aries Data Firmware
		AD1782	Aries Service Orders
		AD1785	Aries Feature Operation and Displays

1-4 Meridian SL-100 feature descriptions

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 4 of 8)

Functional group	Functionality	Feature number	Feature name
	MSL Digital Phones M2000 Basic	AD1979	MADO Support of Smartcom III Version 1.0
		AD3493	Enhance DLM PM Diagnostics
		AM0117	M2006 Single-Line Digital Set Support
		BC1523	IVD Maintenance
		BC1524	IVD Call Processing
		BC1525	IVD Table Control—Phase I
		BC1535	MADO Profile
		BC1536	IVD Call Processing Audits
		BC1537	IVD Data Call Processing
		BC1538	IVD Service Orders
		BC1548	IVD CP Features
		BC1558	Digital Set Diagnostics
		BF0625	IVD LGC Requirements
		BF0632	MADO T-Link F/W
		BF0808	DLM SW for Meridian Digital Sets
		BF0817	Meridian LGC Maintenance
		BF0818	CADA KBD
		BF0828	DLM—PSTS Firmware
		BV2056	IVD BAD Port Administration
	MSL Digital Phones M3000	AD0307	M3000 Table Control
		AD0340	M3000 Line Display Hooks
		AD0465	M3000 Call Progress Indication II
		AD0732	M3000 Screen Updates and Feature Calling

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 5 of 8)

Functional group	Functionality	Feature number	Feature name
	MSL Extended Peripheral Equipment	AD3064	Attendant Consoles on IPEs
		AM0032	XPEC Call Processing—Phase II
		AM0033	IPE PM Maintenance—Phase II
		AM0034	IPE Downloading
		AM0035	CC/IPE Feature Regression
		AM0036	IPE Service Orders/Query Commands
		AM0037	IPE PM Maintenance—Phase I
		AM0038	XPM Support of IPEs
		AM0039	IPE Lines Table Control
		AM0040	XPE Lines Maintenance—Phase I
		AM0041	IPE PM Table Control/Call Processing
		AM0042	XPEC Monitor
		AM0043	XPEC Message Translation
		AM0044	XPEC Maintenance—Phase I
		AM0103	XPEC Firmware
		AM0125	IPE PM Maintenance—Phase III
		AM0126	IPE Lines Maintenance—Phase II
		AM0127	XPE Link Diagnostics
		AM0128	Analog Lines on IPE
		AM0129	XPEC Message Interface—Phase II
		AM0130	XPEC Call Processing—Phase II
		AM0131	XPM IPE Interface Optimization
		AM0132	Overload Control for IPEs

1-6 Meridian SL-100 feature descriptions

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 6 of 8)

Functional group	Functionality	Feature number	Feature name
		AM0133	IPE on RCC
		AM0134	DTSR Audits for IPEs
		AM0135	PMDEBUG Interface to XPEC Monitor
		AM0140	XPEC Self Test and Diagnostics Firmware
	MSL Flex LEN on IPE	AX0947	Flexible LEN
	MSL Line Side T1 IPE Interface	AD7656	Line Side T1 Interface on Intelligent Peripheral Equipment
	MSL M2008 Handsfree	AD8420	M2008 Handsfree Support
	MSL M2616CT Dig Term	AD9719	M2616CT & ATA Support
	MSL Meridian Telecenter	AM0164	Meridian Telecenter
	MSL MSMWI for 2500 Sets	AX0427	MSMWI for IBN CLASS Sets
	MSL MW LCD Activation	AX0843	Message Waiting LCD Activation
	MSL RSC DLM Meridian Digital Sets	AD0640	RSC-DLM Basic
	MSL RSC DLM with ESA	AD0902	RSC-DLM ESA and Intraswitching
	MSL Remote DLM with ESA	AD0641	RDLM ESA
		AD0469	RMM for Remote DLM
		AD0901	ESA REX Test for RDLM
MSL NSS	MSL 700/800/900 Services	AD1802	MSN N00 Dialing
	MSL Enhanced Tandem Services	AD2146	Personal Identification Numbers
	MSL Enhanced Tandem Services	AD2175	Feature Group D ANI Delivery
		AD2186	Private Speed Calling and Hotline Dialing

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 7 of 8)

Functional group	Functionality	Feature number	Feature name
MSL STATION FEATURES		AD2468	NSS ANI Delivery
		AD2854	NSS Validated Account Codes and Authcode Last Dialing Plan
		AM0145	NSS: PIN Collection on Centrex Originations
		AD9725	VCDR Removal
	MSL NSS Database Control Point	AD2472	NSS-DBCP Base
	MSL NSS N00 DBCP Process	AD3468	Replace Dialed Digits II
		AD8425	DBCP ANI Validation
	MSL NSS Travel Card Number Validation	AD2856	NSS-DBCP Travel Card Number Validation
	MSL Travel Card Services	AD1946	MSN Travel Card Number Database
		AD2185	MSN Travel Card Call Processing
	MSL NPA FREECALL Expansion for NSS	AD9343	NPA FREECALL Expansion for NSS
	MSL AAB Enhancement	A59007002	AAB Enhancement
	MSL Attendant Console End-to-End Signaling	AD8418	Attendant Console End-to-End Signaling
	MSL Call FWD Indication	AD9694	Call Forward Indication
	MSL Call Forward TOD	AX0946	Call Forward Time of Day
	MSL Call Join	AX1160	Call Join
	MSL Callpark Auto DN	AX0380	Call Park Enhancement—SYSPARK
	MSL Fast Transfer Digital Sets	AD7658	Fast Transfer on Digital Sets
	MSL ISUP NAS RLT	AD3285	NAS RLT IBN ISUP Trunk Interactions

Table 1-1 Meridian SL-100 features, sorted by functional group (Sheet 8 of 8)

Functional group	Functionality	Feature number	Feature name
MSL WBAND	MSL Name Display Character Extension MSL NAS RLT Enhance MSL Multiple Station Message Indication MSL Music on Transfer MSL Secure Set Support MSL Virtual Office Worker MSL SMDI ID Override MSL ISUP Broadcast Fan Out MSL Nx64 Wideband Flex Bandwidth MSL Wideband PRI IBN Dialable Wideband MSL Wideband Stability Robust	AD3286	NAS RLT AC Special Function Key
		AD3287	NAS RLT Table Control and ISUP Messaging
		AD3288	Remote Trunk ID Display at AC
		AX1240	Name Display Character Extension
		AD9714	NAS RLT Enhancements
		AD8422	Multiple Message Waiting Indication
		A59006994	Music On Transfer
		AD8419	Secure Feature Set
		AX1236	Virtual Office Worker
		A59019794	SMDI ID Override
		AD3092	Broadcast Table Control Enhancements
		AD3093	Broadcast Fan-out Nodal Setup
		AD3257	Power Call Processing Architecture Enhancements
		AD3259	Broadcast Interworking/Feature Interactions
		AD3366	Power Feature Enhancements and Maintenance Support
		AD3879	Power—Nx64 Wideband Optionality
		AD7654	Dialable Wideband CALLP Matrix-to-Crossheads Additions
		AD7664	Magistrand SS7 Feature Robustification

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 1 of 11)

Feature number	Feature name	Functional group	Functionality
A59006982	Real-time SMDR Over EIU	MSL EIU OPT	MSL Rltime Billing over EIU
A59006994	Music On Transfer	MSL STATION FEATURES	MSL Music on Transfer
A59007002	AAB Enhancement	MSL STATION FEATURES	MSL AAB Enhancement
A59007055	Meridian Digital Telephone Flash Download	MSL IVD	MSL Desktop Evolution
A59007068	Meridian Digital Telephone DN Download	MSL IVD	MSL Desktop Evolution
A59007097	Meridian Digital Telephone Provisioning & Soft Key Configuration	MSL IVD	MSL Desktop Evolution
A59007106	Meridian Digital Telephone Key Based Access Expansion Module	MSL IVD	MSL Desktop Evolution
A59007115	Meridian Digital Telephone Display Based Access Expansion Module	MSL IVD	MSL Desktop Evolution
A59007124	Meridian Digital Telephone Group Listening & Password Reset	MSL IVD	MSL Desktop Evolution
A59007133	Enhanced IPE Controller	MSL BASE	MSL Enhncd IPE Cntroller
A59007614	SNMP Enhancements for Optivity Telephony Manager for MSL-100	MSL BASE	MSL SNMP Enhmt Optivity Telephony Manager for MSL-100
A59009240	PRI on RCC2 for MSL-100	MSL ISDN PRI OPT	MSL PRI on RSC-S
A59013044	Meridian Digital Telephone (M3900 Series) Desktop Enhancements	MSL IVD	MSL Desktop Evolution
A59019794	SMDI ID Override	MSL	SMDI ID Override
AD0068	DLM Takeover	MSL IVD	MSL Digital Phones M2000 Basic

1-10 Meridian SL-100 feature descriptions**Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 2 of 11)**

AD0069	DLM Maintenance Enhancements	MSL IVD	MSL Digital Phones M2000 Basic
AD0070	IVD Facility Maintenance Enhancements	MSL IVD	MSL Digital Phones M2000 Basic
AD0299	SAS via X.25	MSLD NTWK MGMT	MSLD Network Mgmt Enhancement
AD0303	IVD Maintenance With Relay Port Card	MSL IVD	MSL Digital Phones M2000 Basic
AD0305	PM for Remote DLM/DLM Maint Card	MSL IVD	MSL Digital Phones M2000 Basic
AD0306	IVD LGC Call Progress Indications	MSL IVD	MSL Digital Phones M2000 Basic
AD0307	M3000 Table Control	MSL IVD	MSL Digital Phones M3000
AD0340	M3000 Line Display Hooks	MSL IVD	MSL Digital Phones M3000
AD0465	M3000 Call Progress Indication II	MSL IVD	MSL Digital Phones M3000
AD0468	M3000 and Delta II Service Orders	MSL IVD	MSL Digital Phones M2000 Basic
AD0469	RMM for Remote DLM	MSL IVD	MSL Remote DLM with M2000
AD0640	RSC-DLM Basic	MSL IVD	MSL RSC DLM Meridian Digital Sets
AD0641	RDLM ESA	MSL IVD	MSL Remote DLM with ESA
AD0732	M3000 Screen Updates and Feature Calling	MSL IVD	MSL Digital Phones M3000

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 3 of 11)

AD0757	MMI Software Interface for Cabinetized Meridian SL-100	MSL BASE	MSL-100 Cabinetized Software
AD0897	M2317 Updates and Feature Interactions	MSL IVD	MSL Digital Phones M2000 Display
AD0898	DLM PM Upgrade	MSL IVD	MSL Digital Phones M2000 Basic
AD0901	ESA REX Test for RDLM	MSL IVD	MSL Remote DLM with M2000
AD0902	RSC-DLM ESA and Intraswitching	MSL IVD	MSL RSC DLM with ESA
AD1288	ARIES Table Control & CPI	MSL IVD	MSL Digital Phones M2000 Basic
AD1289	Aries XPM Software	MSL IVD	MSL Digital Phones M2000 Basic
AD1670	Aries Digital Set Interface Processor Firmware	MSL IVD	MSL Digital Phones M2000 Basic
AD1671	Aries Data Firmware	MSL IVD	MSL Digital Phones M2000 Basic
AD1782	Aries Service Orders	MSL IVD	MSL Digital Phones M2000 Basic
AD1785	Aries Feature Operation and Displays	MSL IVD	MSL Digital Phones M2000 Basic
AD1802	MSN N00 Dialing	MSL NSS	MSL 700/800/900 Services
AD1946	MSN Travel Card Number Database	MSL NSS	MSL Travel Card Services
AD1979	MADO Support of Smartcom III Version 1.0	MSL IVD	MSL Digital Phones M2000 Basic

1-12 Meridian SL-100 feature descriptions**Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 4 of 11)**

AD2066	Monitor User Activity	MSL BASE	MSL Monitor-MAP Terminal Activity
AD2146	Personal Identification Numbers	MSL NSS	MSL Enhanced Tandem Services
AD2175	Feature Group D ANI Delivery	MSL NSS	MSL Enhanced Tandem Services
AD2185	MSN Travel Card Call Processing	MSL NSS	MSL Travel Card Services
AD2186	Private Speed Calling and Hotline Dialing	MSL NSS	MSL Enhanced Tandem Services
AD2468	NSS ANI Delivery	MSL NSS	MSL Enhanced Tandem Services
AD2472	NSS-DBCP Base	MSL NSS	MSL NSS Database Control Point
AD2854	NSS Validated Account Codes and Authcode Last Dialing Plan	MSL NSS	MSL Enhanced Tandem Services
AD2856	NSS-DBCP Travel Card Number Validation	MSL NSS	MSL NSS Travel Card Number Validation
AD3064	Attendant Consoles on IPEs	MSL IVD	MSL Extended Peripheral Equipment
AD3092	Broadcast Table Control Enhancements	MSL WBAND	MSL ISUP Broadcast Fan Out
AD3093	Broadcast Fan-out Nodal Setup	MSL WBAND	MSL ISUP Broadcast Fan Out
AD3257	Power Call Processing Architecture Enhancements	MSL WBAND	MSL ISUP Broadcast Fan Out
AD3259	Broadcast Interworking/Feature Interactions	MSL WBAND	MSL ISUP Broadcast Fan Out
AD3285	NAS RLT IBN ISUP Trunk Interactions	MSL STATION FEATURES	MSL ISUP NAS RLT
AD3286	NAS RLT AC Special Function Key	MSL STATION FEATURES	MSL ISUP NAS RLT

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 5 of 11)

AD3287	NAS RLT Table Control and ISUP Messaging	MSL STATION FEATURES	MSL ISUP NAS RLT
AD3288	Remote Trunk ID Display at AC	MSL STATION FEATURES	MSL ISUP NAS RLT
AD3366	Power Feature Enhancements & Maintenance Support	MSL WBAND	MSL ISUP Broadcast Fan Out
AD3468	Replace Dialed Digits II	MSL NSS	MSL NSS N00 DBCP Process
AD3493	Enhance DLM PM Diagnostics	MSL IVD	MSL Digital Phones M2000 Basic
AD3513	Layer 2 OMs for D-Channel Backup	MSLD ISDN	MSLD Primary Rate Access
AD3879	Power—Nx64 Wideband Optionality	MSL WBAND	MSL Nx64 Wideband Flex Bandwidth
AD4550	FCC DID Answer Supervision Compliance	MSL BASE	MSL FCC DID Answer Supervision
AD7655	Digital Set Support of 64kbit/s Sync Data	MSL IVD	MSL Digital 64 kbit/s Sync
AD7658	Fast Transfer on Digital Sets	MSL STATION FEATURES	MSL Fast Transfer Digital Sets
AD7674	Auto Recovery DLM/IPES	MSL IVD	MSL Auto Recovery DLM/IPES
AD8418	Attendant Console End-to-End Signaling	MSL STATION FEATURES	MSL Attendant Console End-to-End Signaling
AD8419	Secure Feature Set	MSL STATION FEATURES	MSL Secure Set Support
AD8420	M2008 Handsfree Support	MSL IVD	MSL M2008 Handsfree
AD8422	Multiple Message Waiting Indication	MSL STATION FEATURES	MSL Multiple Station Message Indication

1-14 Meridian SL-100 feature descriptions**Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 6 of 11)**

AD8425	DBCP ANI Validation	MSL NSS	MSL NSS N00 DBCP Process
AD9343	NPA FREECALL Expansion for NSS	MSL BASE	MSL NPA FREECALL Expansion for NSS
AD9693	Trunk Member Display	MSL BASE	MSL Trunk Mem Display
AD9694	Call Forward Indication	MSL STATION FEATURES	MSL Call FWD Indication
AD9699	LINE 117/125 Log Enhancements	MSL BASE	MSL SL-100 Cabinetized Software
AD9714	NAS RLT Enhancements	MSL STATION FEATURES	MSL NAS RLT Enhance
AD9716	Answer Supervision Throttling for DID Calls	MSL BASE	MSL Sup Throttle DID
AD9718	Automated Datafill for IPE Line Cards	MSL IVD	MSL Auto Data IPE Line
AD9719	M2616CT and ATA Support	MSL IVD	MSL M2616CT Dig Term
AD9720	CFB/CFD Per Key Destination	MSL IVD	MSL CFB/CFD Per Key
AD9725	VCDR Removal	MSL NSS	MSL NSS Billing Platform
AG0621	PAD Provisioning Software	MSL BASE	MSL Pad Provisioning
AM0032	XPEC Call Processing—Phase II	MSL IVD	MSL Extended Peripheral Equipment
AM0033	IPE PM Maintenance—Phase II	MSL IVD	MSL Extended Peripheral Equipment
AM0034	IPE Downloading	MSL IVD	MSL Extended Peripheral Equipment

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 7 of 11)

AM0035	CC/IPE Feature Regression	MSL IVD	MSL Extended Peripheral Equipment
AM0036	IPE Service Orders/Query Commands	MSL IVD	MSL Extended Peripheral Equipment
AM0037	IPE PM Maintenance—Phase I	MSL IVD	MSL Extended Peripheral Equipment
AM0038	XPM Support of IPEs	MSL IVD	MSL Extended Peripheral Equipment
AM0039	IPE Lines Table Control	MSL IVD	MSL Extended Peripheral Equipment
AM0040	XPE Lines Maintenance—Phase I	MSL IVD	MSL Extended Peripheral Equipment
AM0041	IPE PM Table Control/Call Processing	MSL IVD	MSL Extended Peripheral Equipment
AM0042	XPEC Monitor	MSL IVD	MSL Extended Peripheral Equipment
AM0043	XPEC Message Translation	MSL IVD	MSL Extended Peripheral Equipment
AM0044	XPEC Maintenance—Phase I	MSL IVD	MSL Extended Peripheral Equipment
AM0103	XPEC Firmware	MSL IVD	MSL Extended Peripheral Equipment
AM0117	M2006 Single-Line Digital Set Support	MSL IVD	MSL Digital Phones M2000 Basic

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 8 of 11)

AM0125	IPE PM Maintenance—Phase III	MSL IVD	MSL Extended Peripheral Equipment
AM0126	IPE Lines Maintenance—Phase II	MSL IVD	MSL Extended Peripheral Equipment
AM0127	XPE Link Diagnostics	MSL IVD	MSL Extended Peripheral Equipment
AM0128	Analog Lines on IPE	MSL IVD	MSL Extended Peripheral Equipment
AM0129	XPEC Message Interface—Phase II	MSL IVD	MSL Extended Peripheral Equipment
AM0130	XPEC Call Processing—Phase II	MSL IVD	MSL Extended Peripheral Equipment
AM0131	XPM IPE Interface Optimization	MSL IVD	MSL Extended Peripheral Equipment
AM0132	Overload Control for IPEs	MSL IVD	MSL Extended Peripheral Equipment
AM0133	IPE on RCC	MSL IVD	MSL Extended Peripheral Equipment
AM0134	DTSR Audits for IPEs	MSL IVD	MSL Extended Peripheral Equipment
AM0135	PMDEBUG Interface to XPEC Monitor	MSL IVD	MSL Extended Peripheral Equipment
AM0140	XPEC Self Test & Diagnostics Firmware	MSL IVD	MSL Extended Peripheral Equipment
AM0145	NSS: PIN Collection on Centrex Originations	MSL NSS	MSL Enhanced Tandem Services

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 9 of 11)

AM0164	Meridian Telecenter	MSL IVD	MSL Meridian Telecenter
AX0374	CLASS on IPE	MSL CLASS OPT	MSL CLASS on IPE (Note)
AX0376	SMDR Per Use Billing or Features	MSL CLASS OPT	MSL SMDR Per Use (Note)
AX0378	Carrier System ID Log Enhancements	MSL BASE	MSL Carrier ID Log
AX0380	Call Park Enhancement—SYSPARK	MSL STATION FEATURES	MSL Callpark Auto DN
AX0427	MSMWI for IBN CLASS Sets	MSL IVD	MSL MSMWI for 2500 Sets
AX0687	Call Waiting Enhancements	MSL IVD	MSL CWT Enhance
AX0843	Message Waiting LCD Activation	MSL STATION FEATURES	MSL MW LCD Activation
AX0946	Call Forward Time of Day	MSL STATION FEATURES	MSL Call Forward TOD
AX0947	Flexible LEN	MSL IVD	MSL Flex LEN on IPE
AX1160	Call Join	MSL STATION FEATURES	MSL Call Join
AX1236	Virtual Office Worker	MSL STATION FEATURES	MSL Virtual Office Worker
AX1240	Name Display Character Extension	MSL STATION FEATURES	MSL Name Display Character Extension
BC1523	IVD Maintenance	MSL IVD	MSL Digital Phones M2000 Basic
BC1524	IVD Call Processing	MSL IVD	MSL Digital Phones M2000 Basic
BC1525	IVD Table Control—Phase I	MSL IVD	MSL Digital Phones M2000 Basic

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 10 of 11)

BC1535	MADO Profile	MSL IVD	MSL Digital Phones M2000 Basic
BC1536	IVD Call Processing Audits	MSL IVD	MSL Digital Phones M2000 Basic
BC1537	IVD Data Call Processing	MSL IVD	MSL Digital Phones M2000 Basic
BC1538	IVD Service Orders	MSL IVD	MSL Digital Phones M2000 Basic
BC1548	IVD CP Features	MSL IVD	MSL Digital Phones M2000 Basic
BC1558	Digital Set Diagnostics	MSL IVD	MSL Digital Phones M2000 Basic
BF0625	IVD LGC Requirements	MSL IVD	MSL Digital Phones M2000 Basic
BF0632	MADO T-Link F/W	MSL IVD	MSL Digital Phones M2000 Basic
BF0808	DLM SW for Meridian Digital Sets	MSL IVD	MSL Digital Phones M2000 Basic
BF0817	Meridian LGC Maintenance	MSL IVD	MSL Digital Phones M2000 Basic
BF0818	CADA KBD	MSL IVD	MSL Digital Phones M2000 Basic
BF0828	DLM-PSTS Firmware	MSL IVD	MSL Digital Phones M2000 Basic

Table 1-2 Meridian SL-100 features, sorted by feature number (Sheet 11 of 11)

BV2056	IVD BAD Port Administration	MSL IVD	MSL Digital Phones M2000 Basic
NC0189	Network Modem Pooling	MSL IVD	MSL Network Modem Pooling

AD0068

DLM Takeover

Functionality name

DLM Takeover

Description

A digital line module (DLM) is composed of two processors that normally share the call processing load. This software feature allows DLM units to operate independently of each other (with both in-service) and to manage both units' lines when only one of the units is in-service.

Note: The DLM is manufacture discontinued (MD) in software release MSL09. It is replaced with the intelligent peripheral equipment (IPE). Manufacture discontinue means a product is no longer manufactured or sold, but it is supported.

Hardware requirements

This feature requires that a DLM be connected between the Meridian integrated voice and data (IVD) sets and the line group controller/line trunk controller (LGC/LTC). The 1W2 or better release of parallel-serial time switch (PSTS) hardware is also required (including the NT8X49 processor board and NT8X46 connection memory board). The DLM has two working units with a minimum of two DS-30 links to the host LGC (one link for each unit). At least one IVD Port Card connects to each unit with IVD sets attached.

Due to the increased size of the LGC code needed to handle the DLM/IVD sets the following upgrades must occur:

- XPM Memory Cards
- Universal Processor Card (NTMX77AA)

Limitations and restrictions

This feature requires the 1W2 or better PSTS firmware release.

Interactions

The following list shows the interactions between DLM Takeover and other functionalities.

- AD0069 - DLM Maintenance Enhancements
- AD0070 - IVD Facility Maintenance Enhancements
- BC1523 - IVD Maintenance
- BC1524 - IVD Call Processing

AD0068
DLM Takeover (end)

- BC1525 - IVD Table Control
- BC1534 - IVD Maintenance Introduction
- BC1535 - MADO Profile
- BC1536 - IVD Call Processing Audits
- BC1537 - IVD Data Call Processing
- BC1548 - IVD CP Features
- BC1558 - Digital Set Diagnostics
- BF0625 - IVD LTC Requirements
- BF0632 - MADO T-Link F/W
- BF0818 - CADO KBD
- BF0828 - DLM-PSTS Firmware

Datafill

DLM Takeover does not affect data schema tables or office parameters.

Service Orders

DLM Takeover does not affect SERVORD.

Operational measurements

DLM Takeover does not affect operational measurements.

Logs

DLM Takeover does not affect logs.

User interface

DLM Takeover does not change the user interface.

Billing

DLM Takeover does not affect billing.

AD0069

DLM Maintenance Enhancements

Feature name

DLM Maintenance Enhancements

Description

The digital line module (DLM) is a peripheral that handles Meridian integrated voice and data (IVD) telephones on the MSL-100 switch. This software feature consists of four aspects related to the DLM.

- Logs generated by the MSL-100 switch that refer to DLMs
- Operational measurements kept by the MSL-100 switch affected by DLMs
- PM DLM level of the MAP workstation including the display, the command syntax, and the command functionality
- Meridian asynchronous data option (MADO), which is downloaded during a Return To Service (RTS) sequence

Note: The DLM and the MADO are manufacture discontinued (MD) in software release MSL09. Manufacture discontinue means that a product is no longer manufactured or sold, but it is supported. The intelligent peripheral equipment (IPE) replaces the DLM.

Hardware requirements

DLM Maintenance Enhancements has no hardware requirements.

Limitations and restrictions

DLM Maintenance Enhancements has no limitations or restrictions.

Interactions

When a MADO is datafilled in the table DPROFILE, and is brought to an InSv state for the first time, the central control (CC) sends a copy of the MADO profile to the parallel space time switch (PSTS) in the DLM. In turn, the PSTS sends the profile to the MADO. Copies of the profiles are kept by the PSTS as a backup to the copy sent to the MADO itself. If the DLM loses power, however, the copy of the profile in the PSTS is lost. Therefore, when the DLM is returned to service, the PSTS does not have the profile it had before the DLM stopped functioning.

Datafill

DLM Maintenance Enhancements does not affect data schema tables or office parameters.

AD0069

DLM Maintenance Enhancements (end)

Service Orders

DLM Maintenance Enhancements does not affect SERVORD.

Operational measurements

DLM Maintenance Enhancements does not affect operational measurements.

Logs

DLM Maintenance Enhancements does not affect logs.

User interface

DLM Maintenance Enhancements does not change the user interface.

Billing

DLM Maintenance Enhancements does not affect billing.

AD0070

IVD Facility Maintenance Enhancements

Functionality name

IVD Facility Maintenance Enhancements

Description

This feature provides maintenance to the facility side of the Meridian integrated voice and data (IVD) product such as:

- Integrated voice and data port card (IVDPC)
- Subscriber loop
- Meridian 2000 series set
- Meridian asynchronous data option (MADO)

Note: The MADO is manufacture discontinued (MD) in software release MSL07. Manufacture discontinued means a product is no longer manufactured or sold, but it is supported.

Facility maintenance commands include:

- short and extended diagnostics
- Meridian asynchronous data option test
- Station ringer test
- Automatic line tests
- MAP commands include:
 - POST
 - BUSY
 - RTS
 - CKTLOC
 - HOLD
 - NEXTP
 - NEXTH
 - CKTTST

This feature provides the following commands:

- TSTRING
- TONEGEN

AD0070**IVD Facility Maintenance Enhancements** (continued)

- RLSCON
- EQUIP
- CONNECT
- SUSTATE
- LOOPBACK
- BERT
- BERTTIME
- TSTRING
- LTPMAN

Hardware requirements

To configure Meridian 2000 series terminals on the MSL-100 switch, use the digital line module (DLM) or the intelligent peripheral equipment (IPE). In addition, a parallel-serial time switch (PSTS) card must be present. The Meridian 2000 series sets are then connected to the integrated voice/data line cards (IVDLC), with a maximum of 16 voice sets per card (each equipped with an optional data adapter).

Note: The DLM is manufacture discontinued (MD) in software release MSL09. Manufacture discontinued means a product is no longer manufactured or sold, but it is supported. The IPE replaces the DLM.

Limitations and restrictions

IVD Facility Maintenance Enhancements has no limitations or restrictions.

Interactions

IVD Facility Maintenance Enhancements has no functionality interactions.

Datafill

IVD Facility Maintenance Enhancements does not affect data schema tables or office parameters.

Service Orders

IVD Facility Maintenance Enhancements does not affect SERVORD.

Operational measurements

IVD Facility Maintenance Enhancements does not affect Operational measurements.

AD0070

IVD Facility Maintenance Enhancements (end)

Logs

IVD Facility Maintenance Enhancements does not affect logs.

User interface

IVD Facility Maintenance Enhancements does not change the user interface.

Billing

IVD Facility Maintenance Enhancements does not affect billing.

AD0251
MADO user self test

Functionality name

MADO User Self Test

Description

This software provides the means for activating the Meridian Asynchronous Data Option (MADO) Self Test on an Integrated Voice and Data (IVD) MADO card from the voice line of the set being tested.

The MADO Self Test runs a series of tests in the MADO firmware. These tests include a RAM & ROM Test, a Sanity Test and various loopback tests to the Universal Asynchronous Receiver Transmitter (UART) and X12 chips. Unlike other data product offerings, the MADO option is completely enclosed within the set, and does not have visible features such as power or test indicator lamps for function status.

This feature permits:

- A service representative to test the MADO option at installation time, even when there is no terminal present.
- A user to test the MADO option when problems arise with keyboard functionality.

Hardware requirements

The following items are necessary for MADO operation on an MSL-100:

- A Meridian M2000 series set (in which the MADO resides)
- A Digital Line Module (DLM-NT8X45) is connected between the Meridian IVD sets, the Line Group Controller (LGC) and the Line Trunk Controller (LTC). Parallel Serial Time Switch (PSTS) hardware is also required including the NT8X49 processor board and the NT8X46 connection memory board.
- At least one IVD Port Card (IVDPC-NT8X47) is connected to the DLM unit with IVD sets attached
- LGC/LTC is upgraded with a NT6X47 MP Memory Card, a NT6X46AB SP Memory Card and two (2) NT6X45AC Processor Cards

AD0251

MADO user self test (continued)

Limitations and restrictions

The following restrictions apply:

- No originations or terminations are allowed on either the voice line of the test or the data line of the set while the test is in progress.
- The test is initiated from the voice line, not the data line.
- The test not be initiated from a voice line that currently has another feature running. For example, adding the self test as the second leg of a three-way call is not permitted.
- The test may be terminated, while in process, by depressing the HOLD key. Both lines are automatically released.
- The test must be accessed from a Meridian set with the MADO option.

Interactions

The MADO Self Test needs the following features to function properly:

- BC1523 - IVD Maintenance (Maintenance and diagnostics)
- BC1524 - IVD Call Processing
- BC1537 - IVD Data Call Processing
- BC1548 - IVD CP Features
- BF0625 - IVD LTG Requirements
- BF0625 - IVD LTG Requirements
- BF0817 - Meridian LGC Maintenance

Features that can be initiated from the other valid DN's of the set are permitted during the test. The set is also allowed feature interaction such as ring-again recall and call waiting. New calls are received on the other DN. No other feature is started from the voice or data line used in test while test is in process.

Datafill

The following changes are necessary to implement the MADO User Self Test feature. The feature is activated using a customer datafillable access code that

AD0251**MADO user self test (end)**

requires that the feature to be visible in the table control man-machine interface.

Table name: IBNXLA

Field Name	Status	Range of Values	Semantic of Field
FEATURE	changed	MADO	For MADO Self Test feature

Service Orders

MADO User Self Test does not affect SERVORD.

Operational measurements

MADO User Self Test does not affect operational measurements.

Logs

MADO User Self Test does not affect logs.

User interface

MADO User Self Test does not change the user interface.

Billing

MADO User Self Test does not affect billing.

AD0303

IVD maintenance with relay port card

Functionality name

IVD Maintenance with Relay Port Card

Description

The initial release of the 8X47 Digital Port Card provided no relays or looparound capability. The facility maintenance diagnostics in BCS21 was unable to distinguish between port card faults, facility faults, and set faults.

This software feature provides the enhanced DPC (8X47BA), when used in conjunction with the 8X55 Digital Port Maintenance Card (DPMC) distinguishes between the following fault types.

The specific faults that can be detected are:

- Short Circuit
- Open Circuit
- Excessive Voltage on Loop
- DPC Power Source Defective

Self tests on the DPMC and tests performed during activation of a DPC loopback detect the following faults:

- DPMC not present
- DPMC inaccessible
- Failure of DPMC circuitry (control logic, relay drivers, facility sensors, 30V sensor, 10V sensors, 30V DPMC power source, DSIC)
- Excessive Voltage through DPMC

The DPMC provides relay drivers (to drive the relays on the enhanced DPCs), voltage and current sensors and two DSICs for set emulation. The relays are operated to provide access to the DPMC from a given line on an enhanced DPC. The sensors are used to measure the voltage and current on the subscriber loop, thus detecting short circuits, open circuits, and foreign voltages.

The two DSICs are used to perform looparound tests to verify the operation of the given DLIC port on the enhanced DPC. The DPMC also provides the capability to test its sensors, DSIC emulation circuits, and measurement circuitry against the onboard power supply and a simulated short circuit.

AD0303**IVD maintenance with relay port card** (continued)

Only one DPMC per DLM is allowed. Each DPMC can diagnose one port at a time. Therefore, it is possible that a diagnostic may fail with the result ``DPMC in use by another line on the DLM" when another diagnostic for some other line on the same DLM is currently using the DPMC. The system instructs to perform the test again

Hardware requirements

To configure Meridian 2000 and 3000 series sets on an MSL-100, the line module must be a Digital Line Module (DLM-7X49). In addition to the 6X51 and 6X52 processor and Digroup Control Cards, the DLM includes the 8X46 Parallel-Serial Time Switch and the 8X49 Digital Set Interface Processor. The Meridian 2000 and 3000 series sets can then be connected to (Enhanced) Digital Port Cards (DPC's 8X47BA), with a maximum of 16 voice sets per card (each of which may optionally be equipped with a Meridian Asynchronous Data Option).

In order to use the 8X55 Digital Maintenance Card (DPMC), the BA release of the DPC (8X47BA) must be used.

Limitations and restrictions

Only one DPMC may be installed on a given DLM and only one line on the DLM may use the DPMC at any given time.

Interactions

The following features are needed for this software to function properly:

- BC1523 - IVD Maintenance
- BC1524 - IVD Call Processing
- BC1525 - IVD Table Control
- BC1536 - IVD Call Processing Audits
- BC1537 - IVD Data Call Processing
- BC1548 - IVD CP Features
- BF0625 - IVD LTG Requirements
- BF0632 - MADA T-Link F/W
- BF0817 - Meridian LGC Maintenance
- BF0818 - MADA KBD
- BV1309 - DU Profile Downloading

AD0303

IVD maintenance with relay port card (end)

Datafill

IVD Maintenance with Relay Port Card does not affect data schema tables or office parameters.

Service Orders

IVD Maintenance with Relay Port Card does not affect SERVORD.

Operational measurements

IVD Maintenance with Relay Port Card does not affect operational measurements.

Logs

IVD Maintenance with Relay Port Card does not affect logs.

User interface

IVD Maintenance with Relay Port Card does not change the user interface.

Billing

IVD Maintenance with Relay Port Card does not affect billing.

AD0304
Remote DLM software

Functionality name

Remote DLM Software

Description

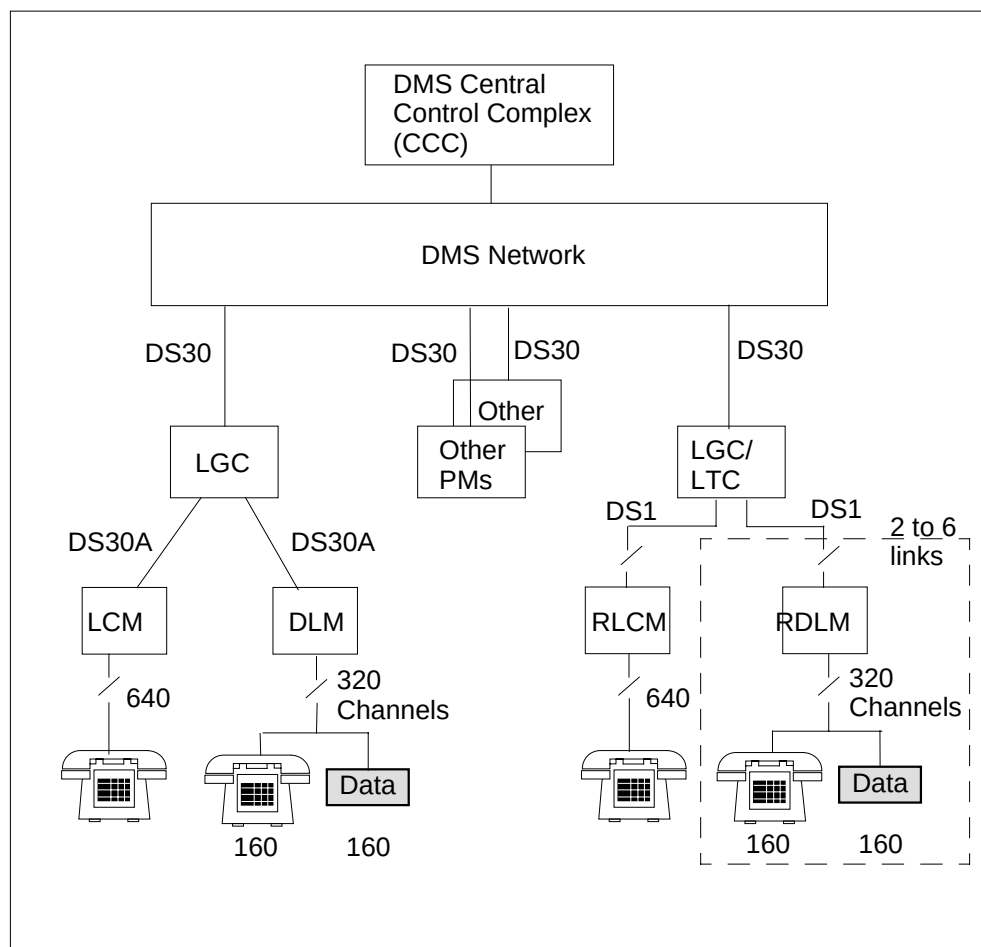
This feature allows software for the Line Concentrating Module (LCM) processor card in the Digital Line Module (DLM) to support the features and functions of a Remote DLM (RDLM). The RDLM provides Integrated zVoice/Data (IVD) service up to 150 miles from the switching network.

An RDLM supports all call processing and maintenance features supported by a host-located DLM. This support includes all call interaction and diagnostics. The following figure illustrates the RDLM Digital Multiplex System (DMS) interface.

AD0304

Remote DLM software (continued)

RDLM DMS Interface



This feature only provides support for the DS-1 interface cards and the Link Control Cards within the Remote Interface and Maintenance (RIM) module.

Hardware requirements

This feature requires a physical RDLM.

Limitations and restrictions

This feature is only available when used with a properly equipped physical remote DLM.

AD0304
Remote DLM software (end)

Interactions

This feature interacts with feature AD0305, PM Maintenance for Remote DLMs.

Datafill

Remote DLM Software does not affect data schema tables or office parameters.

Service Orders

Remote DLM Software does not affect SERVORD.

Operational measurements

Remote DLM Software does not affect operational measurements.

Logs

Remote DLM Software does not affect logs.

User interface

Remote DLM Software does not change the user interface.

Billing

Remote DLM Software does not affect billing.

AD0305

PM for remote DLM/DLM maintenance card

Functionality name

PM for Remote DLM/DLM Maintenance Card

Description

This feature provides the Peripheral Module Maintenance code for Remote Digital Line Modules (RDLMs). The Digital Line Module (DLM) is a peripheral created to handle the Meridian Integrated Voice and Data (IVD) telephones on the MSL-100 switch. A remote DLM performs the same functions as a DLM at distances from 50 feet to 150 miles away from the host. The connection between the RDLM and the Line Trunk Controller (LTC) or the Line Group Controller (LGC) at the host is made via 2 to 6 DS1 links. The connection may also be made to an Remote Switching Center (RSC), which is an LTC/LGC-like peripheral placed in a remote location.

The following areas are affected by the implementation of this feature.

- Table control—Must be able to datafill an RDLM in table DLMINV.
- Card lists—The names and positions of the cards on the RDLM must be displayed given a fault.
- Logs—The site of the RDLM is displayed along with the frame and bay, when an RDLM is referenced in a log. No new logs are added.
- MMI—The site of the RDLM is displayed when an RDLM is posted.
- Tests—New tests are added for performing diagnostics on the host interface equipment. (DS1 Cards and Link Control Cards.)

Hardware requirements

PM for Remote DLM/DLM Maintenance Card has no hardware requirements.

Limitations and restrictions

PM for Remote DLM/DLM Maintenance Card has no limitations or restrictions.

Interactions

This feature is an enhancement of the PM maintenance software supporting host DLMs. It does not affect anything that already exists; the enhancements are only used if an RDLM is present on the MSL-100.

AD0305

PM for remote DLM/DLM maintenance card (end)

Datafill

There are three new fields added to the DLMINV table. These fields indicate:

- The DS1 links assigned to the RDLM
- If the RDLM supports the intraswitched calls
- If the RDLM is equipped for emergency stand alone

Service Orders

PM for Remote DLM/DLM Maintenance Card does not affect SERVORD.

Operational measurements

PM for Remote DLM/DLM Maintenance Card does not affect operational measurements.

Logs

PM for Remote DLM/DLM Maintenance Card does not affect logs.

User interface

PM for Remote DLM/DLM Maintenance Card does not change the user interface.

Billing

PM for Remote DLM/DLM Maintenance Card does not affect billing.

AD0306

IVD LGC call process indications

Functionality name

IVD LGC Call Process Indications

Description

This feature provides the Link Group Controller (LGC) for Call Progress Indication (CPI) for the M3000 digital telephone set. Although the LGC code is implemented in this feature, the table control for M3000 sets and the Central Control (CC) CPI hooks are not available in this release. Only progression testing of the P-phone and Meridian code is required for this feature.

M3000 Digital Telephone Set

The Meridian 3000 digital telephone set is designed for use with the SL family of switches. This set offers simultaneous voice and data capabilities. The following soft keys are supported on the M3000 set:

- Call Forward (FORWARD)
- Call Park (PARK)
- Call Pickup (PICK UP)
- Call Transfer (TRANSFER)
- Make Set Busy (MAKE BUSY)
- Conference 6 (CONFERENCE)
- Message Waiting (MESSAGE)
- Privacy Release (PRIVACY OFF)
- Busy Override (JOIN BUSY CALL)
- Ring Again (RING AGAIN)
- Speed Call/User (CODE CALL)
- Auto Answerback (AUTO ANSWER)
- Switch Parties (SWITCH)
- Complete Call Transfer (JOIN PARTIES)
- Complete Conference (JOIN PARTIES)
- Hold the Call (HOLD)

The M3000 series contains keys ranging from 1 to 37. The features are assigned to key numbers for the purpose of table control. Keys 1-6 are the only

AD0306**IVD LGC call process indications** (continued)

keys to which a directory number is assigned. Keys 21-37 are reserved for future use. The following table shows the assigned keys 7-20.

Assigned keys and feature keys

Key Number	Feature
7	Call pickup
8	Message Waiting
9	Speed Calling
10	Call Forward
11	Conference Calling (6 Port)
12	Call Waiting
13	Call transfer
14	Ring Again
15	Privacy Release
16	Make Set Busy
17	Call Park
18	Override
19	Automatic Answerback
20	Display

Call Progress

Call progress information is any information which describes what is happening to a call as it proceeds through the network to its destination. Information regarding alerting of the called party, answer by the called party, and routing to treatments, tones and announcements are examples of call progress information.

M3000 Call States

The M3000 supports the following call processing states. These states are named according to MSL-100 feature names.

- IDLE: On-hook (voice and data)
- DIALTONE: ready to transmit dialed digits (voice and data)

AD0306

IVD LGC call process indications (continued)

- INTERCOM DIALTONE: ready to transmit digits for a group intercom call (voice)
- DIALING: transmitting dialed digits (voice)
- BUSY: called party off-hook (voice)
- REORDER: called party is unavailable (voice)
- RINGBACK: called party is ringing (voice)
- ERWT_CBQ: initial set of routes not available, set gets expensive route warning tone (voice)
- ESTABLISHED: connection made (voice)
- INTERCOM ESTABLISHED: connection established in a group intercom call (voice)
- CONF/XFER DIALTONE: special dialtone (voice)
- CONF/XFER DIALING: ready to transmit digits on CONF/XFER call (voice)
- CONF/XFER BUSY: after special dialtone, called party is off-hook (voice)
- CONF/XFER REORDER: after special dialtone, called party is unavailable (voice)
- XFER RINGBACK: ringing called party for XFER (voice)
- CONF RINGBACK: ringing called party for CONF (voice)
- CONSULTATION: the 3rd party has answered the call (voice)
- CONSULTATION HOLD: one line on hold while other line is active (voice)
- ESTABLISHED HOLD: call held by other party (voice)

Hardware requirements

IVD LGC Call Progress Indications has no hardware requirements.

Limitations and restrictions

This feature requires regression testing for p-phones and Meridian sets to verify that implementation of this feature does not affect current operation. This feature requires a new table control code (AD0307), and new CC CPI code changes.

AD0306

IVD LGC call process indications (end)

Interactions

IVD LGC Call Process Indications has no functionality interactions.

Datafill

IVD LGC Call Process Indications does not affect data schema tables or office parameters.

Service Orders

IVD LGC Call Process Indications does not affect SERVORD.

Operational measurements

IVD LGC Call Process Indications does not affect operational measurements.

Logs

IVD LGC Call Process Indications does not affect logs.

User interface

IVD LGC Call Process Indications does not change the user interface.

Billing

IVD LGC Call Process Indications does not affect billing.

AD0307

M3000 table control

Functionality name

M3000 Table Control

Description

This feature provides table control and the data structure necessary to support the Meridian M3000 series set and the Meridian 2317 set on the MSL-100.

The features available to the Meridian 3000 are consistent with the Meridian 2000 series with the following exceptions:

- The M3000 set has 6 port conference available rather than the Three Way Calling (3WC) feature.
- Malicious Call Hold (MCH) is not available in the soft keys of the M3000 set but is assignable as a code access feature.
- Automatic Dialing (AUD) is not available in the soft keys of the M3000 set, rather the direction of the M3000 set takes the place of the AUD feature.

Meridian M3000 series

The Meridian 3000 digital telephone set, also called the Integrated Voice and Data (IVD) set, provides a standard feature handset, a speaker for voice and tone alerting, and a touch sensitive screen with no hard keys. The Meridian 3000 series offers the user simultaneous voice and data capabilities.

Support of the M3000 set does not require any new customer tables. The set joins the Meridian list in the tables IVDINV, KSETLINE, and KSETFEAT. Table IVDINV is used for configuration information for the new M3000 sets and Meridian Asynchronous Data Option (MADO). Tables KSETLINE and KSETFEAT are still used for line and feature appearances.

The format used for the M3000 set and the MADO in table IVDINV contains configuration information as follows:

- the LEN to which the set is assigned
- the Meridian set type (M3000 or MADO)

The M3000 series set contains keys ranging from 1 to 37. The features are assigned to a key number for the purpose of table control. Keys 1 through 6 are the only keys to which a directory number is assigned. Keys 7 through 19 are assigned the features associated with them. Keys 20 through 37 are reserved for future use.

AD0307**M3000 table control** (continued)

Keys 7 through 19 are assigned as follows:

Key number	Feature
7	Call Pickup
8	Message Waiting
9	Speed Call
10	Call Forwarding
11	Conference Calling (6 port)
12	Call Waiting
13	Call Transfer
14	Ring Again
15	Privacy Release
16	Make Set Busy
17	Call Park
18	Executive Busy Override
19	Automatic Answerback

M2317 set series

The Meridian M2317 set, also known as the Delta II set, provides a standard feature headset, a 2-line display, handsfree capability, 11 hard keys and 5 soft keys. Directories and features are assigned to these keys. The 5 soft keys are only assigned to features.

When the M2317 set is idle, the time and date appear on the 2-line display. The user makes a call by touching the directory number key, lifting the handset, or touching the handsfree feature. The digits dialed appear on the 2-line display.

Support of the M2317 set does not require any new customer tables. The sets join the M3000 and the other Meridian IVD line in tables IVDINV, KSETLINE, and KSETFEAT. Table IVDINV is used for configuration information for new M2317 sets and MAD0. Tables KSETLINE and KSETFEAT are used for line and feature appearances on all IVD sets.

AD0307**M3000 table control** (continued)**Feature types**

The features assigned to the Meridian sets in table KSETFEAT are grouped into categories called Set Features. These features are associated with all DN appearances on the set.

- **Set feature:** A set feature is assigned to a vacant key on the set.
 - For M3000 set: A vacant key on the M3000 set refers to a soft key that is not assigned. Features are not assigned to keys 2-6 as these keys are reserved for DNs and intercom. The primary directory number is assigned to key 1. The soft keys on the M3000 set are accessed via a touch sensitive screen. A feature that has a key associated with it on the set, is not assigned to any key.
 - For M2317 set: A vacant key on the M2317 set refers to a hard or soft key that is not assigned. Features requiring a separate key are assigned to keys 2 through 20. Keys 2 through 11 are considered hard keys and are accessed by depressing the appropriate key. Keys 12 through 20 are associated with the 5 soft keys. The soft keys take on different features based on the call state of the set.
- **Subset Features:** A subset feature is a specified subset of a DN on the set.
- **Key Features:** These features are assigned to a vacant key on the set and are independent of any Dn appearances. There can be more than one appearances of these feature keys on a single set.
- **Directory Number Features:** These features do not require a separate key on the set and are associated with an individual DN appearance on the set. These features are assigned to as many of the set's DN appearances as desired.
- **Code Access Features:** Some set features (SCS, SCL, SCU, PRK, DCPK, EBO, CNF, MCH) and some subset features (CPU, CFX) may be assigned as code access features. When assigned as code access features, they do not require a separate key on the set. The DN feature AAB may also be assigned as a code access feature. The feature is activated by dialing the access code for the specific feature (if the call state is other than idle—ringing, busy, active call—then the access code must be preceded by depression of either the CNF or CTR key to generate a flash).

Set features (Sheet 1 of 2)

Feature	M3000 key	M2317 key
Call Transfer (CTR)	13	18
6-Way Conference (CNF)	11	17

AD0307**M3000 table control** (continued)**Set features (Sheet 2 of 2)**

Feature	M3000 key	M2317 key
Call Park (PRK)	17	12
Executive Busy Override (EBO)	18	2-11
Speed Call Long (SCL)	18	2-11
Speed Call Short (SCS)	9	15
Speed Call User (SCU)	9	15
Make Set Busy (MSB)	16	2-11
Ring Again (RAG)	14	19
Privacy Release (PRL)	15	20
Directed Call Park (DCP)	code access	2-11 or code access
3-Way Calling (3WC)	code access	2-11
Malicious Call Hold (MCH)	code access	2

Subset feature

Feature	M3000 key	M2317 key
CPU	7	13
CFX	10	16
CWT	12	2-11

Key features

Feature	M3000 key	M2317 key
AUD	Replaced by dialing	2-11
ICM	2-6	2-11

AD0307

M3000 table control (continued)

Directory number features

Feature
Automatic Line
Special Billing
Denied Incoming
Subscriber Line Usage
Line Study
Calling Line Identification
Do Not Disturb
Private Business Line (not assigned to PDN)
Random Make Busy
Requested Suspension
Stop Hunt
Security Code
Automatic Answerback
Message Waiting

Hardware requirements

In order to configure Meridian series terminals, as well as 2000 series terminals, on an MSL-100, the line module used must be a Digital Line Module (DLM). The DLM consists of the following cards:

- 6X53 power card
- 6X51 DLM processor card
- 6X52 Digroup Control card
- 8X49 Parallel Serial Time Switch (PSTS) processor card
- 8X46 PSTS card
- 1 to 5 8X47 Digital Port Cards (DPCs)

AD0307**M3000 table control** (continued)

The Meridian set is connected to the new Digital Port Card (DPC). The DPC is a 32-port line card, with 16 voice and 16 data ports. The even numbered ports (0, 2, ...30) are the voice ports and the odd-numbered ports (1,3 ...) are the data ports.

Limitations and restrictions

The features available to the Meridian set user are consistent with those available on p-phones and Data Units. One exception is that the EXT option is not available.

The features available to the Meridian 3000 are consistent with the Meridian 2000 series with the following exceptions:

- The M3000 set has 6 port conference available rather than the Three Way Calling (3WC) feature.
- The time and date are displayed on the screen of the touch set when the set is idle.
- Malicious Call Hold (MCH) is not available in the soft keys of the M3000 set but is assignable as a code access feature.
- Automatic Dialing (AUD) is not available in the soft keys of the M3000 set, rather the direction of the M3000 set takes the place of the AUD feature.

When assigning LENS to the DLM, the user is restricted to entering only 0 to 9 in the drawer (or line subgroup) position of the LEN.

When assigning a Meridian voice set to a LEN number, the set is only added to an even numbered LEN.

Interactions

M3000 Table Control has no functionality interactions.

Datafill

The Meridian 2317 and 3000 series are datafilled in table IVDINV and table KSETFEAT. Table IVDINV is modified to accept new set types, M3000 and M2317. Table KSETFEAT is modified to allow the M3000 set to accept keys up to 19 when assigning features to the set. For the M2317 set, the table only accepts keys up to key 20 when assigning features to the set. It is also modified to check that the soft key features are associated with the proper keys and that the soft keys are only assigned their associated features.

AD0307

M3000 table control (end)

Service Orders

M3000 Table Control does not affect SERVORD.

Operational measurements

M3000 Table Control does not affect operational measurements.

Logs

M3000 Table Control does not affect logs.

User interface

M3000 Table Control does not change the user interface.

Billing

M3000 Table Control does not affect billing.

AD0340
M3000 line display hooks

Functionality name

M3000 Line Display Hooks

Description

This feature provides the Line Group Controller (LGC) requirements of call information to the Meridian 3000 series.

Meridian 3000

The Meridian 3000 digital telephone set is designed for use with Nortel's MSL family of digital switches. This set offers the user simultaneous voice and data capabilities.

The M3000 series voice set provides a standard feature handset, a speaker for voice and tone alerting, and a touch sensitive screen with no hard keys. All the telephone operations are done by touching the softkeys on the screen. The set has a built in handsfree unit and contains the Touch Asynchronous Data Option (TADO). The TADO is necessary for data transmission and consists of a single file-installable printed circuit board that mounts within the housing of the Meridian 3000 series voice set

When the M3000 series set is idle, the screen displays time and date. The user makes a call by touching the screen Directory Number (DN) icons, or lifting the handset, or touching the handsfree feature. The set then displays another screen. The display on the screen is context dependent. The digits dialed are displayed to the user.

The M3000 series set contains keys ranging from 1 to 37. Even though the set only has software defined keys, the features are assigned to a key number for the purpose of table control. Keys 1 through 6 are the only keys to which a DN is assigned. When defining keys 7 to 20 on the M3000 set, these keys are only assigned the features that are associated with them as shown in the following table. Keys 21 through 37 are reserved for future expansion.

Assigned keys and features (Sheet 1 of 2)

Key Number	Feature
7	Call Pickup
8	Message Waiting
9	Speed Calling

AD0340**M3000 line display hooks** (continued)

Assigned keys and features (Sheet 2 of 2)

Key Number	Feature
1 0	Call Forwarding
11	Conference Calling (6 Port)
12	Call Waiting
13	Call Transfer
1 4	Ring Again
1 5	Privacy Release
1 6	Make Set Busy
1 7	Call Park
1 8	Override
1 9	Automatic Answerback
2 0	Display Key

P-phone 2-Line Display

The display P-phone is a standard P-phone with a 32 character alphanumeric Liquid Crystal Display (LCD). This display is divided into two lines, each 16 characters in length. As a general rule, the upper display line is used for displaying the calling party information; the lower display line is used to echo the digits dialed.

Display M3000 vs P-phone

The following are the display differences between the M3000 and the P-phone

- For the M3000 set, if more than 30 digits are entered, the display wraps around and overwrites the digits.
- The M3000 has 30-character lines available for calling/called number display.
- The P-phone has two 16-character lines for calling/called number display.
- Both sets' dialed digits echo left to right.
- For P-phones, when more than 16 digits are entered, the most significant digits are shifted left and up to the top of the display line, truncating the most significant digits of the top (calling number) display line.

AD0340

M3000 line display hooks (end)

Hardware requirements

M3000 Line Display Hooks has no hardware requirements.

Limitations and restrictions

M3000 Line Display Hooks has no limitations or restrictions.

Interactions

This feature requires that regression is performed to verify that the implementation did not affect current operations.

Datafill

M3000 Line Display Hooks does not affect data schema tables or office parameters.

Service Orders

M3000 Line Display Hooks does not affect SERVORD.

Operational measurements

M3000 Line Display Hooks does not affect operational measurements.

Logs

M3000 Line Display Hooks does not affect logs.

User interface

M3000 Line Display Hooks does not change the user interface.

Billing

M3000 Line Display Hooks does not affect billing.

AD0465

M3000 call progress indication II

Functionality name

M3000 Call Progress Indication II

Description

This feature is the second phase of the M3000 Call Progress Indication (CPI), which provides the CC hooks necessary to enable CPI on the M3000 set.

Meridian 3000

The Meridian 3000 digital telephone set is designed for use with the Nortel MSL-100 family of digital switches. This set offers the user simultaneous voice and data capabilities.

The M3000 series voice set provides a standard feature handset, a speaker for voice and tone alerting, and a touch sensitive screen with no hard keys. All the telephone operations are done by touching the softkeys on the screen. The set has a built in handsfree unit and contains the Touch Asynchronous Data Option (TADO). The TADO is necessary for data transmission and consists of a single file-installable printed circuit board that mounts within the housing of the Meridian 3000 series voice set

When the M3000 series set is idle, the screen displays time and date. The user makes a call by touching the screen Directory Number (DN) icons, or lifting the handset, or touching the handsfree feature. The set then displays another screen. The display seen on the screen is context dependent. The digits dialed are displayed to the user.

The M3000 series set contains keys ranging from 1 to 37. Even though the set only has software defined keys, the features are assigned to a key number for the purpose of table control. Keys 1 through 6 are the only keys to which a DN is assigned. When defining keys 7 to 20 on the M3000 set, these keys are only assigned the features that are associated with them as shown in the following table. Keys 21 through 37 are reserved for future expansion.

Assigned Keys and Features (Sheet 1 of 2)

Key Number	Feature
7	Call Pickup
8	Message Waiting
9	Speed Calling

AD0465**M3000 call progress indication II** (continued)**Assigned Keys and Features (Sheet 2 of 2)**

Key Number	Feature
10	Call Forwarding
11	Conference Calling (6 Port)
12	Call Waiting
13	Call Transfer
14	Ring Again
15	Privacy Release
16	Make Set Busy
17	Call Park
18	Override
19	Automatic Answerback
20	Display Key

M3000 Digital Telephone Set

The Meridian 3000 digital telephone set is designed for use with the MSL-100 family of switches. This set offers simultaneous voice and data capabilities. The following soft keys are supported on the M3000 set:

- Call Forward (FORWARD)
- Call Park (PARK)
- Call Pickup (PICK UP)
- Call Waiting (CONNECT)
- Call Transfer (TRANSFER)
- Make Set Busy (MAKE BUSY)
- Conference 6 (CONFERENCE)
- Message Waiting (MESSAGE)
- Privacy Release (PRIVACY OFF)
- Busy Override (JOIN BUSY CALL)
- Ring Again (RING AGAIN)

AD0465**M3000 call progress indication II** (continued)

- Speed Call/User (CODE CALL)
- Auto Answerback (AUTO ANSWER)
- Switch Parties (SWITCH)
- Complete Call Transfer (JOIN PARTIES)
- Complete Conference (JOIN PARTIES)
- Hold the Call (HOLD)

New soft key features

Feature	Screen Text
Predial	Make a Call
Last Number Redial	Last#
Save the Number	Save#
Display Dialpad	Dial
Redial Saved Number	Saved#
Directory Dialing	Directory
Touch Services	Touch Profile
Reset Elapsed Time	Timer

M3000 Call States

The M3000 supports the following call processing states. These states are named according to Meridian 1 feature names.

- IDLE: On-hook
- DIALTONE: ready to transmit dialed digits (voice)
- INTERCOM DIALTONE: ready to transmit digits for a group intercom call (voice)
- DIALING: transmitting dialed digits (voice)
- BUSY: called park off-hook (voice)
- REORDER: called party is unavailable (voice)
- RINGBACK: called party is ringing (voice)
- ERWT_CBQ: initial set of routes not available, set gets expensive route warning tone (voice)

AD0465**M3000 call progress indication II** (continued)

- ESTABLISHED: connection made (voice)
- INTERCOM ESTABLISHED: connection established in a group intercom call (voice)
- CONF/XFER DIALTONE: special dialtone
- CONF/XFER DIALING: ready to transmit digits on CONF/XFER call (voice)
- CONF/XFER REORDER: after special dialtone, called party is unavailable (voice)
- XFER RINGBACK: ringing called party for XFER (voice)
- CONF RINGBACK: ringing called party for CONF (voice)
- CONSULTATION: the 3rd party has answered the call (voice)
- CONSULTATION HOLD: the user is talking to the original the party and consulting is on hold (voice)
- ESTABLISHED HOLD: call held by another party (voice)

Hardware requirements

This feature requires that a Digital Line Module (DLM) be connected between the M3000 sets and the LGC/LTC.

The LGC requires the following new XPM memory cards:

- NT6X47AB MP Memory Card
- NT6X46AB SP Memory Card
- two NT6X45AC Processor Cards

Limitations and restrictions

The following limitations and restrictions apply to M3000 Call Progress Indication II:

- the Speed Calling soft key
- the Call Park soft key
- the Call Forwarding soft key
- The time and date display is not supported. The time is displayed in the right hand corner of the screen, but it is not updated to the correct time.

AD0465

M3000 call progress indication II (end)

- The Ring again is supported for calls to busy lines, but not for calls to busy trunks.
- the Message Waiting soft key

Interactions

M3000 Call Progress Indication II has no functionality interactions.

Datafill

M3000 Call Progress Indication II does not affect data schema tables or office parameters.

Service Orders

M3000 Call Progress Indication II does not affect SERVORD.

Operational measurements

M3000 Call Progress Indication II does not affect operational measurements.

Logs

M3000 Call Progress Indication II does not affect logs.

User interface

M3000 Call Progress Indication II does not change the user interface.

Billing

M3000 Call Progress Indication II does not affect billing.

AD0468**M3000 and Delta II service orders**

Functionality name

M3000 and Delta II Service Orders

Description

This feature expands the MSL-100 Service Order capabilities for the Meridian Integrated Voice and Data (IVD) by adding the Meridian 3000 and 2317 touch sets to Service Orders.

This feature provides users with an efficient method of maintaining the Meridian 3000 and 2317 touch sets within the database.

Commands are provided to:

- add and delete subscribers in the database
- add or delete options for subscribers
- suspend or restore service
- query the information on a subscriber

In addition, this feature adds the M3000 and M2317 sets to the Database Line Query Functions.

Service Order Capabilities

Service Orders provide users with a means of performing operations such as the adding or deleting of subscriber entries, the adding or deleting of options such as Call Forwarding (CFW), or the suspension or restoration of subscriber services.

The Service Order System is implemented as an input and verification system handling various phone types, including the Meridian IVD sets. Each Service Order has a Service Order number associated with it. All the information required in the Service Order is entered only once with the data being distributed to the required tables after passing extensive verification. The Service Order System is implemented as an input and verification system handling various phone types, including the Meridian IVD sets. Each Service Order has a Service Order number associated with it. All the information required in the Service Order is entered only once with the data being distributed to the required tables after passing extensive verification.

AD0468

M3000 and Delta II service orders (continued)

Service Orders are used to:

- establish/discontinue service
- assign/cancel Directory Numbers (DN), Line Options and features
- establish/delete hunt groups

In addition to Service Orders, information on the subscriber line may also be obtained using the Database Line Queries available to the user.

These line queries include:

- QHU
- QHA
- QHASU
- QLOAD
- QLENWRK
- QLEN
- QDNSU
- QDNWRK
- QDN

Meridian 3000 Set

The Meridian 3000 series voice set provides a standard feature handset, a speaker for voice and tone alerting, and a touch sensitive screen with no hard keys. All telephone operations are performed by touching the soft keys on the screen. The set has a handsfree unit and may contain the Meridian Asynchronous Data Option (MADO). The MADO is used for data transmission and consists of a single printed circuit board that mounts within the housing of the Meridian 3000 series voice set.

Meridian 2317 Set

The Meridian M2317 set, also known as the Delta II set, provides a standard feature headset, a two-line display, 11 hard keys, a handsfree key for handsfree capability and five soft keys. The set's 11 hard keys function the same as the M2000 series set.

AD0468**M3000 and Delta II service orders** (continued)

Hardware requirements

To configure the Meridian 2000 and 3000 terminals on an MSL-100, use the Digital Line Module (DLM). The DLM consists of the following cards:

- NT6X53 Power Card
- NT6X51 DLM Processor Card
- NT6X52 Digroup Control Card
- NT8X49 Parallel-Serial Time Switch (PSTS) Processor Card
- NT8X46 PSTS Card 1 to 5 NT8X47 Digital Port Cards (DPCs)
- 1 to 5 NT8X47 Digital Port Cards (DPCs)

The Meridian 2000 and 3000 series sets are connected to DPC's (NT8X47 card) with a maximum of 16 voice sets per card (each of which may be equipped with an optional data adapter).

Limitations and restrictions

The command PLP (plug up—place on trouble intercept) is not used for the M2317 sets, other IVD sets, or electronic business sets (p-phones).

The features available on the M3000 and the M2317 sets are consistent with those available on other Meridian IVD sets, with the following exceptions:

- Three way calling (3WC): The M3000 set has 6 port conference calling available instead of 3WC.
- Malicious Call Hold (MCH): This feature is not available in the soft keys of the M3000 set but is assigned as a code access feature.
- Automatic Dialing (AUD): This feature is not available in the soft keys of the M3000 set. Instead, the directory of the M3000 set takes the place of the AUD.

When assigning Line Equipment Numbers (LENs) to the DLM, the user is restricted to entering only 0 to 9.

Interactions

This feature is an extension of existing p-phone/Meridian IVD Service Orders; thus the operation of Service Orders for p-phones, data-units, M5000 series (repackaged p-phone), and the Meridian IVD M2000 series sets are not affected

AD0468

M3000 and Delta II service orders (end)

Datafill

M3000 and Delta II Service Orders does not affect data schema tables or office parameters.

Service Orders

M3000 and Delta II Service Orders does not affect SERVORD.

Operational measurements

M3000 and Delta II Service Orders does not affect operational measurements.

Logs

M3000 and Delta II Service Orders does not affect logs.

User interface

M3000 and Delta II Service Orders does not change the user interface.

Billing

M3000 and Delta II Service Orders does not affect billing.

AD0469
RMM for remote DLM

Functionality name

RMM for Remote DLM

Description

This feature provides the necessary software to support the Remote Maintenance Module (RMM) when configured within an RDLM.

The standard 6X13 RMM is a single shelf peripheral that provides the same operational support to the Remote Office as the Maintenance Trunk Module (MTM) provides to the Central Office. The RMM for RDLM (7X53) is co-located with the RDLM and uses DS-30A links for communication with the RDLM. Although the RMM is a peripheral, it is located within the RDLM Remote Interface and Maintenance module (RIM) shelf, which it shares with the LCC cards and the DS1 interface cards, known as the Host Interface Equipment (HIE). The RMM is a P-side node to the RDLM.

Two DS-30A links are used to connect the RMM to an RDLM. Each DS-30A link consists of 32 channels: channel 0 is used for messaging; channels 1-15 and 17-32 carry PCM information; and channel 16 is not used. In the RDLM configuration, the RMM occupies only one half of a shelf; the Host Interface Equipment (HIE) occupies the other half. This arrangement is called the Remote Interface and Maintenance (RIM) shelf.

The following commands are available to perform maintenance functions on the Remote Maintenance Module:

- BSY
- RTS
- POST
- NEXT
- LOADPM
- QUERYPM
- TRNSL
- OFFL
- TST
- DISP

The following figure shows the RIM shelf configuration.

AD0469**RMM for remote DLM (continued)****RIM shelf layout and card complement**

2 X 0 9 A A	1 X 9 0 A A	2 X 9 6 A A		2 X 5 7 A A	0 X 1 0 A A	2 X 5 9 A A	6 X 7 4 A B		6 X 4 7 A B	6 X 4 5 A F	6 X 7 5 A A	6 X 7 3 A A	6 X 7 3 A A	6 X 5 0 A A	6 X 5 0 A A	6 X 5 0 A A	2 X 7 0 A A	2 X 7 0 A A
PWR CON	T S G	P L M	S P A R E	S D C	M S D C	C A T C	R M M C	S P A R E	E S A M	E S A P	E T C	L C C	L C C	D S 1	D S 1	D S 1	PWR CON	PWR CON
5 -5 12 -15 24																	5 -5 12 -12	5 -5 12 -12
0 1	0 3	0 4	0 5	0 6	0 7	0 8	0 9	1 0	1 1	1 2	1 3	1 4	1 5	1 6	1 7	1 8	1 9	2 1

<u>Slot</u>	<u>Abbreviation</u>	<u>Description</u>
* 01	PWR CON	Power Converter
* 03	TSG	Test Signal Generator Card
* 04	PLM	PCM Level Meter Card
05	SPARE	Spare Maintenance Slot
* 06	SDC	Signal Distribution Card
* 07	MSDC	Miscellaneous Scan Detector Card
* 08	CATC	Coder/Decoder (CODEC) and Tone Card
* 09	RMMC	RMM Control Card (8085 up)
10	SPARE	Spare Maintenance Slot
11	ESAM	Emergency Stand Alone (ESA) Memory Card
12	ESAP	ESA Processor (68000 up)
13	ETC	ESA Tone and Clock Card
14–15	LCC	Link Control Card
16–18	DS1	DS-1 Interface Card (Card 2 is optional)
19	PWR CON	Power Converter
21	PWR CON	Power Converter

Note 1: The asterisk (*) indicates the required cards for the RMM in the RDLM configuration.

Note 2: The ESA cards (slots 11–13) are shown but not required for the RMM with the RDLM.

AD0469**RMM for remote DLM** (continued)**Hardware requirements**

The RIM shelf has only 10 slots for the RMM (instead of the 20 slots provided in the standard RMM) and 12 slots for the HIE (instead of the 25 slots provided in the RLCM configuration).

The following table describes the required RMM cards.

Required RMM cards for RDLM

PEC	Name	Description
NT2X09AA	Power Converter	Provides +5V, -5V, +12V, -15V, and +24V required by shelf
NT6X74AB	RMM Control Card	Provides processor, memory, and I/O functions
NT1X90AA	Test Signal Generator Card	Provides programmable, dial-up test functions and internal diagnostic trunk test signals for DMS-100 equipment (required for Transmission Test Trunk [TTT])
NT2X96AA	PCM Level Meter Card	Contains circuits for measuring the level and frequency of PCM samples representing VF or tones (required for TTT)
NT0X10AA	Miscellaneous Scan Detector Card	Used to determine the state of a variety of DMS-100 equipment (for example, alarm conditions, blown fuse, and door open)
NT2X57AA	Signal Distribution Card	Lower-output rated version of NT2X55, which provides interface between DMS-100 and external relay-controlled equipment
NT2X59AA	Coder/Decoder (CODEC) and Tone Card	Provides ROM-based tone generation and conversion between VF signals and PCM

This feature requires an RDLM complete with 7X53AA RIM shelf. The RIM shelf must contain the following cards:

- 2X09AA Power Converter
- 6X74AB RMM Control Card (RMMC)
- 0X10AA Miscellaneous Scan and Detect Card (MSDC)
- 2X57AA Signal Distribution Card (SDC)

AD0469

RMM for remote DLM (end)

There must also be two 6X73AA Link Control Cards (LCCs) and two or three 6X50AA DS-1 interface cards in the RIM shelf.

Limitations and restrictions

The RIM shelf has only ten slots for the RMM.

Interactions

RMM for Remote DLM has no functionality interactions.

Datafill

Changes were made to table RMMINV to datafill the RMM in the RDLM configuration.

Service Orders

RMM for Remote DLM does not affect SERVORD.

Operational measurements

Existing peripheral maintenance OMs were used. No new OMs were created for this feature.

Logs

Existing diagnostic and maintenance logs are used, but now include references to the RDLM and the new configuration of cards in the RIM shelf. No new logs were created.

User interface

Existing commands at the RMM MAP level are used as they were previously applied to RMMs for RLCMs. No new MAP commands or MAP levels were created.

Billing

RMM for Remote DLM does not affect billing.

AD0640
RSC-DLM basic

Functionality name

RSC-DLM Basic

Description

The Remote Switching Center with Digital Line Module (RSC-DLM) provides the facilities for interfacing with a large number of digital lines, analog lines, and digital trunks at a remote location. The RSC-DLM also handles “remote-off-remote” connection to other remote sites. The RSC-DLM enables the functionality of the Line Trunk Controller (LTC) and associated Peripheral Modules (PMs) to be transferred to a remote site. The maximum distance between the office and the most distant PM hosted by the RSC-DLM is 150 miles.

The RSC-DLM is essentially a Remote Cluster Controller (RCC) with the added capability of interfacing to the new DLM and the Remote DLM (RDLM). This enhancement allows both digital and analog Line Concentrating Devices (LCDs) to be part of an RSC.

The following are the major functions of this feature:

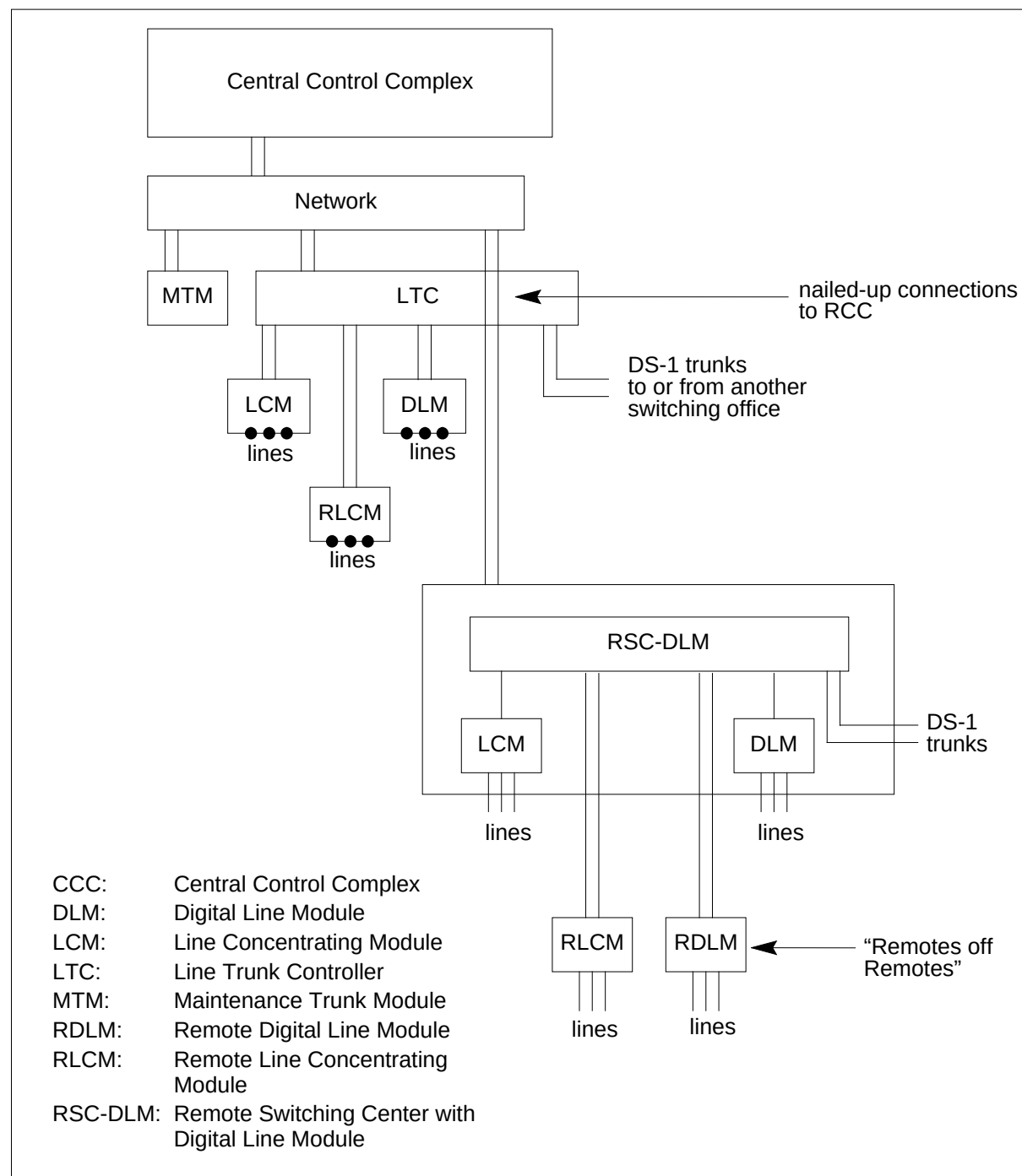
- to support the same maintenance, diagnostics, and call processing features that are available on the DLM
- to use the current single-shelf Integrated Voice and Data (IVD) DLM peripheral without any hardware modifications
- to support 160 IVD station sets per DLM, each with voice and 64 kbit/s physical data channel. The maximum data rate for the Meridian Asynchronous Data Option (MADO) is 19.2 kbit/s.
- to provide higher traffic capacity for data calls—non-blocking in purely voice installations
- to provide software to support the IVD sets on the DLMs and RDLMs that are connected to the RCC, including call processing, maintenance and diagnostics, and table control. This feature allows DLMs and RDLMs to be added to the RCC and for the RCC to handle IVD lines.

The following figure illustrates the CCC/RSC-DLM configuration.

AD0640

RSC-DLM basic (continued)

CCC/RSC-DLM configuration overview



AD0640**RSC-DLM basic** (continued)

System description

The following section describes the major units located at the RSC-DLM.

RCC

The RCC provides a master controller for all units at the RSC and is controlled by the host LTC. The RSC is a dual-shelf PM. It is similar in configuration to the LTC and uses many of the same components. The RCC shelves are referred to as Remote Controller Arrays (RCA). The RCC provides an interface through from 3 up to 16 DS-1 links to matching DS-1 interfaces in the host office LTC. Within the RSC, the RCC provides up to 20 ports that can be configured to provide various combinations of DS-30A and DS-1 links.

LCM/DLM

The Line Concentrating Module (LCM) and the Digital Line Module (DLM) at an RSC are identical to the LCM and DLM at the host office. Up to 9 LCMs or DLMs, using 2 DS-30A links each, can be provisioned using 18 of the 20 DS-30A ports that the RCC provides. This leaves two ports available for RMMs.

The RCC has control of up to 5760 (9 x 640) remote subscriber lines if configured using only LCMs. The RCC has control of up to 2880 (9 x 320) remote subscriber channels (voice and data) if configured using only DLMs. In a smaller configuration where 6 LCMs are supported (each using 3 DS-30A links), the RCC controls up to 3840 lines. If 6 DLMs are supported (each also using 3 DS-30A links), the RCC controls 1980 channels of both voice and data.

Note: The RSC can be configured to have a mix of both LCMs and DLMs.

Remote-off-remote equipment

If all RCC ports are not used for DS-30A links, from 2 to 20 ports can be provided with DS-1 interfaces and connected to DS-1 transmission facilities to another remote site.

Note: The RCC has 20 P-side ports, and each port can be provisioned with either a DS-30A link or a DS-1 link. The RCC -P-side can be provisioned with all DS-30A links, all DS-1 links, or a combination of both.

Equipment at the remote-off-remote site can consist of an RLCM or RDLM located inside a building. The RLCM interfaces with up to 640 local analog lines. The RDLM interfaces with up to 320 local digital channels (voice and data). This allows subscribers connected to RLCMs or RDLMs to share DS-1 facilities to the host office with subscribers connected to the RSC equipment.

AD0640

RSC-DLM basic (continued)

Remote digital trunking

A maximum of 20 DS-1 equipped P-side ports on the RCC can be assigned to interface with DS-1 digital trunk groups. However, if all 20 P-side ports are used for trunking, the RCC cannot be equipped with any DLMs, LCM, or RMMs.

Remote digital trunks only handle trunk traffic originating from or terminating on subscriber lines connected to an LCM/DLM or an RLCM/RDLM controlled by the same RCC.

Hardware requirements

This feature requires the use of an NT7X49AA DLM or RDLM attached to the P-side of an NT6X12AB RCC.

Limitations and restrictions

The following limitations and restrictions apply to RSC-DLM Basic:

- using the RCC RMM for IVD lines
- Emergency Stand-Alone (ESA) capability for IVD lines
- IVD line - trunk intraswitching (normal mode)
- IVD line - trunk intraswitching (ESA mode)
- RCC - RCC Interswitching (normal mode)
- RCC - RCC Interswitching (ESA mode)
- Digital Recorded Announcement Messages (DRAMs)
- warm entry or exit of ESA for IVD lines

Interactions

RSC-DLM Basic has no functionality interactions.

Datafill

To datafill a DLM as associated with an RCC, table DLMINV (DLM Inventory) must be modified to accept an RCC as a valid C-side PM.

There are two possible configurations for DLMs associated with RCCs. A DLM can be co-located with an RCC, or it can be remote off of an RCC. The difference is reflected by the datafill entry in Table DLMINV. When a DLM is co-located with an RCC, the DLMSELECTOR field has the value "HDLM". This entry reflects the fact that the DLM is located at the same site as the C-side peripheral (the RCC), and that the DLM C-side links are DS-30A links. When

AD0640
RSC-DLM basic (end)

a DLM is remote off of an RCC, the DLMSELECTOR field has the value "RDLM". This entry reflects the fact that the DLM is remote to the C-side peripheral, and that the DLM C-side links are DS-1 links.

Service Orders

RSC-DLM Basic does not affect SERVORD.

Operational measurements

RSC-DLM Basic does not affect operational measurements.

Logs

RSC-DLM Basic does not affect logs.

User interface

The only changes visible to the user in the man-machine interface are at the DLM and RCC levels at the MAP workstation. When the TRNSL C command is issued at the DLM level and the DLM posted is attached to an RCC, then the name of the RCC is displayed, along with the link numbers and link states. When the TRNSL P command is issued at the RCC level and the RCC posted has one or more DLMs attached to it, then the name of the DLMs are displayed, along with the link numbers and link states.

Billing

RSC-DLM Basic does not affect billing.

AD0641

RDLM ESA

Functionality name

RDLM ESA

Description

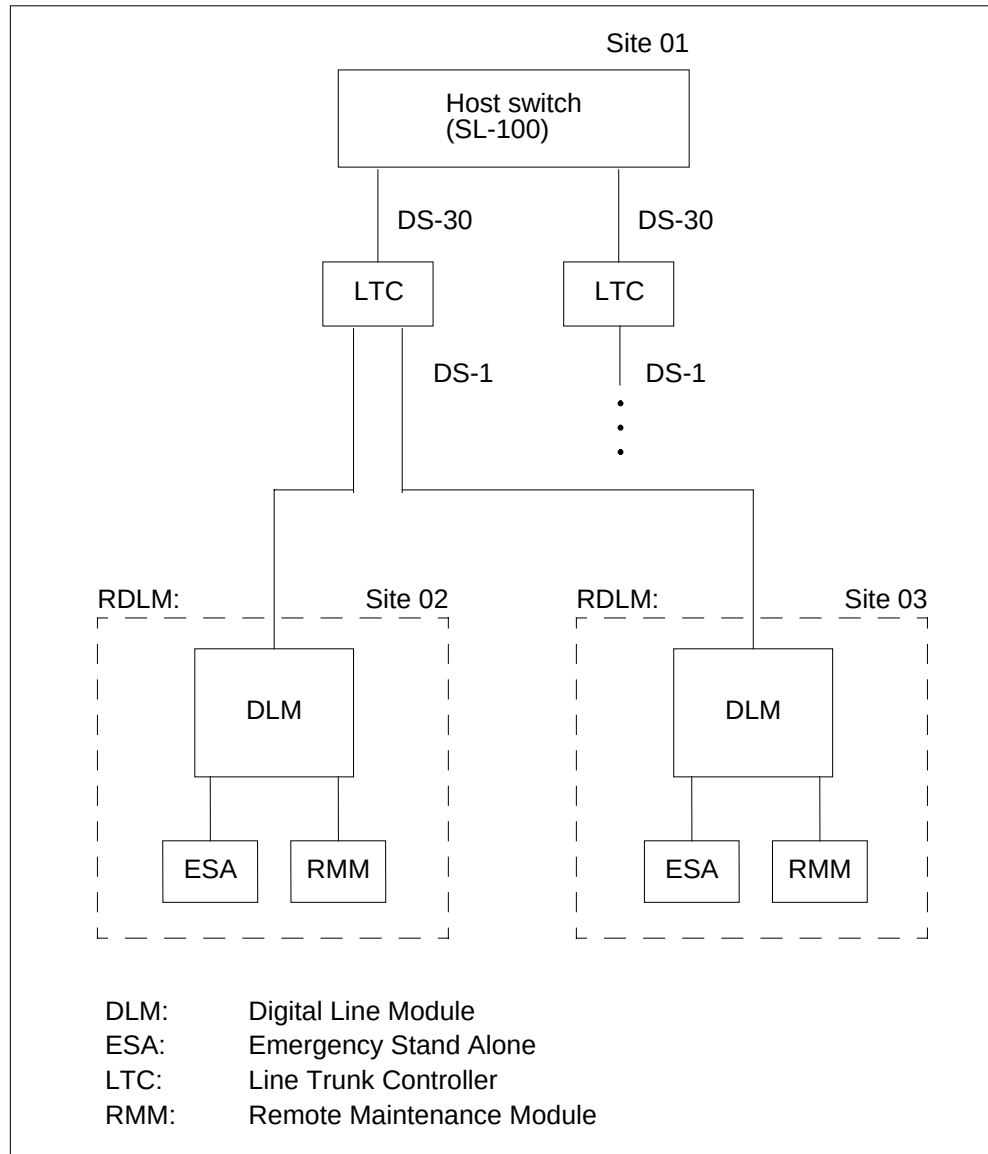
Emergency Stand-Alone (ESA) is an emergency service option of the Remote Digital Line Module (RDLM) that provides limited call processing capabilities in the event of loss of communications with the host.

The RDLM is a Digital Line Module (DLM) peripheral remotely connected to a host Line and Trunk Controller (LTC) using DS-1 links. The RDLM is capable of handling up to a maximum of 320 digital lines. The ESA functions are provided by additional software and hardware.

The following figure shows an overview of the RDLM ESA system.

AD0641 RDLM ESA (continued)

RDLM ESA system diagram



Intraswitching in ESA

This feature provides intraswitching during ESA. Intraswitching provides the capability of switching calls at a remote location without requiring transmission back to the host. For example, when a call is originated at an RDLM, a check is made to see if both parties reside on the same node. If they do, intraswitching calling is attempted in the RDLM.

AD0641**RDLM ESA** (continued)

The number of intraswitched calls supported during ESA is bound to the number of designated intracalling channels on the RDLM and varies depending on the number of DS-1 links used for host communication. Each call requires two channels.

Number of host links	Number of ESA inter calls possible	Number of ESA intra calls possible	Total number of ESA calls possible
6	15	36	51
5	27	48	75
4	39	60	99
3	51	72	123
2	63	84	147

RDLM ESA features and services

The following section describes line types and services available for the RDLM ESA.

Line types

IVD (Integrated Voice and Data) sets are the only sets supported on a DLM. IVD sets are considered to be IBN (Integrated Business Network) lines. The following IBN line types are supported:

- IVD—treated like 2500 sets with the Primary Directory Number (PDN) as the directory number. Only the PDN and Release keys are supported.
- MADO—DN only, no modem pooling in ESA

Services

The following services are available while in ESA:

- Hunt group services—Multiline Hunt Group (MLH), Distributed Line Hunt Group (DLH), and Directory Number Hunt Group (DNH) with sequential line hunting are supported. DLH is treated the same as MLH.

AD0641
RDLM ESA (continued)

There is no circular hunting for DNH. The system allows a maximum of 26 hunt groups and 512 hunt group members per RDLM.

- Basic dialing—A subscriber can make calls to other subscribers serviced within the same RDLM.
- Automatic Lines (AUL) or Manual Lines (MAN) with maximum 15-digit DN—AULs must be datafilled by service orders. The system allows 63 AULs per RDLM.

The following IBN services are provided:

- maximum of 320 members in a customer group
- maximum of 32 customer groups per RDLM
- station to station dialing for a one- to six-digit extension number
- denied incoming call for a station
- direct outward dialing with or without second dial tone for termination to another customer group within the same RDLM
- inter-customer group calling by the same dialing plan (except lines with denied incoming option)
- primary numbers of the Multiple Appearance Directory Number (MADN) groups are treated as regular IBN lines
- coded ringing

ESA-ENTRY

ESA-ENTRY is the taking of call processing control from the Central Control (CC) by a peripheral, should the following conditions occur:

- The links from a peripheral to the CC become unusable.
- Communication between a peripheral and the CC is broken.

There are two ESA-ENTRY options: warm entry and cold entry. On warm entry, all calls that are intraswitched and at talking state are preserved. For cold entry, all calls are dropped.

There are two ESA-ENTRY triggers:

- The RDLM loop-around message audit has detected loss of communications of the CC.
- The RDLM software discovers that one or both active RDLM units have broken DS-1 C-side message links. This is detected by either local alarms on the link or a major DMSX messaging failure.

AD0641

RDLM ESA (continued)

These triggers are controlled by the office parameters RLCM_ESAENTRY_BADCSIDE and RLCM_ESAENTRY_BADLINK respectively. Both RLCMs and RDLMs use these parameters.

ESA-EXIT

ESA-EXIT refers to the return of control to the CC when communications are re-established. When the RDLM host communication is restored, the ESA mode goes under CC control. The CC takes back the call processing responsibility. There are two exit options: warm exit and cold exit. On warm exits, all stable calls that are intraswitched and at talking state are preserved. For cold exits, all calls are dropped.

ESA-EXIT is triggered by the restoration of C-side communications. When the host DS-1 links and CC communications are restored, CC is able to send an ESA-EXIT message to the ESA processor.

Enabling and disabling ESA

To control the enabling and disabling of the ESA capability, the ESA processor can be either put in-service, which allows the RDLM to enter ESA if a failure is detected, or made ManB, which has the effect of disabling the ESA ability.

Hardware requirements

ESA for RDLM requires additional hardware. This hardware resides in the Remote Interface and Maintenance Module (RIM) shelf of the RDLM and consists of the following cards:

- XPM Processor Card (NT6X45)
- ESA Clock and Tone Card (NT6X75)
- XPM MP Memory Card (NT6X47)

LTC requirements

The Host LTC to the RDLM with ESA must be equipped with the new messaging card (NT6X69) for communication with the ESA processor.

RMM requirements

A Remote Maintenance Module (RMM) must be equipped with the RDLM frame. This is required to provide diagnostics to the ESA processor while in ESA.

AD0641
RDLM ESA (continued)

For the RMM, five circuit cards are required:

- RMM Control Card (NT6X74)
- Miscellaneous Scan Detector Card (NT0X10)
- Signal Distribution Card (NT2X57)
- TTT - PCM Level Meter Card (NT2X96)
- TTT - Test Signal Generator Card (NT1X90)
- Power Converter Card (NT2X09)

Limitations and restrictions

The following limitations and restrictions apply to RDLM ESA:

- The ESA processor is not able to resume ESA call processing following a fatal trap, as is the case with XPMs. However, non-fatal traps are handled by a “trap-handler,” which allows the ESA processor to continue call processing in ESA.
- All calls are dropped when entering or exiting from ESA.

Interactions

This feature requires feature AD0467, RMM for RDLM.

Datafill

While in ESA, some special numbers, such as 411, 911 or IBN dial plans, require special translations. The ESA prefix translation table, ESAPXLA, stores the special translation data for POTS (Plain Ordinary Telephone Service) lines on an RLCM and IBN lines on an RLCM or RDLM. However, for IBN lines table CUSTHEAD must also be modified to link the ESAPXLA data to customer groups.

For IBN customer groups, up to eight special numbers per prefix translator name are allowed per RLCM or RDLM.

Service Orders

RDLM ESA does not affect SERVORD.

Operational measurements

Because there is no communication between the RDLM and the CC during ESA, Opera Measurements for ESA calls cannot be collected and output using standard means. For this reason, the RDLM pegs a limited number of call processing OMs while in ESA.

AD0641

RDLM ESA (end)

They are as follows:

- origination attempts
- termination attempts
- calls completed
- originations blocked due to lack of resources
- terminations blocked due to lack of resources
- lines taken out of service due to excessive errors
- translation errors

These OM's are sent to the CC and printed as a PM171 log after ESA-EXIT. The maximum value of each OM counter is 32,766.

Logs

RDLM ESA does not affect logs.

User interface

During ESA-EXIT status flags appear on the MAP display, indicating ESA-EXIT time-out countdown and ESA-EXIT. ESA-EXIT has no effect on existing commands and does not add any new ones. When the RTS sequence enters the ESA-EXIT portion of the RTS process, the ESA-EXIT message appears on the unit overseeing the exit procedure. The mate unit runs a lockout task to prevent other maintenance from occurring during the exit. If the ESA requires a timeout, the countdown time remaining is shown in the load area of the unit overseeing the exit.

After ESA-EXIT, an ESA OM log is printed to confirm that the RDLM has entered and exited ESA.

The main ESA software has an XPM monitor interface resident in its ESA processor that allows examination of the ESA internal software states, data, and entry and exit initiation from the monitor. To enter the ESA monitor level, type *ESA* from the main monitor menu.

Billing

RDLM ESA does not affect billing.

AD0732**M3000 screen updates and feature calling**

Functionality name

M3000 Screen Updates and Feature Calling

Description

This feature is the third phase of the M3000 Call Progress Indication (CPI), which supports the following M3000 functions:

- Speed Calling Programming/Usage
- Call Park and Retrieval
- Call Forward Programming/Usage
- Time and Date Display
- Call Back Queuing with Ring Again Capability
- Message Waiting

Speed Call Programming and Usage

The user programs either Speed Call Short (SCS) or Speed Call Long (SCL). (A user assigned Speed Call User (SCU) is only able to use numbers from their speed call user list.) To program a Speed Call entry:

- Touch the TOUCH PROFILE softkey, and the screen is updated to display PROFILE features.
- Touch the CODE CALL LIST softkey, and the screen is updated to the local speed call screen.
- Touch the PROGRAM CODE CALL softkey, and enter the Speed Call code followed by a number. Enter OK.
- Enter the code, and number (digits are echoed), then OK. The programming is complete and the digits are sent to the switch. The echoed digits are cleared and the screen is ready for another entry.
- Select the PROGRAM CODE CALL softkey, and enter another entry.
- Depress the EXIT key, and the screen returns to the IDLE state.

AD0732

M3000 screen updates and feature calling (continued)

Call Park and Retrieval

The user parks a call once it is ESTABLISHED (talking). To park a call:

- Touch the PARK softkey. The call is parked against the DN of the station.
- Touch the PARK key, and the screen is updated to the local call park screen with the system ID displayed.
- Verify that the call is parked. This is necessary to inform the user of the identification number to dial when retrieving the call.

To retrieve a call once it is parked:

- Select a line and obtain a dialtone.
- Dial the Special Service Prefix (SSP) and Parked Call Access code ('72') followed by the identification number assigned to the parked call.

Call Forward Programming/Usage

Call Forwarding allows the user to program a number to forward to, as well as cancel, from an IDLE state. To Call Forward a call:

- Touch the FORWARD softkey, and enter a number, then OK.
- Enter a number (digits are echoed), then OK. Call forwarding is complete, and the numbers are sent to the switch.

The user programs Cancel Call Forwarding:

- Touch the FORWARD softkey, and the screen displays the number set where the call is forwarded. The screen prompts to cancel call forwarding.
- Touch CANCEL FORWARDING to cancel the call. The screen returns to the IDLE state, and displays a message CALLS ARE NOT FORWARDED.

Time and Date

The time and date appears in the upper right hand corner of the screen and is updated upon an RTS of the set as well as during the feature lamp audit process.

Call Back Queuing (CBQ) with Ring Again (RAG)

RAG is activated when a user encounters a busy line or receives an Expensive Route Warning Tone (ERWT). The user selects the RAG key to make a CBQ request. If the request is legal, the RAG indicator appears on the bar line, and the DN returns to idle. If the keystroke is illegal, the keystroke is ignored. The request is allowed if the outgoing trunk group is an Integrated Business Line (IBN) Customer Group trunk group with CBQ allowed.

AD0732**M3000 screen updates and feature calling** (continued)

Message Waiting

Message waiting provides the user the ability to route/retrieve calls to/from a customer defined Message Center. When a message is waiting, the prompt line informs the user when the message arrives and an envelope appears next to the MESSAGE softkey.

To retrieve a call:

- Touch the MESSAGE softkey.
- Select a line and the Message Center DN appears on display. The Message Center answers and gives the messages.
- Release call, and MESSAGE indicator (envelope) goes away.

Hardware requirements

This feature requires an MSL-100 equipped with LGC, DLM, and Meridian Touch sets version 4.14 or greater.

Limitations and restrictions

This feature requires a DLM with BCS22 or greater firmware.

Interactions

M3000 Screen Updates and Feature Calling has no functionality interactions.

Datafill

M3000 Screen Updates and Feature Calling does not affect data schema tables or office parameters.

Service Orders

M3000 Screen Updates and Feature Calling does not affect SERVORD.

Operational measurements

M3000 Screen Updates and Feature Calling does not affect OMs.

Logs

M3000 Screen Updates and Feature Calling does not affect logs.

User interface

M3000 Screen Updates and Feature Calling does not change the user interface.

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M3000 screen updates and feature calling (end)

Billing

M3000 Screen Updates and Feature Calling does not affect billing.

AD0757

MMI Software Interface for Cabinetized Meridian SL-100

Functionality name

MMI Software Interface for Cabinetized Meridian SL-100

Description

Housing the Meridian SL-100 system into cabinets provides expanded capacity, more features, and greater functionality. This feature displays information on the enhanced line concentrating module (ELCM) to provide maintenance at the PM level of the MAP command interpreter (MAPCI).

Changes for the ELCM

The Meridian Cabinet Line Module (MCLM) contains two fully duplicated ELCMs. Each ELCM is eight line drawers, providing a 512 line card capacity. An ELCM is a repackaged standard line concentrating module (LCM). All four line drawers on each shelf are located on the left, leaving the control equipment on the right.

This feature performs the following.

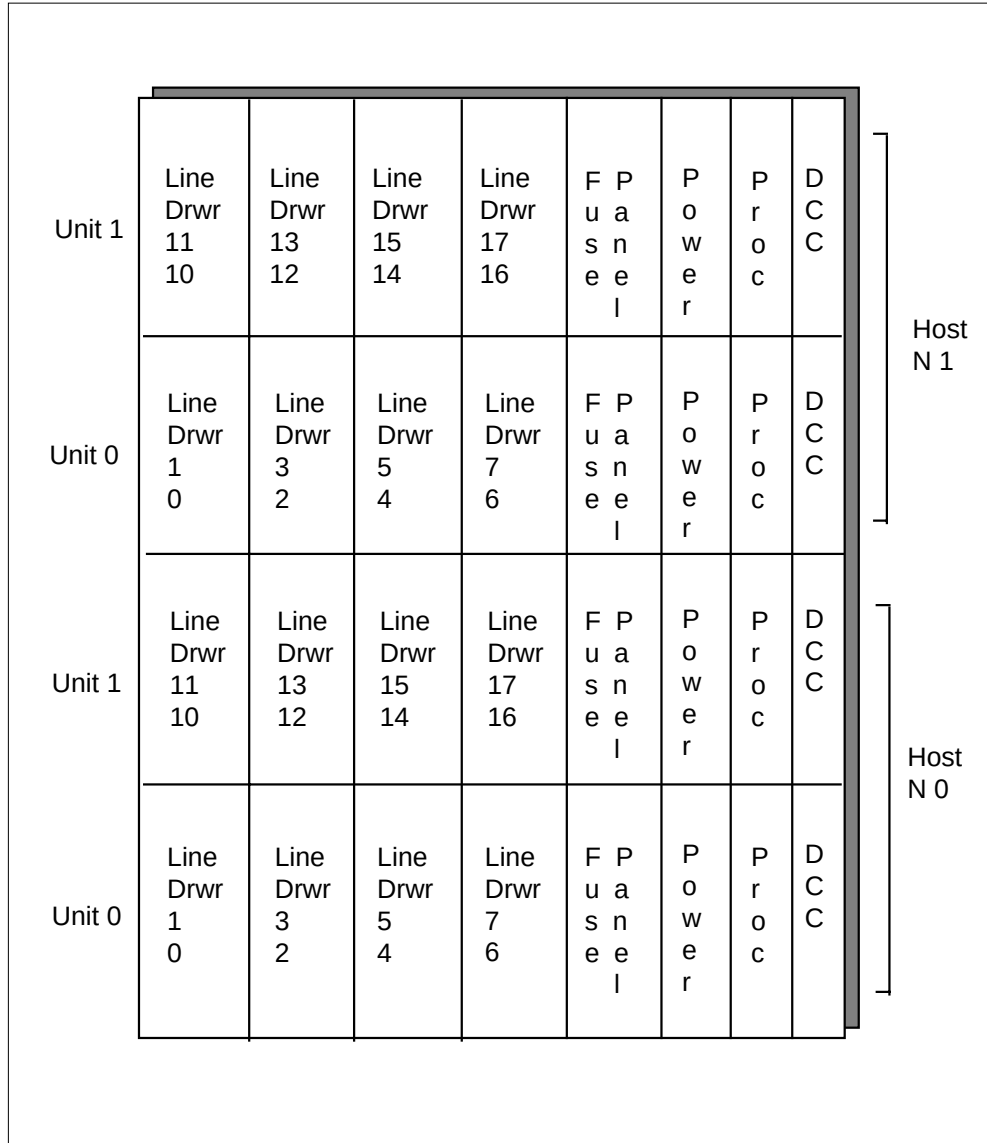
- blocks datafilling of lines in logical drawers 8, 9, 18, and 19 of an ELCM
- provides the changed card layout when displaying messages at the PM level of the MAPCI
- modifies the frametype display for Meridian cabinet switch configurations as follows:
 - MCDM is displayed as the frametype for the QueryPM command and bad card lists display for digital line modules (DLM)
 - Note:** The MCDM is manufacture discontinued (MD) and is replaced by the intelligent peripheral equipment column (IPEC).
 - MCLM is displayed as the frametype for the QueryPM command and bad card lists display for LCMs

The following figure illustrates the card layout for the MCLM.

AD0757

MMI Software Interface for Cabinetized Meridian SL-100 (continued)

Meridian cabinet line module (MCLM) card layout



Hardware requirements

The initial release of ELCM depends upon the following Meridian SL-100 cabinet hardware:

- Enhanced LCM Frame
- Enhanced LCM frame supervisory panel (FSP)
- Enhanced LCM Cooling Unit

AD0757

MMI Software Interface for Cabinetized Meridian SL-100 (continued)

- Enhanced LCM Processor Card
- Enhanced LCM Digroup Controller Card
- Enhanced LCM Bus Interface Card
- Enhanced LCM Line Drawer
- Enhanced LCM Mechanical Assembly
- Enhanced LCM Power Converter

Limitations and restrictions

MMI Software Interface for Cabinetized Meridian SL-100 has no limitations or restrictions.

Interactions

This feature is designed such that ELCMs can co-exist with LCMs and any other LOW-variant type.

Datafill

ELCM is added to the range LCMTYPE for table LCMINV.

Service Orders

MMI Software Interface for Cabinetized Meridian SL-100 does not affect SERVORD.

Operational measurements

Since this feature defines a new peripheral type, new OMs are defined for ELCMs. Functionally these OMs provide the same capability as OMs on LCMs.

Logs

All logs currently supported for LCMs are also supported for ELCMs. These logs provide identical functionality for ELCMs.

AD0757

MMI Software Interface for Cabinetized Meridian SL-100 (continued)

The following table lists the logs that are affected.

Logs

Log Name	ReportNumber	New, MOD deleted
PM	102	Modified
PM	103	Modified
PM	104	Modified
PM	105	Modified
PM	106	Modified
PM	107	Modified
PM	116	Modified
PM	117	Modified
PM	128	Modified
PM	179	Modified
PM	180	Modified
PM	181	Modified
IOAU	103	Modified
IOAU	106	Modified
IOAU	108	Modified

User interface

The following MAP display appears at the PM level in response to a request to POST an ELCM.

AD0757

MMI Software Interface for Cabinetized Meridian SL-100 (end)

```

3      2      3      4      5      6      7

123456789012345678901234567890123456789012345678901
7  ELCM HOST  2  0  ISTB      LINKS  OOS:  CSIDE  0
8  UNIT0:      Insv      Takeover      /RG:  0
9  UNIT1:      ManB MTCE      /RG:  0  Loading 12345
10
11 Drwr:      01      23  45  89  01  45  67  89  Stby 1 Insv
12              ..      ..      ..  --  ..      ..      ..  --
```

Note: The drawer positions 8, 9, 18, and 19 indicate a '-' for the permanently unequipped drawers on ELCMs.

Billing

MMI Software Interface for Cabinetized Meridian SL-100 does not affect billing.

AD0897

M2317 updates and feature interactions

Functionality name

M2317 Updates and Feature Interactions

Description

This feature provides the capability for the Meridian 2317 display set to provide basic call processing and the Terminal Diagnostics Test.

M2317 Digital Telephone Set

The Meridian 2317 digital telephone set offers the user simultaneous voice and data capabilities, and context dependent soft keys. The voice set consists of a standard feature handset, a speaker for voice and tone alerting, integrated handsfree/mute, 11 feature keys/indicators, an optional headset jack, and a two-line liquid crystal display for soft keys.

Call Progress is any information that describes the happenings of a call as it proceeds through the network to a destination. Information regarding alerting of the called party, answering by the called party, and routing to treatments, tones and announcements are examples of call progress. This information is used to update the soft key screen of the M2317 set.

M2317 Soft Key Features

The following soft keys are supported on the M2317 set:

M2317 soft keys (Sheet 1 of 2)

Feature	Screen Text
Call Forward	FORWARD
Call Park	PARK
Call Pickup	PICKUP
Call Transfer	TRANSFER
Conference 6	CONFER
Message Waiting	MESSAGE
Privacy Release	PRIVACY
Ring Again	RINGBAK
Speed Call/User, Controller	SPEED #

AD0897**M2317 updates and feature interactions** (continued)**M2317 soft keys (Sheet 2 of 2)**

Feature	Screen Text
Switch Parties	SWITCH
Complete Call Transfer	CONNECT
Complete Conference	CONNECT

The following keys are features that are controlled by the M2317 set:

Controlled features

Feature	
Last Number Redial	LAST#
Save the Number	SAVE#
Redial Saved Number	SAVED#
Reset Elapsed Time	TIMER

M2317 Call States

The M2317 supports the following call processing states for the M2317 set:

- IDLE: on-hook (voice and data)
- DIALTONE: ready to transmit dialed digits
- INTERCOM DIALTONE: ready to transmit digits for a group intercom call
- DIALING: transmitting dialed digits
- BUSY: called party off-hook
- REORDER: called party is unavailable
- RINGBACK: called party is ringing
- ERWT_CBQ: initial set of routes not available, user receives expensive route warning tone
- ESTABLISHED: connection made
- INTERCOM ESTABLISHED: connection established in a group intercom call
- CONF/XFER DIALTONE: special dialtone for CONF/XFER calls

AD0897

M2317 updates and feature interactions (continued)

- CONF/XFER DIALING: after special dialtone is heard, user is dialing digits on CONF/XFER call
- CONF/XFER BUSY: CONF/XFER called party is off-hook
- CONF/XFER REORDER: CONF/XFER called party is unavailable
- XFER RINGBACK: ringing called party for XFER
- CONFRINGBACK: ringing called party for CONF
- CONSULTATION: third party answers a CONF/XFER call
- CONSULTATION HOLD: user talks to original party and consulting party is on hold
- PRIVATE LINE DIALING: transmitting dialed digits on a private line
- PRIVATE LINE ESTABLISHED: connection made with a private line
- VOICE CALL/GROUP CALL ESTABLISHED: connection made using a voice (intercom key for MSL-100) or group call (preset conference for MSL-100) key

Call States and Corresponding Softkeys

The following call states and corresponding softkeys are supported for the M2317 set:

Call states and soft keys (Sheet 1 of 2)

Call States	Soft Keys
IDLE	RINGBAK, FORWARD, SPEED, HELD#, TIMER, MORE
DIALTONE	RINGBAK, SPEED#, MESSAGE, SAVED#, LAST#, PICKUP, MORE
INTERCOM	SAVED#, LAST#, PICKUP
INTERCOM DIALTONE	RINGBAK
PRIVATE LINE DIALING	SAVED#, LAST#
BUSY	RINGBAK, SAVE#
REORDER	No Soft Key
RINGBACK	SAVE#
ERWT_CBQ	RINGBAK, SAVE#

AD0897**M2317 updates and feature interactions** (continued)**Call states and soft keys (Sheet 2 of 2)**

Call States	Soft Keys
ESTABLISHED	CONFER, PARK, TIMER, SAVE#, TRANSFR, PRIVACY, MORE
INTERCOM ESTABLISHED	TRANSFR, CONFER, TIMER, SAVE#
PRIVATE LINE ESTABLISH	TIMER
VOICE/GROUP CALL ESTABLISHED	SPEED#, SAVED#, RINGBAK
CONF/XFER DIALTONE	No Soft Keys
CONF/XFER DIALING	RINGBAK, SAVE#
CONF/XFER BUSY	No Soft Keys
CONF/XFER REORDER	CONNECT, SAVE#
CONFERENCE RINGBACK	SAVE#
CONSULTATION	CONNECT, SWITCH
CONSULTATION HOLD	CONNECT, SWITCH

M2317 Terminal Diagnostics Program

The M2317 Terminal Diagnostics program, also known as the station ringer test (SRT), tests the hardware of the M2317 set. The operation of the set is verified by providing a visual and audio response to each key pressed. The test is started from the workstation to be tested.

Hardware requirements

M2317 Updates and Feature Interactions has no hardware requirements.

Limitations and restrictions

No terminations are allowed on any set other than IVD while testing is performed. To perform testing, all other DN keys are idle.

Interactions

M2317 Updates and Feature Interactions has no functionality interactions.

AD0897

M2317 updates and feature interactions (end)

Datafill

M2317 Updates and Feature Interactions does not affect data schema tables or office parameters.

Service Orders

M2317 Updates and Feature Interactions does not affect SERVORD.

Operational measurements

M2317 Updates and Feature Interactions does not affect operational measurements.

Logs

M2317 Updates and Feature Interactions does not affect logs.

User interface

M2317 Updates and Feature Interactions does not change the user interface.

Billing

M2317 Updates and Feature Interactions does not affect billing.

AD0898
DLM PM upgrade

Functionality name

DLM PM Upgrade

Description

This software feature provides enhancements to the PM maintenance for Digital Line Modules. The enhancements include:

- maintaining the Digital Port Card (DPC)
- providing more information displayed as a result of entering the QueryPM command from the DLM level of the MAP system
- enhancing the logs generated as a result of DLM state changes; using the format convention adopted for all other DMS peripherals
- updating the alarms immediately upon DLM state change

Digital Port Card Maintenance

Port card/drawer maintenance is looked at from two perspectives:

- maintaining a port card/drawer of the PM as separate entities, not including diagnostics
- enhancing diagnostics so that port card/drawer faults are distinguishable from faults affecting the entire unit of the PM

Port card maintenance is provided on a per port basis. Manual and system maintenance operates on DLM port cards within the bounds of the port card. The purpose of port card maintenance is to allow

- enhances diagnostics to help indicate problems on port cards before service is affected
- identifies faults occurring on working port cards easily
- corrects problems with a port card easily

Hardware requirements

DLM PM Upgrade has no hardware requirements.

AD0898

DLM PM upgrade (continued)

Limitations and restrictions

The following limitations and restrictions apply to DLM PM Upgrade:

- In order for Port Card Maintenance to work properly, a BCS25 software load or later is used in conjunction with BCS25 CC software load
- Tests are not performed on a port card before adding lines to it. Since the port card is not equipped until a line is datafilled, the datafill is added in table LNINV before the DLM equips the port card, after which testing is possible from the MAP system.
- Presently, manual port card operations are restricted to one port at a time.

Interactions

DLM PM Upgrade has no functionality interactions.

Datafill

DLM PM Upgrade does not affect data schema tables or office parameters.

Service Orders

DLM PM Upgrade does not affect SERVORD.

Operational measurements

No Operational Measurements (OM) are added by this feature. However, new registers are added to groups PM and PMTYP to indicate port card/drawer faults. These registers are PMDRFLT and PMDRERR for group PM and PMTDRFLT and PMTDREERR for group PMTYP. Usage counts for the number of port cards/drawers in the man-busy or system-busy state.

Logs

A PM181 log is used to indicate port card changes. The affected logs are:

- PM102
- PM103
- PM106
- PM107
- PM128

User interface

A new man machine interface is provided that allows the craftsperson to manually RTS, BSY, TST, or OFFL particular port cards.

AD0898

DLM PM upgrade (end)

Billing

DLM PM Upgrade does not affect billing.

AD0901

ESA REX test for RDLM

Functionality name

ESA REX Test for RDLM

Description

This feature implements Routine Exercising (REX) tests for DLMs. REX tests provide enhanced diagnostic capabilities by performing the following functions:

- periodically running Out-of-Service (OOS) tests on each DLM unit
- periodically running In-Service (InSv) tests on each DLM unit in both normal and takeover mode
- testing the ability of an RDLM to enter and exit Emergency Stand Alone (ESA) mode

REX tests for DLMs can be logically broken down into two areas:

- diagnostics run periodically by the system (DLM REX)
- tests related to the capability of an RDLM to successfully make the transition into and out of ESA mode (ESA REX)

The following sections explain these two aspects of REX tests, including how they relate to each other.

DLM REX tests

Diagnostics run by DLM REX tests include:

- OOS tests on each DLM unit
- InSv tests run on each DLM unit when mate unit is InSv
- InSv tests run on each DLM unit when mate unit is OOS

REX tests for Line Modules (LMs), Line Concentrating Modules (LCMs) including the LCM variants such as ISLM and ELM, and Digital Line Modules (DLMs) are controlled by office parameter LCDREX_CONTROL in table OFCVAR.

For DLMs, REX testing is performed during the specified interval one DLM at a time, in the order in which they were datafilled. It is sometimes not possible to exercise every DLM in the office during the REX interval. In this case, when the next interval starts, REX will pick up where it left off during the previous interval. That is, REX does not perform a second time on a particular DLM until it runs on all other DLMs in the office. No DLM are

AD0901**ESA REX test for RDLM (continued)**

exercised more than once during a given REX interval. The frequency of the routine exercise is determined by the length of the REX interval and the number of DLMS in the office; however, REX is performed, at most, once every 24 hours per DLM. It takes up to 15 minutes to perform REX testing on a DLM.

Note: DLM REX tests require that both units of the DLM are in service before they can run.

ESA REX tests

The ESA REX tests, performed on RDLMs only, test the ability of RDLM units to enter and exit ESA and their ability to send messages to the ESA processor while in ESA. This is done by temporarily placing one of the two RDLM units in ESA mode. The other unit continues call processing in takeover mode. Since this is not true ESA, it is referred to as Pseudo ESA.

Note: The ESA module must be in service before ESA REX tests can run.

The system automatically performs REX tests on the ESA module (once per week for each module). These tests are run immediately following the DLM REX test of an RDLM unit before the unit is returned to service.

ESA REX tests can also be invoked using a command available at the ESA level at the MAP terminal. The TST command at the ESA level has an optional parameter, REX. If omitted, the system runs the normal InSv or OOS tests (depending on the state of ESA). If the parameter is present, the system attempts to run REX tests. For this test to begin, both units of the parent RDLM must be in service. If this condition is not fulfilled, the test aborts with No Resources as a failure reason.

To prevent accidental attempts to perform maintenance on an RDLM unit in Pseudo ESA, the system runs an ESA Lockout task on the RDLM unit involved throughout the duration of the REX test.

The DLM MAP display is affected during the run of ESA REX tests. The REX test of an ESA module requires the use of a unit of the parent RDLM. During the REX test, the RDLM unit goes into System usy (SysB) state. ESA Lockout appears on the MAP display, next to the appropriate unit. This prevents the system (and craftspersons) from attempting to return the unit to service. When the REX test is complete, the RDLM unit is brought back into service and the same effect repeated with the other unit. This allows the ESA abilities of both units of the RDLM to be tested.

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ESA REX test for RDLM (continued)

There is no difference between the MAP display of the ESA module being tested and the MAP display normally seen for an ESA module under test.

Effect on calls

The takeover and takeback processes on the DLM have an affect on calls that are in the process of being connected. Calls that are already established can experience a 200-millisecond transition period. During this time, Pulse Code Modulation (PCM) is not sent or received from the telephone set. The first DLM unit is returned to service before the other unit is tested.

DLM REX steps

This section provides a step-by-step explanation of what happens in DLM REX tests once the tests have been invoked:

1. If both units of the DLM are InSv, unit 0 is made system busy (SysB); a PM128 state change log is generated with reason of REX in progress; the DLM node status is made InSv Trouble (ISTb) and a minor alarm is generated. If the QueryPM FLT command is entered with the DLM posted, the SysB reason of "REX in progress" is given for the SysB unit.
2. InSv diagnostics are run on unit 1 (which will be in takeover). If any diagnostics fail, the unit is placed ISTb and a PM181 log is generated. If this DLM is an RDLM, an attempt is made to perform ESA REX tests on unit 0. See the "ESA REX Steps" section for more information.
3. Unit 0 is returned to service; both OOS and InSv diagnostics are run. If OOS diagnostics fail, the unit is left SysB status and a major alarm is raised. A PM106 state change log is generated if the unit is returned successfully to service. If InSv diagnostics fail, the unit is placed ISTb state and a PM181 log is generated.
4. If unit 0 is returned to service successfully, steps 1 - 3 are repeated, except that unit 1 is placed OOS and InSv diagnostics are run on unit 0 in takeover mode.

ESA REX steps

This section provides a step-by-step explanation of what happens in ESA REX tests once the tests have been invoked:

1. Providing the ESA module is InSv, the messaging ability of each of the peripherals involved in the test (the ESA module itself and the DLM units) is tested. If each peripheral passes the messaging tests, the ESA module is placed in SysB status, and OOS tests are run on it. If the tests pass, the ESA module is brought back InSv. If any of these preliminary tests fail,

AD0901**ESA REX test for RDLM (continued)**

ESA REX tests are not run, and logs and MAP displays indicate the reason.

2. If the preliminary tests pass, the REX tests proceed to place a unit of the DLM in Pseudo ESA, leaving the mate unit InSv in takeover mode. In Pseudo ESA, messaging links for the unit of the DLM involved are switched from the host to the ESA module.
3. Once the unit of the DLM is in Pseudo ESA, the ESA processor exercises the DLM's ability to message to ESA under ESA conditions as well as other diagnostics. After all tests are complete, the DLM unit is taken out of Pseudo ESA.

When ESA REX tests are invoked from the MAP station, the ESA REX steps are invoked twice, once for each RDLM unit. If the REX tests of the first unit pass, the system proceeds to REX test the ESA module using the second unit of the DLM.

Hardware requirements

ESA REX Test for RDLM has no hardware requirements.

Limitations and restrictions

To perform REX tests, an RDLM must be equipped with an ESA and RMM module at the remote site.

Interactions

ESA REX Test for RDLM has no functionality interactions.

Datafill

ESA REX Test for RDLM does not affect data schema tables or office parameters.

Service Orders

ESA REX Test for RDLM does not affect SERVORD.

Operational measurements

No new OM groups or registers were added for this feature. However, the register listed below are pegged when the respective PMs are busied during the REX tests. The following groups have a set of registers allocated per PM:

- PM2USB - unit SysB (Group PM2)
- PM2MSBU - module SysB (Group PM2)

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ESA REX test for RDLM (end)

- PMUSBU - unit SysB (Group PM)
- PMSBP - module SysB (Group PM)

Group PMTYP has a set of registers allocated per PM type. This means there is one set for all DLMS and one set for all ESAs. This category includes the following:

- PMTUSU - unit SysB
- PMTSBP - module SysB

Logs

No new logs were created for this feature. However, existing logs contain new text.

User interface

The TST REX command at the ESA level of the MAP display is now implemented in the same manner as it is for LCMs.

Billing

ESA REX Test for RDLM does not affect billing.

AD0902**RSC-DLM ESA and intraswitching****Functionality name**

RSC-DLM ESA and Intraswitching

Description

This feature extends Emergency Stand Alone (ESA) and intraswitching capability in the Remote Switching Center (RSC) to handle Meridian Integrated Voice and Data (IVD) digital sets and Meridian Asynchronous Data Option (MADO) units attached to Digital Line Modules (DLMs) within the RSC.

ESA

The ESA function is an emergency service option of the Remote Cluster Controller (RCC) that provides call processing capabilities in the event of loss of communications with the host. The RCC is a peripheral remote connected to a host Line Trunk Controller (LTC) using DS-1 links. It is capable of handling up to nine DLMs, nine LCMs, or a combination of both.

Additional software running in the Central Controller (CC) and RCC provides the ESA functions. If a customer subscribes to the ESA option, it is included in the CC software. The ESA option can be enable or disabled through an entry in the RCCINV table.

This feature supports Meridian IVD sets and MADO units. Meridian IVD sets are treated like a 2500 set with Primary Directory number (PDN) as the directory number. Only the PDN and Release keys are supported. Other IVD set features are not supported. MADO units support PDN only, with no modem pooling.

The following Integrated Business Network (IBN) services are now provided to IVD lines in the ESA:

- basic dialing that allows a subscriber to make calls to other subscribers serviced within the RSC
- automatic lines (AUL) with a maximum 15-digit directory number. AULs must be datafilled by service orders. There are up to 255 AULs per RCC, plus 1 entry for the Plain Ordinary Telephone Service (POTS) operator that is needed for manual lines. Warm lines are not supported.
- hunt group services for POTS and IBN lines. The Multi-line Hunt Group (MLH), Distributed Hunt Group (DLH) and Directory Number Hunt group (DNH) with sequential line hunting are supported. DLH is treated the same as MLH. There is no circular hunting for DNH.

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RSC-DLM ESA and intraswitching (continued)

- routing of invalid termination or vacant termination to reorder
- a maximum of 2,880 members in a customer group (320 for each DLM)
- support for a maximum of 32 customer group for each subtending DLM
- up to eight prefix or special number of a maximum of 15 digits each for each customer group
- station-to-station dialing for one- to six-digit extension numbers
- denied incoming calls for a station
- direct outward dialing with or without second dial tone for termination to another customer group or POTS lines within the same RSC
- inter-customer group calling by the same dialing plan
- primary numbers of the Multiple Appearance Directory Number (MADN), which are treated like regular IBN lines

The following functions are not supported:

- Foreign exchange (FX) calls
- Line Overflow to a Route (LOR) and Line Overflow to a Directory Number (LOD). Line overflows are routed to busy tones.
- Remote Make Busy (RMB) and Stop Hunt
- Equal access features
- Meridian IVD set and MADO feature keys are not supported. No action will be taken when these keys are pressed.
- Station Message Detail Recording (SMDR)
- NCOS for IBN lines is not supported. This means that customer groups or lines have a restricted dialing plan that is common to all customer groups.
- The Multi-line Variety Package (MVP)
- Conference calls

Only the IBNXLA translation selector EXTN is supported for station-to-station dialing. If this selector is not datafilled, the POTS translation is used.

AD0902**RSC-DLM ESA and intraswitching** (continued)**Translations in ESA**

The following three tables are set up specifically for ESA:

- ESAPXLA
- ESAHNPA
- ESARTE

While in ESA mode, some special numbers, such as 411, 911, or IBN dial plans, require special translations. The ESA prefix translation table, ESAPXLA, stores the special translation data for POTS and IBN terminators. This table is also used for RDLM ESA and RLCM ESA support.

Table ESAHNPA stores translation data for trunks on an RSC while it is in ESA to facilitate NPA/ESN translation to trunks. It can contain a set of prefix trunk entries for each customer group on each RCC node.

Table ESARTE, the routing table, contains the trunk groups that are selected by the entries in the ESAPXLA and ESAHNPA. Table ESARTE must be datafilled before a route can be selected in either the ESAPXLA table or the ESAHNPA table. Each entry in the routing table identifies the ESA trunk group to terminate on, the number of digits to delete, and any digits to prefix. The reference to this route entry is contained in the ESAPXLA table or ESAHNPA table. A maximum of 15 digits can be outputted over a trunk. If more than the maximum digits are specified the excess digits are truncated. For IBN terminals, modify the CUSTHEAD table to link the ESAPXLA and ESAHNPA data to customer groups.

For IBN terminals, it is necessary to link the information in the ESAPXLA and ESAHNPA prefix tables to a particular customer group. To enable this, a new option called ESAPXLA is made available in the customer header table, CUSTHEAD. This allows the user to specify the prefix translator name associated with the customer group. More than one customer group can share a prefix translator name.

Restrictions on translations for POTS terminators are as follows:

- The ESAPXLA table contains up to 16 entries for each RSC.
- The ESAHNPA table contains up to 32 entries for each RSC.

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RSC-DLM ESA and intraswitching (continued)

Restrictions for translations for IBN customer groups are as follows:

- The ESAPXLA table contains up to eight entries per prefix translator name per RSC.
- The ESAHNPA table contains up to 16 entries per prefix translator name for each RSC.

ESATOOLS

The CC command ESATOOLS provides a set of tools related to ESA trunking capabilities. Using the facilities provided in ESATOOLS, it is possible to verify ESA static data before sending it to the RCC. The QUERYRCC subcommand of ESATOOLS indicates the supported and unsupported trunks on a particular RCC. The subcommand ESATRAVER displays the translation and routing data used for the specified call if it is made on the RCC while it was in ESA.

Intraswitching

Intraswitching is an optional feature that allows subscribers on the same remote peripheral to be connected without the DMS network handling the call once it is in progress. Software running in the CC and RCC provides intraswitching functions. Because both RCC units are equipped with the same version of the software, intraswitching capability exists in both RCC units. This option can be enabled or disabled through an entry in the RCCINV table.

The flow of an intraswitched call setup at the RCC is described in the steps below:

1. Subscriber A goes off-hook and dials subscriber B. A CC pathend, from the RSC to the CC, is seized for subscriber A.
2. To attempt to terminate the call from subscriber A at subscriber B, a CC pathend is obtained for subscriber B.
3. The DMS CC attempts to connect the call through a network connection. A check is made in Table RCCINV, field INTRASW, to determine if intraswitching is allowed at the RCC. If so, the DMS CC frees the pathends for both subscribers.
4. The LGC/LTC releases the associated C-side pathend. An intraswitched channel is allocated for the call.
5. The P-side pathends provide the necessary signaling tones to both subscribers.

AD0902**RSC-DLM ESA and intraswitching** (continued)

6. Subscriber B answers the call. The Pulse Code Modulation (PCM) connection is made over the intraswitching channel. The P-side pathend is released.
7. When either subscriber goes on-hook, an EXIT message is passed to the CC and the intraswitching channel is deallocated.

Note: This example assumes that both subscribers are on the same peripheral.

Hardware requirements

RSC-DLM ESA and Intraswitching has no hardware requirements.

Limitations and restrictions

RSC-DLM ESA and Intraswitching has no limitations or restrictions.

Interactions

RSC-DLM ESA and Intraswitching has no functionality interactions.

Datafill

The INTRASW field in table DLMINV is no longer forced to "N". If it is set to "Y", intraswitching is allowed for that RDLM node.

Service Orders

RSC-DLM ESA and Intraswitching does not affect SERVORD.

Operational measurements

The OM labeled RLCDIS is pegged during RDLM intraswitching activity, but no new OMs are created. RDLMs will have their own RLCDIS pegs for the following:

- total intraswitch call attempts
- unit intraswitch call attempts
- unit 1 intraswitch call attempts
- total intraswitch channel usage
- unit 0 intraswitch channel usage
- unit 1 intraswitch channel usage
- total blocked intraswitch attempts

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RSC-DLM ESA and intraswitching (end)

- unit 0 blocked intraswitch attempts
- unit 1 blocked intraswitch attempts

Each of the pegs for group RSCIS is pegged for calls involving lines on DLMs or RDLMs on a given RCC.

The following are some of the line-to-line configurations that the intraswitching feature supports:

- If both terminals are on the same RDLN with intraswitching on in both peripherals (RCC and RDLM), intraswitching is attempted on the RDLM first. In this instance, the RLCDIS call attempted peg, ISTOTATT, is increased, intraswitching channels traffic busy usage counter, ISTOTTRU, is increased for every slow sample the call is up, and RSCIS OMs are not pegged.
- If the call is blocked at the RLCD level, intraswitching is then attempted at the RCC level. In this case, RLCDIS intraswitched calls blocked peg, ISTOTBLK, is increased. For a call intraswitched within a unit, the blocking OM for that unit is also pegged. The RSCIS line-to-line intraswitch attempted peg, RSCISALL, is increased, and the intraswitching channel busy usage counter, RSCISCBU, is increased for every slow sample the call is up.
- If the call is also blocked at the RCC level, the call reverts back to the network. The RSCIS blocking line-to-line peg, RSCISBLL, is increased.

Logs

RSC-DLM ESA and Intraswitching does not affect logs.

User interface

RSC-DLM ESA and Intraswitching does not change the user interface.

Billing

RSC-DLM ESA and Intraswitching does not affect billing.

AD1288
Aries table control and CPI

Functionality name

Aries Table Control and CPI

Description

This feature introduces the Aries line of Integrated Voice and Data (IVD) sets and options to the Meridian SL-100 product line. Five Aries sets and several options are introduced to the Meridian SL-100 Central Control (CC) in the following areas:

- Table Control
- Call Processing
- Call Progress Indication
- Facilities Maintenance

Aries sets

The Aries line of IVD sets comprises five telephone sets. These sets are described in the following paragraphs.

- M2008: The Aries M2008 8-key set supports the following options:
 - M0200 display option
 - Asynchronous data option
 - External alerter
 - Power supply option
- M2616: The Aries M2616 16-key set supports the following options:
 - M0200 display option
 - One or two M0022 22-key add-ons giving the set a total of 38 or 60 keys
 - Asynchronous data option
 - External alerter
 - Handsfree
 - Power supply option

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Aries table control and CPI (continued)

- M2016S: The Aries M2016S 16-key secure set supports the following options:
 - M0200 display option
 - One or two M0022 22-key add-ons giving the set a total of 38 or 60 keys
 - Asynchronous data option
 - Factory installed power supply option
- M2216A: The Aries M2216A 16-key set supports the following options:
 - Factory installed M0200 display option
 - One or two M0022 22-key add-ons giving the set a total of 38 or 60 keys
 - Asynchronous data option
 - External alerter
 - Two RJ-11 jacks
 - Power supply option

Both RJ-11 jacks in the M2216A set support electret headsets. One RJ-11 jack is listen-only; the other jack is used for both transmitting and receiving. This set is fully operational with loop power.

- M2216B: The Aries M2216B 16-key set supports the following options:
 - Factory installed M0200 display option
 - One or two M0022 22-key add-ons giving the set a total of 38 or 60 keys
 - Asynchronous data option
 - External alerter
 - One PJ-327 jack
 - One RJ-11 jack
 - Factory installed power supply option

With the factory installed external power supply option, both the PJ-327 jack and the RJ-11 jack are functional. The PJ-327 jack supports a carbon headset for transmitting and receiving, and the RJ-11 jack supports a listen-only electret headset. Without the power supply option, the M2216B is completely powered by the subscriber loop, the PJ-327 jack is not functional, and the electret headset in the RJ-11 jack is used for both transmitting and receiving.

AD1288**Aries table control and CPI (continued)****Aries options**

Aries IVD telephone sets support a display option, a 22 key/lamp add-on option, an asynchronous data option, an external alerter option, and an external power supply option. These options are described in the following paragraphs.

- Meridian Programmable Data Adapter (MPDA): The entire line of Aries telephone sets support the MPDA, asynchronous data option. The MPDA is a single printed circuit pack (PCP) that is mounted in the Meridian Aries digital telephone set. The Aries asynchronous MPDA includes the following features:
 - Keyboard Dialing (KBD): The ability to originate data calls to local and remote hosts or data terminal equipment (DTE) by using the terminal keyboard. Keyboard dialing is only supported for ASCII, asynchronous, character mode, and interactive terminals.
 - AT Dialing: The capability of originating data calls using intelligent modem command set AT similar to Industry Standard Hayes Smart modem command set.
 - Extended AT Command Dialing: The capability to originate data calls from a data terminal or workstation to local and remote hosts/DTE from the MPDA.
 - Echo: During call set-up, all user inputs are echoed by the MPDA to the terminal. The user issues the command ``EO" to tell the MPDA not to echo.
 - MPDA Response Display: All messages displayed, to the terminal, are in upper case. The response from the MPDA is in word or digit code. The default response is word.
 - Call Disconnection: The user enters a command which causes the far end to disconnect the data call.
 - Escape Sequence: When configured for AT compatible keyboard dialing, the MPDA operation consists of two states: the command state and the on-line or transparent data state. In the keyboard dialing command state, user inputs are interpreted as call setup information. Once the call is established, the MPDA enters the on-line state and transmits all data on the RS232-C interface transparently across the network to the far end duplex device. It is the responsibility of the DTE connected to the far end MPDA to respond to user input. To return from the on-line state to the command state, the user uses the escape code sequence.
 - Parameter Registers (S registers): The parameter registers (S0 to S12) are used to program various call setup parameters. Querying the value

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Aries table control and CPI (continued)

- of a particular S-register is done by the command $Sr?$, where $r = 1$ to 12.
- Script File Learn Mode for Dumb Terminals: The capability of automatically dialing the local or remote host and transmitting the log-in sequence each time this feature is activated.
 - Self Diagnostics: When the MPDA is powered up, it executes the self diagnostic routine. The LED on the MPDA indicates the results of the diagnostics:
 - LED off: No power or bad LED
 - LED on: Failed self test
 - LED flashing (2 hz): OK
 - LED distinctive flash: Loss of communication with set, but MPDA is good
 - Download Request: Upon powering up, the MPDA sends a message requesting profile information on itself. Upon receiving this request, the DSIP downloads this information to the MPDA. Profile information is also being downloaded to the MPDA from the Central Control (CC) whenever the MPDA is Returned to Service (RTS) or when the Digital Line Module (DLM) is RTS.
 - M0200 Display Option: The entire line of Aries telephone sets support the M0200 display option. The M0200 display option is a modular accessory that uses a two-line by 24-character dot-matrix liquid crystal display. Information originating from the switch, MPDA, set, or the display option can be displayed on the screen. Sets equipped with a display option have added local features over the basic set. These features are:
 - Display of call timers
 - Predial: Predial allows the user to enter digits before going off-hook. (This is only possible once a display option has been physically attached to the set.)
 - M0022 Key/Lamp Option: A modular accessory that connects to the Aries terminals and provides 22 additional programmable feature keys. The terminals and modules attach such that they look like one integrated unit. This option is only available with the 16-key Aries sets M2616, M2016S, M2216A, and M2216B. A maximum of two modules can be added giving possibilities of 16, 38, and 60 programmable feature keys at these Aries stations.
 - Power supply option: The power supply option allows the Aries sets and other installed Aries options to use external (local) power rather than

AD1288**Aries table control and CPI** (continued)

subscriber loop power. The external power supply is used with Aries sets having the external alerter, the MPDA, the M0022 key/lamp option, boosted alerting volume, or carbon headsets installed.

Hardware requirements

The Meridian Aries IVD sets are only supported on the 7X49 Digital Line Module with 8X47BA Enhanced Digital Port Cards (EDPCs). The EDPC is a 16-port line card, with 16 voice and 16 data channels. (There are two channels per port.) The even-numbered channels (0 through 30) are the voice channels and the odd-numbered channels (1 through 31) are the data channels.

Limitations and restrictions

The features available to the Aries set/MPDA user is consistent with those available on other IVD sets/MADOs with the exception of the following:

- In Aries M2616 sets with handsfree, key 16 is dedicated to the handsfree option, disabling any features or directory numbers assigned to key 16.
- In sets that have the MPDA or M0200 display option, the top right feature key is dedicated as the local program mode key. This key controls access to the display or MPDA for parameter selection.
- Due to power consumption, the power supply option is factory installed in the Aries M2016S. This set does not operate on loop power.
- The user is restricted to entering only 0 to 9 in the drawer (or line subgroup) position of the line equipment number (LEN), when assigning (LENs) to the Digital Line Module (DLM).
- The Meridian IVD set must be added to an even numbered LEN.
- The MADO and MPDA must be added to an odd numbered LEN.
- If one of the 32 lines (16 voice lines and 16 data lines) in a Meridian IVD port card becomes disabled, it cannot be physically detached from a port card in the same way a line card can be removed from a drawer. A new LEN must be assigned to provide the subscriber continued service. To avoid assigning the bad LEN to another subscriber, the LEN must be entered in table IVDTRBL. Once entered in this table, the bad LEN cannot be reassigned.

Interactions

Aries XPM Software-Phase I is required for the Aries sets to function.

Aries Table Control and CPI has no functionality interactions.

AD1288

Aries table control and CPI (end)

Datafill

Table IVDINV is modified to accept the Aries line of sets.

Service orders

Aries Table Control and CPI does not affect SERVORD.

Operational measurements

Aries Table Control and CPI does not affect operational measurements.

Logs

Aries Table Control and CPI does not affect logs.

User interface

Aries Table Control and CPI does not change the user interface.

Billing

Aries Table Control and CPI does not affect billing.

AD1289
Aries XPM software

Functionality name

Aries XPM Software

Description

Changes are made to the terminal processing task (TPT) to incorporate the Meridian Module Telephone (MMT) series of Integrated Voice and Data (IVD) digital sets on the MSL-100. Changes are made to decode/encode the new messages necessary to support the MMT terminals and options. Other areas that involve modifications include:

- Call Progress Indication (CPI)
- MMT Call States
- Terminal diagnostics program or Station Ringer Test (SRT)

Call Progress Indication (CPI)

CPI is any information that describes what is happening to a call as it proceeds through the network to its destination. Information regarding alerting of the called party, answer by the called party, and routing to treatments, and tones and announcements are examples of CPI. The display and MPDA options of the MMT terminal must be updated.

MMT Call States

The MMT terminals support the following call processing states, which are also implemented on M3000 and M2317 sets. These states require minimal development to implement for MMT terminals.

- IDLE: On-Hook (voice and data)
- DIALTONE: Ready to transmit dialed digits
- ESTABLISHED: Connection made

MMT Terminal Diagnostics Program

The MMT Terminal Diagnostics program, also referred to as the Station Ringer Test, tests the hardware of the MMT terminal. The operation of the set is verified by providing a unique visual and/or audio response to each key hit.

Hardware requirements

The MMT series of IVD digital sets will only be supported on the DLM with 8X47BA Digital Port Cards (DPCs) and 8x49AB Digital Set Interface Processor (DSIP) and, on the IPE.

AD1289

Aries XPM software (continued)

Limitations and restrictions

The following restriction and limitations apply:

- The features available to the MMT user are largely consistent with those now available on the Meridian 2000 series sets; the features available to the MPDA user are largely consistent with those available for the MADO.
- The MMT terminals are IVD sets; one voice and one data circuit are multiplexed together on a single standard twisted pair via time compression multiplexing (TCM). The voice and data circuits for a given MMT must be assigned to consecutive line equipment numbers (LEN), the even circuit number being assigned to the voice line and the odd circuit to the data line.
- Since the 8X47 DPC is a multiple-port (32 port) card, the same maintenance restrictions that apply to M2000/M3000 series sets also apply to MMT terminals.
- A primary directory number (PDN) must be assigned to key one of the set before any features or DNs can be assigned to the set.
- Support of MMT terminals requires the AB version of the 8X49 (DISP) card in the DLM.
- The firmware version of the 8X49AB DSIP card must be 6.7 or greater in order for the MMT SRT to function properly.

Interactions

Aries XPM Software has no functionality interactions.

Datafill

Aries XPM Software does not affect data schema tables or office parameters.

Service Orders

Aries XPM Software does not affect SERVORD.

Operational measurements

Aries XPM Software does not affect operational measurements.

Logs

Aries XPM Software does not affect logs.

User interface

Aries XPM Software does not change the user interface.

AD1289

Aries XPM software (end)

Billing

Aries XPM Software does not affect billing.

AD1670

Aries Digital Set Interface Processor Firmware

Functionality name

Aries Digital Set Interface Processor Firmware

Description

This feature enables the MSL-100 to support Aries telephone areas and data cards. This feature provides additional signals/messages required to support the Aries set. The signaling consists of messages for call and data processing when the Aries set is equipped with the Aries Data Adapter (ADATA).

Maintenance

Tip and Ring polarity reversal is provided as a new maintenance function for Aries set detection. Aries set detection is provided by reversing the polarity of the 30V applied to the loop tip and ring. With normal polarity, the Aries set draws no current and is not detected by the facility measurement circuits. With polarity reversed, the set draws current and is detected by the sensors.

Hardware requirements

Aries Digital Set Interface Processor Firmware has no hardware requirements.

Limitations and restrictions

Aries Digital Set Interface Processor Firmware has no limitations or restrictions.

Interactions

This feature needs the following features to function properly:

- BF0828
- FD8X55
- AD1288
- AD1289
- AD1782
- AD1785

Datafill

Aries Digital Set Interface Processor Firmware does not affect data schema tables or office parameters.

Service Orders

Aries Digital Set Interface Processor Firmware does not affect SERVORD.

AD1670

Aries Digital Set Interface Processor Firmware (end)

Operational measurements

Aries Digital Set Interface Processor Firmware does not affect operational measurements.

Logs

Aries Digital Set Interface Processor Firmware does not affect logs.

User interface

Aries Digital Set Interface Processor Firmware does not change the user interface.

Billing

Aries Digital Set Interface Processor Firmware does not affect billing.

AD1671

Aries Data Firmware

Functionality name

Aries Data Firmware

Description

This firmware allows the Aries Data Card to interface with the Aries telephone sets and provide support for the following features:

- Key Pad Dialing (KPD)
- Key Board Dialing (KBD)
- AT Dialing
- Script

Key Pad Dialing

KPD provides the user the capability to originate data calls to local and remote hosts. The KPD feature is applicable for both synchronous and asynchronous modes.

The following key features are supported with the ADATA asynchronous data option:

Key Features

Features	Key Pad Dialing	Key Board Dialing
Auto Dial	X	X
Speed Call		X
Ring Again	X	X
Display of Call Number	X	X
Call Forward (SL1 only)		X
Modem Pooling		X

Key Board Dialing

KBD refers to the capability of originating data calls to local and remote hosts by using the terminal keyboard. The KBD feature is only supported for ASCII, asynchronous, character mode, and interactive terminals equipped with EIARS-232C interface.

AD1671**Aries Data Firmware** (continued)

The KBD feature provides the following capabilities:

- call origination and termination to/from local and remote data devices
- ring again capability
- auto dial calling
- speed calling
- automatic and manual answering of incoming calls
- automatic set relocation
- programming of speed call
- call origination and termination to/from local and remote data device
- ring again capability
- auto dial calling
- speed calling
- automatic and manual answering of incoming calls
- automatic set relocation
- programming of speed call
- auto dial numbers

AT Dialing

AT dialing refers to the capability of originating data calls to local and remote hosts or DTE using a terminal keyboard or personal computer. The AT dialing feature is supported only for ASCII, asynchronous, character mode, and interactive terminals equipped with EIARS-232-C interface. AT dialing supports many of the features of AT Smartmodem.

The AT dialing provides the following capabilities:

- call origination to local and remote hosts
- modem pool calls
- automatic and manual answering of incoming calls
- speed calls

Script File

The script file feature allows users to store host/terminal dialogs in the Aries Data Adapter. Script files can be recalled and used to automatically perform

AD1671

Aries Data Firmware (continued)

log on procedures. Script files are associated with either the auto dial feature or the speed call feature.

Hardware requirements

Aries Data Firmware has no hardware requirements.

Limitations and restrictions

The following are the limitations on the ADATA, since there are no dedicated Data DN key:

- Modem Pooling is not supported.
- Ring Again is placed automatically.
- Speed Call is not supported.
- Manual Answer is not supported.

The following are database considerations for the proper operation of keyboard dialing:

- Data DN and secondary DN have single appearances.
- Access to remote hosts allows external calls.
- The Data TN is configured with the digit display feature.
- The virtual keys of the Data Option are assigned.
- The Data Option have the following class of service:
 - Warning Tone Denied (WTD)
 - Call Pickup Denied (PUD)
 - Call Forward No Answer Denied (FND)
 - Call Forward Busy Denied (FBD)
 - Data (DTA)
 - Automatic Digit Display (ADD)

Interactions

Aries Data Firmware has no functionality interactions.

Datafill

Aries Data Firmware does not affect data schema tables or office parameters.

AD1671

Aries Data Firmware (end)

Service Orders

Aries Data Firmware does not affect SERVORD.

Operational measurements

Aries Data Firmware does not affect operational measurements.

Logs

Aries Data Firmware does not affect logs.

User interface

Aries Data Firmware does not change the user interface.

Billing

Aries Data Firmware does not affect billing.

AD1782**Aries service orders**

Functionality name

Aries Service Orders

Description

This feature adds the Aries line of Meridian Integrated Voice and Data (IVD) sets to MSL-100 Service Orders. The Aries sets included are:

(Sheet 1 of 2)

Aries Sets:	Description:
M2008	Aries 2008 8 key set. This set has the M0200 display option attached to it.
M2016	Aries 2016 16-key set. This set has the following options: • M0200 display option • One or two M0022 22-key add-ons allowing a total of 38 or 60 keys • Handsfree. Handsfree takes the position of key 16
M2016S	Aries 2016 set. This set is a secure IVD digital telephone set with 16 programmable feature keys. This set has the following options: • M0200 display option • One or two M0022 22-key add-ons allowing a total of 38 or 60 keys
M2216A and B	IVD digital ACD telephone sets with 16 programmable feature keys and an M0200 display option factory installed. Two versions of the M2216 ACD set exist: • M2216A has two RJ-11 jacks and supports only electronic sets • M2216B has one PJ-237 jack and one RJ-11 jack One jack is listen only and the other jack allows both transmit and receive.
MPDA	Meridian Programmable Data Adapter. An integrated data module that is a single Printed Circuit Pack (PCP) that is mounted in the Meridian Aries Digital telephone sets.

AD1782**Aries service orders** (continued)

(Sheet 2 of 2)

Aries Sets:	Description:
Key set	A telephone set that, in addition to the standard keyboard, has keys that are used for feature or Directory Number (DN) assignments.
M0022	22 key add-on option. This may be added to M2616, M2016S, M2216A, and M2216B sets. Each of these add-ons allows the user 22 additional keys for feature or DN assignment. Up to two of these can be added to each set.
M0200	This is the display option for Aries M2008, M2616, and M2016S sets. The M2216A and M2216B sets come with the display option installed.

This feature provides the user with a method of maintaining these sets with the database. Commands are provided to:

- add/delete options for a subscriber
- suspend or restore service
- query information on a subscriber

In addition to Service Orders, information on the subscriber line is obtainable using the Database Line Queries available to the user. These line queries include:

- QHU
- QHA
- QHASU
- QLOAD
- QLENWRK
- QLEN
- QDNSU
- QDNWRK
- QDN

Hardware requirements

The Meridian IVD sets are only supported on the NT7X49 Digital Line Module with NT8X47BA Enhanced Digital Cards (EDPCs). The EDPC is a

AD1782

Aries service orders (continued)

16-port line card, with 16 voice and 16 data channels. (There are two channels per port.) The even-numbered channels (0, 2, ..., 30) are the voice channels and the odd-numbered channels (1, 3, ..., 31) are the data channels.

Limitations and restrictions

When assigning Line Equipment Numbers (LENs) to the DLM, the user is restricted to entering only 0 to 9 in the drawer (or line subgroup) position of the LEN.

When assigning an IVD voice set to a LEN, the set may only be added to an even numbered LEN. When assigning the data device (MADO or MPDA) to a LEN, the device may only be an odd numbered LEN.

Meridian NT8X47 port cards contain 32 lines for use; 16 voice lines and 16 data lines. These lines may not be physically detached from a port card in the same way

When adding the M0200 display option to the Meridian Modular Telephone (MMT) Integrated Voice and Data (IVD) set, the display time and date portion of the feature is not active until the set is reset using a BSY followed by an RTS at the MAP, or unplugged at the jack and reconnected.

Interactions

Since IVD sets are already included in the service order environment, impact is minimal. This feature is an extension of existing p-phone/Meridian IVD Service Orders. The operation of Service Orders for p-phones, data-units, M5000 series, and Meridian IVD M2112, M2018, M2317, and M3000 sets are not affected.

Datafill

Aries Service Orders does not affect data schema tables or office parameters.

Service Orders

This is a service order feature. Refer to the description section for further description of the changes.

Operational measurements

Aries Service Orders does not affect operational measurements.

Logs

Aries Service Orders does not affect logs.

AD1782

Aries service orders (end)

User interface

Aries Service Orders does not change the user interface.

Billing

Aries Service Orders does not affect billing.

AD1785

Aries feature operation and displays

Functionality name

Aries Feature Operation and Displays

Description

This feature provides the necessary software to display information to a M0200 display on an Meridian Modular Telephone (MMT) IVD (Integrated Voice and Data) set. The M0200 is a feature available for the M2008, M2616 and M2016S sets and comes as standard equipment for the MS2216A and M2216B sets. This feature also provides modified facility maintenance diagnostics for testing the MMT sets, profile downloading for the MPDA (Meridian Programmable Data Adapter), MPDA system parameter download, and determines operation of the message waiting light on the MMT sets. The MMT set can also be attached to a personal computer (PC), allowing downloading of key and lamp status information to the PC.

User features

This feature allows users to do the following:

- display time and date
- display length of calls
- predial a number
- see the name or number of the party calling
- set volume levels for ringing, buzzing, on-hook dialing, handset, headset and hands free modes with the aid of display graphics
- view displayed general messages

Note: When adding the M0200 display option to the Meridian Modular Telephone (MMT) Integrated Voice and Data (IVD) set, the display time and date portion of the feature is not active until the set is reset using a BSY followed by an RTS at the MAP, or unplugged at the jack and reconnected.

On an MMT set equipped with a display, the display guides the user through the steps required to program the feature. Users can use the display to activate or deactivate the following options:

- Call Forwarding
- Auto Answer
- Make Set Busy
- Call Transfer

AD1785**Aries feature operation and displays** (continued)

- Conferencing
- Autodial
- Call Park
- Ring Again
- Speed Call
- Group Intercom
- Expensive Route Warning

Facility maintenance

The MMT line of IVD sets are part of the current facility maintenance offered for other IVD sets. The current IVD facility maintenance diagnostics are modified for testing the MMT sets in the same way other IVD sets are tested.

MPDA profile downloading

The profile information for downloading to the MPDA is taken from information entered in table DPROFILE. The information contains the data required for the operating parameters of the MPDA. Profile downloading for the MADO (Meridian Asynchronous Data Option) currently takes place whenever the DLM (Digital Line Module) peripheral or the MADO itself is returned to service, or when the MADO requests a profile. The profile for an MPDA is downloaded under the same circumstances that a profile for a MADO is downloaded.

When the MPDA is originally plugged into its jack, it sends an equipped message to the peripheral. If the peripheral has no profile information, it requests profile information to be downloaded from the CC (Central Control). The CC then sends profile information down to the MPDA, as is currently done for the MADO.

MPDA system parameter download

The MPDA can operate without profile information, but cannot operate without the system parameters. The system parameters required by the MPDA include the following information:

- SL1 or SL100 system indication
- idle timeout value
- directory number of the MPDA

These are sent to the MPDA upon receipt of a request for them from the MPDA. The idle timeout value is retrieved from the profile information

AD1785

Aries feature operation and displays (continued)

associated with the MPDA in the table DPROFILE. If there is no profile information available, then a default value of 0 (no timeout) is used. Time out values may be 0 to 3, with 1 indicating 15 minutes, 2 indicating 30 minutes and 3 indicating one hour of idleness before the data call is automatically released.

Operation of the MMT message waiting lam

The MMT IVD sets have a special lamp to indicate messages waiting. The lamp has no key associated with it, but comes on whenever a message is MMT message waiting lamp becomes lit when a message is waiting, message waiting was changed to allow assignment of it as a code access feature on MMT sets.

Downloading key and lamp status information

When an MMT set is attached to a PC, the PC can request information on the features and directory numbers assigned to the set. When the switch receives the request, it collects the information and sends it to the LTC (Line Trunk Controller). The LTC then sends it to the PC without intervention from the MMT set.

The PC may also need to know the status of the lamps on the set. When the PC requests the status of the lamps, the switch schedules a lamp audit for that particular set. When the audit runs, the lamp status goes to the PC without intervention from the set.

Note: This feature requires special software on the PC to interpret the information on the keys and the status of the lamps.

Hardware requirements

The Meridian MMT IVD sets are supported only on the 7X49 Digital Line Module with 8X47BA Enhanced Digital Port Cards (EDPCs). There are two channels per port. The even-numbered channels (0-30) are voice channels, and the odd-numbered channels (1-31) are data channels.

To determine if a particular Meridian voice set is equipped with an MPDA, add 1 to the circuit number of the LEN (Line Equipment Numbers) for the voice set to yield the LEN for the corresponding data channel and look in table IVDINV to see if there is an MPDA datafilled for this LEN.

AD1785**Aries feature operation and displays (continued)****Limitations and restrictions**

The following limitations and restrictions apply to Aries Feature Operation and Displays:

- When assigning LENs to a DLM, users can enter only 0 to 9 in the drawer or line subgroup position of the LEN. For example, if a user wants to assign an IVD set to LEN 2 0 1 10, the third position, which is the 1 in this case, is the drawer number of the LEN. When assigning an IVD voice set to a LEN number, the set can only be added to an even numbered LEN. For example, the set can be added to LEN 2 0 1 4, but not to LEN 2 0 1 5. Conversely, the MPDA may only be added to odd numbered LENs. These restrictions are necessary because of the way IVD sets and data devices are paired. The even LEN is for an IVD set's voice line, and the odd LEN is for that set's data device.
- Meridian 8X47 port cards contain 32 lines (16 voice and 16 data lines) that cannot be physically detached from a port card in the same way that a line card, such as a 6X21, can be removed from a drawer. If an IVD line becomes disabled, it cannot simply be pulled out and replaced, as can a 6X21 card. Because the one line is attached to the port card, removing the port card could interrupt the 31 other lines that are still good. To allow continuing service, another line can be assigned to the user. However, to do so frees the bad LEN, which another user can now choose. To avoid assigning a bad LEN to another user, this LEN can be entered in the IVDTRVL table. When a LEN is assigned to this table, it cannot be used to provide service. This table is checked before a LEN can be assigned to establish service.
- The set must have a Primary Directory Number (PDN) datafilled before data filling anything else for the set.
- If an MMT set has a display or has an MPDA datafilled, key 8 of the set becomes a local program key and can not be used for feature or DN assignment.
- The M0200 display can only be assigned to the M2008, M2616 and M2016S MMT sets, and comes standard with the M2216A and M2216B sets.
- The M0022 22-key addition can only be added to the M2616, M2016S, M2216A and M2216B sets.
- Entries for table IVDTRBL must be made through table control and not service orders.
- Hands free mode for the M2616 set is assigned to key 16, which prevents that key from being used for feature or DN assignment.

AD1785

Aries feature operation and displays (end)

Interactions

Aries Feature Operation and Displays has no functionality interactions.

Datafill

Aries Feature Operation and Displays does not affect data schema tables or office parameters.

Service Orders

Aries Feature Operation and Displays does not affect SERVORD.

Operational measurements

Aries Feature Operation and Displays does not affect operational measurements.

Logs

Aries Feature Operation and Displays does not affect logs.

User interface

Aries Feature Operation and Displays does not change the user interface.

Billing

Aries Feature Operation and Displays does not affect billing.

AD1802
MSN N00 dialing

Functionality name

MSN N00 Dialing

Description

This feature provides N00 dialing on a Meridian SuperNode (MSN) network. The Meridian SuperNode accepts an N00 number originated on-net that is routed to the Local Exchange Carrier (LEC) and back to the MSN, or an N00 number originated off-net and routed by the Equal Access End Office (EAEO) or Access Tandem (AT) to the MSN. The call is received over a Feature Group D (FGD) interface, routed through the MSN network, and terminated to an on-net or off-net destination.

N00 numbers include the following:

- 800 Incoming Wide Area Telephone Service (INWATS)
- 800 Universal Access (UA) service
- 700 and 900 services

800 INWATS Service

INWATS is a special service designed to meet the needs of customers who receive substantial volumes of long distance calls. This service allows a customer to receive telephone calls originating within specified service areas without a charge to the originating party. The terminating party, the customer, is charged for all calls.

Meridian SuperNode 800 INWATS service provides a customer with the capability to carry 800 INWATS calls routed to the customer's network by a given LEC. These calls are then routed through the MSN network to their on-net or off-net destinations.

800 Universal Access Service

Universal Access is a service that allows a customer to gain access to their network from various locations by dialing an 800 access code. The customer enters an authorization code and optionally an account code for screening and billing purposes. After gaining access to their network, the customer may dial any number valid in the caller's dial plan.

MSN 800 Universal Access service provides a customer with the ability to gain access to their network through a Feature Group D (FGD) interface by dialing an appropriate 800 number. After receiving the 800 number, the Meridian SuperNode returns a special dial tone (SDT) to the caller. From this

AD1802

MSN N00 dialing (continued)

dial tone, the caller dials the authorization code, destination digits, and optional account code. The destination digits must be dialed according to the caller's dial plan.

700 and 900 Services

700 and 900 numbers are either called party billed or calling party billed. Currently, one use of 700 calls is to give the caller an announcement stating that they have subscribed to the network of that 700 number.

MSN 700 and 900 services provide a customer with the capability to receive 700 and 900 numbers through a FGD interface, and charge the calls to either the originating or terminating party. The party that is billed depends on the datafill of the particular 700 or 900 number dialed.

If the call is called party billed, the 700/900 number may require validation of the caller's Automatic Number Identification (ANI). This requirement is specified by the datafill of each 700/900 called party billed number. An example of a called party billed call in which the caller's ANI must be validated is using a 700 number to verify that callers are subscribed to a given network. ANI validation is not the same as ANI screening.

If the number is calling party billed, then the caller is charged a flat rate for each call rather than being charged according to the call duration. In addition, ANI screening may be performed on the originator. Whether or not ANI screening is performed is based on a trunk group parameter. If ANI screening is performed for MSN 700 and 900 calls, it is performed in the same manner as for any other MSN pure FGD calls with one exception. Unlike other pure FGD calls that require ANI screening, MSN 700 and 900 calling party billed calls do not obtain a new customer group and NCOS from the ANI to translate the call.

Incoming Digit Format

The MSN receives two streams of digits from the EAEO or AT in the following format:

KP + (II + ANI) + ST

KP + N00 + NXX-XXXX + ST

Where N = 2 to 9, X = 0 to 9, Y = 0 to 9, and in parenthesis items are optional.

Whether or not ANI (II + ANI) is sent to the MSN depends on the datafill of the ANIDIGS field in Table TRKGRP.

AD1802**MSN N00 dialing** (continued)**800 Calls**

For 800 calls, the digit streams may also come from the EAEO or AT in the following format:

KP + (II + ANI) + ST

KP + 00Y + NXX-XXXX + ST

If the EAEO or AT that interfaces to the Meridian SuperNode serves only one NPA, then the second stream of digits comes into the MSN in the 800-NXX-XXXX format.

If the EAEO or AT that interfaces to the Meridian SuperNode serves more than one NPA, then the second stream of digits may come into the MSN in either format. If the originating NPA is the same as the NPA of the office that interfaces to the MSN, this stream is in the 800 format. Otherwise, it is in the 00Y format.

For the case where the 00Y format is used, the EAEO or AT strips the 800 digits and replaces them with 00Y. The Y digit is used to represent the NPA of the originator. The Bell Operating Company (BOC) notifies the MSN of the mapping of Y digits to NPAs. However, since the originating NPA is provided in the ANI, the 00Y digits are not needed by the MSN. The MSN strips the 00Y digits and replaces them with "800" so that proper translations and routing can be performed.

ANI Screening—800 Calls

ANI screening is not performed on 800 calls. However, the ANI is checked to insure that the NPA is received in the ANI.

The originating NPA is required in order to provide Banded Billing capabilities for INWATS. Banded Billing allows customers to charge INWATS subscribers different rates based on how far away the call originator is.

If NPA is not received in the ANI, the call is blocked and partial dial (PDIL) treatment given to the caller. This treatment is datafilled in table TMTCNTL.

ANI Screening—700/900 Calls

ANI screening is performed on some 700/900 calls. Whether or not a call is screened depends on the datafill of table TRKGRP, and on how the call is billed.

AD1802

MSN N00 dialing (continued)

If the ANISCREN field in table TRKGRP is datafilled "N", then ANI screening is not performed. If this field is datafilled "Y", then ANI screening may or may not be performed on a given 700/900 call. Whether or not a 700/900 call is screened depends on how it is billed.

ANI Validation Required

ANI screening is not performed on these types of calls. However, a 10-digit ANI must be sent to the MSN for ANI validation. A valid ANI is an ANI that is datafilled in table FGDANISC, the ANI screening table for FGD calls. If the caller's ANI is not found in this table, ANI validation fails, the call is blocked, and the caller is given vacant code treatment.

ANI Validation Not Required

No form of ANI screening is performed on these types of calls. No ANI is required in this case.

Calling Party Billed

ANI screening is performed on calling party billed 700/900 calls. If the ANI is not sent to the MSN, then the call is blocked and partial dial treatment is given to the caller.

With 700/900 calls, unless field ANISCREN in table TRKGRP is datafilled "Y", ANI screening is not performed.

N00 Pretranslator Screening

The first three digits of the second digit stream is screened. If these digits are "N00", the new N00 Pretranslator table, table N00PXLA, is accessed to determine if the N00 number is an 800 INWATS, 800 Universal Access, 700, or 900 number. If the N00 number is not datafilled in this table, the call is blocked and vacant code treatment (VACT) is given to the caller. This treatment is datafilled in table TMTCNTL.

Note that the 00Y digits of 800 numbers are stripped and replaced with "800" at the time the first three digits are screened for being "N00".

800 Universal Access

If table N00PXLA designates the 800 number as a UA number, then the ANI is checked to insure that the NPA is present. If the NPA is present, translations proceed as specified for Universal Access Screening. Otherwise, the call is routed to PDIL treatment.

AD1802**MSN N00 dialing** (continued)**800 INWATS**

If table N00 PXLA designates the 800 number as an INWATS number, then additional information is obtained from this table before translations proceed. This additional information consists of a new NCOS as well as a new number. This "new number" is the actual number to which the 800 INWATS call must terminate. In addition, the ANI is checked for the originating NPA at this time.

After this information is obtained and if the NPA is found in the ANI, the new number obtained from the table is translated based on the customer group of the incoming trunk group and the new NCOS obtained from the table using regular IBN translations.

If the NPA is not found in the ANI, the call is routed to PDIL treatment.

700 and 900 Calls

If table N00PXLA designates the N00 number as a 700 or 900 number, then additional information is obtained from this table before translations proceed. First, whether the call is called or calling party billed is established. These two scenarios are discussed in the following:

- **Called Party Billed**—a new NCOS as well as a new number is obtained. This new number is the actual number to which the 700/900 call must terminate. In addition, whether or not the caller's ANI must be validated is determined by the datafill. If ANI validation is required, then table FGDANISC is checked for the caller's ANI. If the ANI is not found, the call is blocked and the caller given VACT. If the ANI validation is not required or if ANI validation passes, the new number is translated based on the customer group of the incoming trunk group and the new NCOS obtained from table N00PXLA using regular IBN translations.
- **Calling Party Billed**—a new NCOS as well as a new number is obtained. This new number is the actual number to which the 700/900 call must terminate. In addition, ANI screening is performed on the originating party. If ANI screening fails, the call is blocked and the caller given VACT. If ANI screening passes, then the new number is translated based on the customer group of the incoming trunk group and the new NCOS obtained from table N00PXLA using regular IBN translations. Note that unlike other pure FGD calls which require ANI screening, MSN 700/900 calling-party-billed calls do not obtain a new customer group and NCOS from the ANI to translate the call.

Universal Access Screening

After being screened by table N00PXLA, 800 UA calls are translated using regular IBM translations in order to be routed to table DNROUTE. IBN

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MSN N00 dialing (continued)

translations use the customer group and NCOS of the trunk group over which 800 calls come into the MSN in order to translate and route the calls to table DNROUTE.

The 800 UA number must be datafilled in table DNROUTE as a Meridian Off-net Access (MONA) Directory Number (DN). Translations should be set up so that 800 calls not terminating to MONA will not terminate to valid routes. In this way, if an 800 number is not datafilled as a MONA DN, the call is blocked and the caller receives VACT.

For 800 calls routed to table DNROUTE, the MONA feature is used to return Meridian SuperNode dial tone to the caller and to collect an authcode (authorization code), destination digits, and optionally, an account code.

The UA call has the following format:

800 UA access number + <SDT> + authcode + (account code)+ <RDT>
+ destination digits + (<SDT> + account code)

where <SDT> is special dial tone, <RDT> is regular dial tone, and parenthetical items are optional.

Note that an account code may be collected in one of two ways: with the authcode, or after the destination digits, but in either case it is optional. Also note that an account code is not verified for content, but for length.

After authcode, destination digits, and optionally, account code have been collected, regular IBN translations are used to translate and route the call to the proper destination based on the customer group of the MONA DN and the NCOS of the authcode.

Hardware requirements

MSN N00 Dialing has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to MSN N00 Dialing:

- An N00 number received over an FGD interface must be datafilled in table N00PXLA or the call is blocked and the caller receives vacant code treatment (VACT).
- An 800 number can be datafilled in table N00PXLA as an INWATS number, or a Universal Access number, but not both.

AD1802**MSN N00 dialing** (continued)

- An 800 Universal Access number must be datafilled in table DNROUTE as a Meridian Off-net Access (MONA) Directory Number (DN), or the call is blocked and the caller receives VACT.
- No ANI screening is performed for 800 calls.
- The NPA must be provided in the ANI for 800 calls or the call is blocked and the caller receives partial dial (PDIL) treatment.
- 700/900 calling-party-billed calls which require ANI screening must pass ANI screening, or the call is blocked and the caller receives VACT.
- 700/900 called-party-billed calls which require ANI verification must pass ANI verification, or the call is blocked and the caller receives VACT.
- The ANI of an on-net caller of a 700/900 number that requires ANI screening or ANI verification, is not the ANI that is used for ANI screening/ANI verification. On-net originated 700/900 calls should be routed to the LEC interface so that they can be routed back to the MSN over an FGD interface. However, when an on-net call is routed to the LEC, the caller's ANI is not sent to the LEC because regular IBN trunks do not send ANI. Therefore, the caller's ANI cannot be sent back to the MSN for ANI screening/ANI verification when the call is routed back to the MSN over an FGD interface. Instead whatever number the LEC sends to the MSN as the ANI, is the number that is used for ANI screening/ANI verification.

Interactions

The following paragraphs describe the interactions between MSN N00 Dialing and other functionalities.

MONA

An 800 Universal Access number is datafilled as a MONA DN.

Incoming Call Screening

Incoming call screening can be done on a per MSN basis using the customer group and NCOS. This screening is based on the destination digits. For INWATS and 700/900 calls, the customer group is obtained from the incoming trunk group data and the NCOS, from table N00PXL. For UA calls, the customer group is obtained from the MONA tuple in table DNROUTE and the NCOS, from table AUTHCDE.

Translations can be set up for the customer group and NCOS to block a given set of calls. For example, the customer may wish to block 800 INWATS calls originating and terminating in the same Local Access Transport Area (LATA).

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MSN N00 dialing (continued)

Datafill

Table N00PXL

A new table, N00PXL, is created by this feature. This is the N00 Pretranslator table for the Meridian SuperNode (MSN). It contains all 800 INWATS, 800 Universal Access, 700, and 900 numbers for a particular MSN corporate network.

For each number datafilled, the table contains a call type. Depending on the call type, the entry can also contain a new number to which the N00 number must translate, a new network class of service to translate that number, the billed party, and information that specifies whether ANI validation is to be performed.

Description of Changed or New Fields

The following are a description of changed or new fields:

- **N00DIGS**—N00 digits. This field contains the N00 (INWATS, UA, 700, or 900) number.
- **CALLTYPE**—Call type. Specifies whether the number is an INWATS, Universal Access, 700, or 900 number.
- **BILLPTY**—Billed party. Specifies whether the call should be charged to the originator (datafilled as CALLING) or terminator (datafilled as CALLED). This is only valid for 700 and 900 numbers.
- **ANICHECK**—ANI check. Specifies whether ANI validation ("Y" or "N") is required for this number. This is only valid for 700 and 900 called party billed calls.
- **NCOS**—Network class of service. The NCOS that is used to translate the TRANSDIG number. Note that the customer group used with this NCOS, is the customer group of the incoming trunk group of the N00 call entering the MSN. This is only valid for INWATS and 700/900 calls. It is not valid for UA calls.
- **TRANSDIG**—Translated digits. The actual number to which the N00 INWATS call must terminate, ie. the destination digits. This field is not valid for UA numbers.

Service Orders

MSN N00 Dialing does not affect SERVORD.

Operational measurements

MSN N00 Dialing does not affect operational measurements.

AD1802**MSN N00 dialing** (continued)**Logs**

MSN N00 Dialing does not affect logs.

User interface

MSN N00 Dialing does not change the user interface.

Billing

The following sections define what information the Meridian SuperNode will record in the described fields within the billing record.

800 INWATS

CALLED_DR—the TRANSDIG number obtained from table N00PXL.A.

MSN_N00—INWATS.

MSN_ACCESS_DN—the 800 INWATS number.

MSN_INFO_DIGS—the ANI information digits.

MSN_ANI_NUMBER—the originator's ANI.

800 Universal Access

CALLED_DR—the destination digits dialed.

MSN_N00—UNIVERSAL.

MSN_ACCESS_DN—the 800 UA number.

MSN_INFO_DIGS—the ANI information digits.

MSN_ANI_NUMBER—the originator's ANI.

AUTH_CODE—the authorization code dialed.

ACCOUNT_CODE—the account code dialed.

700 Service

CALLED_DR—the TRANSDIG number obtained from table N00PXL.A.

MSN_N00—700.

MSN_ACCESS_DN—the 700 number.

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MSN N00 dialing (end)

MSN_INFO_DIGS—the ANSI information digits.

MSN_ANI_NUMBER—the originator's ANI.

900 Service

CALLED_DR—the TRANSDIG number obtained from table N00PXL.

MSN_N00—900.

MSN_ACCESS_DN—the 900 number.

MSN_INFO_DIGS—the ANSI information digits.

MSN_ANI_NUMBER—the originator's ANI.

AD1946**MSN travel card number database****Functionality name**

MSN Travel Card Number Database

Description

This feature implements a travel card database to validate travel card numbers entered by off-network callers accessing the network. These callers now have the ability to place calls through the corporate network with the billing charged, if required, against the travel card number. Each travel card holder is assigned a 14-digit travel card number.

The travel card number database, used to screen every travel card call, consists of a new table called MSNTCN. This table is capable of holding 400,000 tuples with each tuple consisting of four attributes, namely, travel card number, network class of service, account code for billing purposes, and status of whether a call can proceed.

Hardware requirements

Data store for the MSNTCN table is dynamically allocated in blocks of 80 words with the addition of new entries. If the table is fully allocated for all 400,000 entries, it will require 2,020,000 words (5 words per tuple multiplied by 400,000 + 20,000 words of overhead).

Limitations and restrictions

The MSNTCN table is designed to hold up to 400,000 TCNs. However, the design chosen to implement this feature is based on the assumption that TCNs entered into the database are randomly generated numbers. This limitation is imposed due to the huge storage requirement for the database of this table.

Interactions

MSN Travel Card Number Database has no functionality interactions.

Datafill**Database table attributes**

The travel card number database consists of table MSNTCN that holds up to 400,000 tuples. Each tuple contains the following four fields:

- CARDNUM—a 14-digit travel card number (TCN) assigned to a subscriber. The required datafill for this field is a 14-digit number, with the first digit in the range of 2-9 and the following 13 digits in the range of 0-9.
- NCOS—Network Class Of Service. NCOS is basically IBN (Integrated Business Network) capability. Each customer group may have up to 256

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MSN travel card number database (continued)

different NCOS. Each NCOS basically defines the dial plan or view of the network. The required datafill for this field is a 3-digit number in the range of 0-255.

- ACCT—the account code may be required for billing purposes based on either the attributes of the TCN entered by the caller or by the route taken by the call. The account code length is fixed per customer group. It is based on NCOS of CARDNUM and the required datafill for this field is Y or N.
- ALLOW—indicates whether a call will be allowed to proceed or not. The required datafill for this field is Y or N.

Database editor commands

The requirement of storing 400,000 tuples on the MSN switch makes the usual approach in the database access implementation impossible. Therefore, some of the table editor commands execute differently from others existing on the DMS databases. The following is a list of these commands and their outcome if executed:

- LIST ALL—When in the MSNTCN table, all TCN tuples present in the database are displayed in the order they are stored and not in numerical order.
- DELETE—When in the MSNTCN table and after the tuple is deleted, the Table Control is positioned on the next TCN tuple stored in the database and not on the next number (TCN) that follows.
- BOTTOM—When in the MSNTCN table, the Table Control is positioned on the last TCN tuple as it is stored in the physical table and not on the last possible Travel Card Code (9999999999999999), even if it is present in the table. The same applies to the TOP command where unless the first TCN (2000000000000000) is in the database, the TOP command positions on the first TCN stored in the physical table.

Service Orders

MSN Travel Card Number Database does not affect SERVORD.

Operational measurements

MSN Travel Card Number Database does not affect operational measurements.

Logs

MSN Travel Card Number Database does not affect logs.

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MSN travel card number database (end)

User interface

MSN Travel Card Number Database does not change the user interface.

Billing

MSN Travel Card Number Database does not affect billing.

AD1979

MADO support of Smartcom II VI

Functionality name

MADO Support Of Smartcom II VI

Description

This feature allows the Meridian Asynchronous Data Option (MADO) to support the Hayes Smartcom III Version 1.0 software package. MADO adapter users can use commands compatible with the Hayes V-series Smartmodem 9600 to originate and answer data calls. This allows the MADO adapter to be used with the following software packages that also support Hayes protocol:

- Smartcom II Version 2.0
- Smartcom III Version 1.0
- Crosstalk Version 3.6
- Direct Access from Citibank (proprietary)

Selecting a keyboard dialing type

The MADO adapter exists in one of the following states:

- autobaud
- one of two KBD (Keyboard Dialing) type versions
- data mode

When the unit is powered up, the autobaud state is active until the user enters a valid autobaud character. The characters used for autobaud or autoparity determine the keyboard dialing type that becomes active. If the user enters a period (2EH) and a carriage return (0DH), the standard MSL-100 MADO KBD becomes active. If the user enters AT, the Hayes KBD is activated.

While in Hayes KBD state, the MADO adapter returns to autobaud state after each command is entered and after a call is taken down. In MSL-100 MADO KB state, at the completion of any call origination attempt, the MADO adapter returns to autobaud state. While in MSL-100 KB state, the user can use an AT command to place the MADO adapter into the Hayes KBD state.

Note: The AT is now displayed in the MSL-100 KBD menu. Its primary function is to allow users to toggle from the MSL-100 KBD state to the Hayes KBD state without entering the autobaud state. This allows users of Hayes-compatible software packages to recover if they inadvertently enter the MSL-100 KBD state.

AD1979**MADO support of Smartcom II VI** (continued)

Incoming calls activate the most recently used keyboard dialing method. Prompts are transmitted at the previously detected data rate, when the proper incoming call prompt is displayed. If the data rate of the DTE (Data Terminal Equipment) was changed but no autobaud occurred between then and the arrival of the incoming call message, the prompts are transmitted at an incompatible data rate. If the MADO adapter has no previous data rate stored, the incoming call pro is transmitted at 19.2 Kbaud. Garbage may be displayed if the DTE is not set to that data rate. The MADO adapter will not have a previous data rate if it was not autobauded since power-up or since the line has had some type of maintenance run on it.

Hayes command syntax

All Hayes commands have the prefix AT and are followed by a carriage return character that executes the command. The repeat previous command (A/) is the only exception to the command line structure. It is sent without the AT prefix and must appear on a line by itself. The MADO adapter examines the AT prefix and automatically determines the baud rate and parity settings of the data terminal equipment. (For more information, see features AD0067 and BF0818.) Both letters of the AT prefix must be entered in either upper case or lower case ("at" or "AT"), or the MADO adapter will not recognize the prefix.

Each command line can contain a number of commands concatenated together, but each line is limited to a maximum of 40 characters, excluding the AT prefix. Some commands must be entered on a line by themselves, as they prevent other commands on the same line from being processed. Most AT commands have selectable numeric parameters. For example, E0 turns off character echo, while E1 turns it on. When the MADO adapter receives a command without a parameter, it assumes 0. For example, E and E0 both turn character echo off. Punctuation characters, such as the hyphen and comma, are allowed for readability but take up space in the 40-character command line buffer. A space (ASCII 20H) can also be used, but does not take up space in the buffer.

Hayes operating states

When using Hayes keyboard dialing, the MADO adapter operates in autobaud, Hayes KBD, or online state. In the following description, the autobaud and Hayes KBD states are combined and referred to as command state. After power-up, the MADO adapter enters the command state. Hayes commands can be issued only when the MADO adapter is in this state.

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MADO support of Smartcom II VI (continued)

The MADO adapter remains in or enters the command state when:

- the MADO adapter is powered up
- no carrier is detected while originating or answering a call
- a carrier signal from the remote modem is lost
- the &D1, &D2, or &D3 option is selected and the MADO adapter detects an on-to-off transition of DTR (Data Terminal Ready)
- a semicolon is entered at the end of the dial (D) command to return the MADO adapter to the command state
- the escape sequence (+++) is entered while the MADO adapter is on line

In the Hayes command state user inputs are interpreted as call setup information. Once the call is established, as indicated by the CONNECT prompt, the MADO adapter enters the on line state and transmits all data on the RS232-C interface transparently across the network to the far-end MADO. The MADO adapter attempts to go on line in the following situations:

- the dial (D) command is issued
- the online command (O0 or O1) is issued
- the answer command (A) is issued
- the ring count (value of register S1) equals the number or rings to answer on (the value of register S0)

In this state, the MADO adapter acts as a full duplex device and it is the responsibility of the DTE connected to the far-end MADO to respond to user input.

Returning from online state to the command state can be done by using an escape code sequence. The default escape sequence consists of a minimum of one second (the escape guard time) of no data followed by three plus signs (+++) with less than one second between plus signs, followed by a minimum of one second of no data. It is extremely unlikely that such a sequence would be executed accidentally when in the online state. Both the escape guard time

AD1979**MADO support of Smartcom II VI (continued)**

and the escape character are programmable using registers S12 and S2. The following table shows a typical example of using the escape sequence.

Escape code sequence

Step	User Input	Prompt	Comments
1			Wait at least one second after previous entry.
2	+++		Spaced less than one second apart.
3			Wait at least one second before next entry.
4		OK	MADO return to command state.

Once returned to the command state, the user can, for example, release the call using the H command or re-enter the online state using the O command.

Dialing

The basic command for dialing is D followed by the telephone number. The dial command must have an AT prefix and end with a carriage return (<CR>). For example, ATD9974500<CR> dials 997-4500. No commands other than dial modifiers can follow the D command on the command line. An ERROR prompt is displayed if an illegal dial modifier is used, or if an unsupported number is dialed. The ERROR prompt also appears if any characters follow the ATD command from within the off-line mode. (Users cannot make a call from within the off-line mode, but can execute ATD alone.)

Dial modifier

Dial modifiers are special parameters used to tell the MADO adapter how to dial the telephone number. The following table shows the dial modifiers.

Dial modifiers (Sheet 1 of 2)

Dial Modifier	Description
0-9	Digits for dialing
A B C D	Characters for dialing

AD1979**MADO support of Smartcom II VI** (continued)**Dial modifiers (Sheet 2 of 2)**

Dial Modifier	Description
#	If used in the MSL-100 dialing phase, this character instructs the PBX to begin dialing the digits entered up to this point. (For example, ATD9974500#.) If used after the MSL-100 dialing phase, this character is outputted as a tone, as in ATD9974500,,,,1234*.
*	This character cannot be used in the MSL-100 dialing phase. If used after the MSL-100 dialing phase, this character is outputted as a tone, as in ATD9974500,,,,1234*.
'	Delay process the next character by one second. This delay is fixed at one second and may not be altered by register S.
;	Return to command state after dialing.
! @ P R T W	These characters can be used in the dialing string, but will have no effect on the dialing sequence.

The following table shows an example of a typical call setup sequence.

Typical dialing sequence

Step	User Input	Prompt	Comments
	ATD n nnn<CR>		MADO sends digits when the <CR> is received
			The network connection is established
	CONNECT		The data connection is established

Incomplete call

Calls can fail to complete the T-link handshake successfully because of incompatible parameters or a noisy data path. Register S7 specifies the maximum time to wait for the handshake to complete. If data sync is not found

AD1979**MADO support of Smartcom II VI (continued)**

in this amount of time, the call is released. This type of call progresses as shown in the following table.

Typical dialing sequence for an incomplete call

Step	User Input	Prompt	Comments
1	ATD nnnn<CR>		MADO sends digits when the <CR> is received
2			The network connection is established
3			The data connection fails
4		NO CARRIER	The call is released

Auto answer

Incoming calls will be answered automatically if the S0 register is set to any value between one and 255. The value assigned to the S0 register indicates the number of rings before the MADO adapter answers the incoming call. For example, if the S0 register contains 3, the MADO adapter rings three times before answering. If the MADO adapter is configured for auto answer, the default value of the S0 register is 1. Note that there is no audible ringing provided by the MADO adapter. The RI lead of the RS232 connection (pin 22) is toggled high for two seconds and low for four seconds. These cycles are counted the same as physical ringing would be.

The following table shows a typical auto answer sequence:

Auto answer sequence

Step	User Input	Prompt	Comments
1		RING	MADO detects the incoming call
2			MADO counts rings up to the value of S0
3			MADO answers
4		CONNECT	The data connection is established

AD1979**MADO support of Smartcom II VI** (continued)

Manual answer

If the S0 register contains 0, the MADO adapter does not answer automatically and must be answered using the A command. If the MADO adapter is configured for manual answer, the default value of the S0 register is 0. The following table shows a typical manual answer sequence.

Auto answer sequence

Step	User Input	Prompt	Comments
1		RING	MADO detects the incoming call
2			MADO rings
3	ATA<CR>		MADO answers
4		CONNECT	The data connection is established.

Call disconnection

If a number is dialed but no connection established, the MADO adapter is still in the command state and the call can be released by either an S7 time or by sending any character from the DTE to the MADO adapter. If a data connection has been established, the user can release a call by returning to the command state using the release sequence described previously, then entering the H command. The user can also release a call by dropping DTR (Data Terminal Ready), providing the MADO adapter was programmed with the &D2 or &D3 commands

S-registers

The S-registers (S0 to S58) can be used to program various call setup parameters. Query the value of a particular S-register by entering the following command:

Sr?

where r is a number from 1 to 58

AD1979**MADO support of Smartcom II VI** (continued)

The S-registers used by the MADO's Hayes-compatible keyboard dialing are shown in the following table.

Keyboard dialing parameter registers (Sheet 1 of 2)

Register	Range	Default	Description
S0	0-255 rings	0	Rings to answer on
S1	0-255 rings	0	Ring count
S2	Any valid ASCII code	43	Escape sequence character
S3	Any valid ASCII code	13	Carriage return character
S4	Any valid ASCII code	10	Line feed character
S5	0-32, 127 ASCII codes	8	Backspace character
S7	1-255 seconds ASCII code	30	Wait time for carrier
S8	0-255 seconds	2	Pause time for “,” (NOT SUPPORTED)
S10	1-255 X(0.1) seconds	7	Loss of carrier time out (NOT USED)
S12	20-255 X(0.02) seconds	50	Escape sequence guard time
S21			Reserved
S22			Reserved
S36	0,1	0	0 - no adaptation1 - no adaptation
S37	0-3, 5-7, 9	0	Select maximum connect speed
S38 - S50	0-255	0	NOT USED
S51	0-255 x(.25) seconds	16	Delay until modem pool activation
S52	Any valid ASCII character	39	Most significant product code character

AD1979**MADO support of Smartcom II VI** (continued)

Keyboard dialing parameter registers (Sheet 2 of 2)

Register	Range	Default	Description
S53	Any valid ASCII character	3 0	Least significant product code character
S54	Any valid ASCII character	30	Least significant product code character
S55-S58	0-255	0	NOT USED

Some registers defined in the Hayes keyboard dialing implementation are not applicable to the MADO adapter and are ignored. To reset registers S0 through S50 to their default values, use the software reset commands Z, Z1, &F, &Y, and &Y1. Registers S51 through S58 are reset to their default value only during power up.

It is important to note that the software does not perform a range check on the value assigned to an S register. The range in the previous table indicates those values that give the expected results. Any other values may or may not function as desired and are not flagged as an error when the command is processed. Valid ASCII codes range from 0 to 127. Values larger than 127 may disable the function associated with that S register. Values larger than 255 are accepted without an error but are stored as modulo 256.

Register S0 - Ring to answer on

S0 sets the ring on which the MADO adapter automatically answers a call. Setting S0=0 disables auto-answer.

Register S1 - Ring count

The MADO adapter automatically tracks the number of rings, incrementing and writing the value in S1

Register S2 - Escape sequence character

S2 holds the ASCII value of the escape sequence character.

Register S3 - Carriage return character

S3 holds the ASCII value of the carriage return character.

Register S4 - Line feed character

S4 holds the ASCII value of the line feed character.

AD1979**MADO support of Smartcom II VI (continued)****Register S5 - Backspace character**

S5 holds the ASCII value of the backspace character

Register S7 - Wait time for carrier

Calls can fail to complete a T-link handshake successfully because of incompatible parameters or a noisy data path. Register S7 specifies the maximum time to wait for the handshake to complete. If data sync is not found in this amount of time, the call is released and a NO CARRIER prompt displays.

Register S12 - Escape sequence guard time

S12 holds the value of the delay required before and following the escape sequence. The guard time also dictates how quickly the escape sequence characters must be entered, since the interval between entry of each of the three characters must be of shorter duration than that specified for the guard time.

Register S36 - Baud rate adaptation

When an attempt to make a connection fails because of incompatible baud rates, the MADO adapter reads this register to determine whether to terminate the connection or to adapt to the far-end baud rate. If the baud rates are incompatible and the S36 is set to 0, the MADO adapter hangs up. If S36 is set to 1, the MADO adapter is the calling party and the N0 command has been executed, the MADO adapter attempts to adapt at a baud rate equal to or less than the rate specified in register 37. If the far-end baud rate exceeds the S37 rate, the call is dropped. If the N1 command has been executed, the MADO adapter adapts to the far end regardless of the rate specified in register S37.

Register S37 - Maximum DCE (Data Communications Equipment) connect speed

The MADO adapter attempts to connect at the highest supported speed that does not exceed the value specified by this register. This register will be reset to 0 after each call is released. Valid values for this register are shown in the following table.

Register S37 - maxim DCE connect speed valid values (Sheet 1 of 2)

Register setting (S37=)	Result
0	Attempt to connect at speed of last AT command (Default setting)
1 - 3	Attempt to connect at 300 bps
4	Reserved

AD1979**MADO support of Smartcom II VI** (continued)

Register S37 - maxim DCE connect speed valid values (Sheet 2 of 2)

Register setting (S37=)	Result
5	Attempt to connect at 1200 bps
6	Attempt to connect at 2400 bps
7	Attempt to connect at 4800 bps
8	Reserved
9	Attempt to connect at 9600 bps
10 - 255	Reserved

Register S51 - Delay until modem pool activation

S51 holds the value of delay before Outbound Modem Pool activation. Each decimal increment of S51 represents a .25 second delay. This register is not altered by the software reset commands.

Registers S52 through S54 - Product code response

These three registers contain the Product Identification Code and is output in response to the I0 command. Valid values are as follows:

- 960 - Smartmodem V-series 9600 modem (default)
- 124 - Smartmodem 1200
- 240 - Smartmodem 2400 or Smartmodem V-series 2400

Result codes

The MADO adapter provides responses to commands in the form of result codes. Unless they are disabled with the Q1 command, a result code is displayed after a command is entered. Result codes can be displayed in either numeric form or in verbose (English) form as specified by the V command. The MADO adapter result codes and definitions are listed in the following table.

Result code summary (Sheet 1 of 2)

Digit code	Word code	Meaning
0	OK	Command line processed without error
1	CONNECT	Connection at 0 to 300 baud

AD1979**MADO support of Smartcom II VI** (continued)**Result code summary (Sheet 2 of 2)**

Digit code	Word code	Meaning
2	RING	MADO ringing.
3	NO CARRIER	Data sync lost or never found
4	ERROR	Command line error
5	CONNECT 1200	Connection at 1200 baud
7	BUSY	Busy signal detected
1 0	CONNECT 2400	Connection at 2400 baud
1 1	CONNECT 4800	Connection at 4800 baud
1 2	CONNECT 9600	Connection at 9600 baud
1 4	CONNECT 19200	Connection at 19200 baud

Command Set

The complete list of Hayes commands that the MADO adapter supports is in the following table. Note that if commands are input without a numerical parameter, it is assumed to be 0. For example, if the user enters ATE, it is interpreted as ATE0 and will disable the echoing of keyboard dialing commands.

Hayes command set (Sheet 1 of 4)

Command	Description
A/	A/Re-execute previous command line. This command is not preceded with AT or followed by <CR>.
A	Go into answer mode and attempt to go to online state
D	Go into originate mode, dial number that follows, and attempt to go to online state
E 0	Disable character echo in command state
E1*	Enable character echo in command state
H 0	Go on hook (hang up)

AD1979**MADO support of Smartcom II VI** (continued)**Hayes command set (Sheet 2 of 4)**

Command	Description
I 0	Request product identification code. Outputs contents of S registers S52 through S54. Valid values are 960 Smartmodem V-series 9600 modem (default), 124-Smartmodem 1200, 240-Smartmodem 2400 or Smartmodem V-series 2400
I1	Returns 206
I4	Displays a037800c004420 B100000000 (the same value that the Smartmodem V-series 9600 returns)
N0*	MADO attempts connection at baud rate selected by S37
N1	MADO ignores S37, connection is attempted at the speed of last auto baud command.
O	Go to online state
O1	Same as ATO
Q 0*	MADO returns result codes
Q1	MADO does not return result codes
Sr	Set pointer to register r
Sr=n	Set register r to value n
S r?	Display value stored in register r
V 0	Display result codes in numeric form
V1*	Display result codes in verbose form (as words
X 0	Enable result codes 0-4
X1	Enable result codes 0-5, 10-12, 14
X2	Same as X1
X3*	Enable result codes 0-5, 7, 10-12, 14
X4*	Same as X3

AD1979**MADO support of Smartcom II VI** (continued)**Hayes command set (Sheet 3 of 4)**

Command	Description
&C0	Assume data carrier is always present. This command asserts the three EIA (Electronic Industry Association) control leads: CTS, CD (Carrier Detect), and DSR (Data Set Ready). This command is the default if ASSERTRTS DPOPT is not datafilled for the MADO adapter. CTS, CD, and DST tracks far-end RTS (Return To Service). This command is the default if ASSERTRTS DPOPT is datafilled for the MADO adapter.
&D0	Ignore DTR. This command is the default is ASSERTDTR DPOPT is datafilled for the MADO adapter.
&D1	Assume command state when on-to-off transition of DTR occurs
&D2	Hang up when on-to-off transition of DTR occurs. This command is the default if ASSERTDTR DPOPT is not datafilled for the MADO adapter.
&D3	Hang up and reset to default setting (MADO profile configuration).
&Q0	MADO ignores S37 and attempts connection at the speed of the last autobaud command. This command is identical to the N1 command and is generated by Smartcom III if the V-series error control option is set to N. The V-series error control option can be reached using the the Connect Settings menu in Smartcom III.
&Q5*	MADO attempts connection at the baud rate selected by S37. This command is identical to the N0 command and will be output by Smartcom III if the V-series error control option is set to Y or H. The V-series error control option can be reached using the Connect Settings menu in Smartcom III.
&R0	CTS, CD, and DSR tracks the far-end RTS. This command is the default if ASSERTRTS DPOPT is not datafilled for the MADO adapter.
&R1	Assume CTS is always present. This command asserts the three EIA control leads: CTS, CD, and DSR.

AD1979**MADO support of Smartcom II VI** (continued)

Hayes command set (Sheet 4 of 4)

Command	Description
&S0	Assume DSR is present. This command asserts the three EIA control leads: CTS, CD, and DSR. This command is the default if ASSERTRTS DPOPT is datafilled for the MADO adapter.
&S1	CTS, CD, and DST will track the far-end RTS. This command is the default if ASSERTRTS DPOPT is datafilled for the MADO adapter.
Z0	Reset MADO to default settings.
Z1	Same as ATZ0
&F	Same as ATZ0
&Y0	Same as ATZ0
&Y1	Same as ATZ0

The following commands are supported but not executed. They do not return an error code.

- B0
- B1
- C0
- C1
- F0
- F1
- H1
- I2
- L0
- L1
- L2
- L3
- M0
- M1

AD1979**MADO support of Smartcom II VI** (continued)

- M2
- M3
- W0
- W1
- Y0
- Y1
- *G0
- &G2
- &J0
- &J1
- &K1
- &K2
- &K3
- &K4
- &K5
- &L0
- &L1
- &M0
- &P0
- &P1
- &T0
- &W0
- &W1

The following commands are not supported. They return an error message.

- H2
- I3
- O2
- Q2
- &M1

AD1979

MADO support of Smartcom II VI (continued)

- &M2
- &M3
- &Q1
- &Q2
- &Q3
- &Q4
- &T1
- &T2
- &T3
- &T4
- &T5
- &T6
- &T7
- &T8
- &X0
- &X1
- &X2
- &V
- &ZN=x

Hardware requirements

MADO Support Of Smartcom II VI has no hardware requirements.

Limitations and restrictions

MADO Support Of Smartcom II VI has no limitations or restrictions.

Interactions

MADO Support Of Smartcom II VI has no functionality interactions.

Datafill

MADO Support Of Smartcom II VI does not affect data schema tables or office parameters.

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MADO support of Smartcom II VI (end)

Service Orders

MADO Support Of Smartcom II VI does not affect SERVORD.

Operational measurements

MADO Support Of Smartcom II VI does not affect operational measurements.

Logs

MADO Support Of Smartcom II VI does not affect logs.

User interface

MADO Support Of Smartcom II VI does not change the user interface.

Billing

MADO Support Of Smartcom II VI does not affect billing.

AD2066

Monitor terminal activity

Functionality name

Monitor Terminal Activity

Description

This feature implements a new Command Interpreter (CI) command called MONITOR. It allows a privileged user, at an isolated Maintenance and Administration Position (MAP) session, to conduct surveillance on the MAP session of a selected general user or device.

The MONITOR command is used to monitor every command, response, and output of a particular user's MAP session. Any output from the specified Monitor Device or user is displayed on the User's Video Display Unit (VDU) terminal.

Hardware requirements

Monitor Terminal Activity has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Monitor Terminal Activity:

- When MONITOR is started, all keyboard input from the user is ignored. A Break/Stop sequence is used to stop Monitoring.
- The MONITOR is only started by a user with the (VDU).
- Terminals intended for use as Monitoring Terminals must have higher baud rates than the Terminals being monitored.
- Monitoring a Monitoring User is not allowed.

Interactions

The dedication of the Monitoring Terminal to the monitoring function limits interactions.

Datafill

Monitor Terminal Activity does not affect data schema tables or office parameters.

Service Orders

Monitor Terminal Activity does not affect SERVORD.

AD2066

Monitor terminal activity (end)

Operational measurements

Monitor Terminal Activity does not affect operational measurements.

Logs

Monitor Terminal Activity does not affect logs.

User interface

A new (CI) command, MONITOR, is created by this feature.

Billing

Monitor Terminal Activity does not affect billing.

AD2146

Personal identification numbers

Functionality name

Personal Identification Numbers

Description

Personal identification numbers (PIN) are multi-digit codes used as another level of screening beyond the Authorization code in order to identify a caller. An Authcode (Authorization code) can have either a single 1 to 4 digit PIN or multiple PINs associated with it. Multiple PINs can be associated with the same authorization code and each PIN can identify a different person, even though they are using the same authcode. Each PIN digit value is in the range 0 to 9 and the PIN digits are collected in DTMF format. In case of multiple PINs, this feature supports 2-digit PINs and 3-digit PINs for each authorization code.

If a single PIN is associated with the authcode, then it is stored in table AUTHCDE. If multiple PINs are associated with the authcode, then they are stored in table PINDATA and the index is stored in the PININDEX field of table AUTHCDE.

This feature provides the following capabilities:

- Provides the MSL-100 system with the capability to collect PIN digits based on the authcode parameter, and then validates dialed PIN digits against PIN digits stored in the authcode parameter if a single PIN is associated with the authcode, or against the PINDATA database if multiple PINs are associated with the authcode. This is applicable to the following calls: Feature Group A (FGA), Feature Group B (FGB), Feature Group D (equal access plan) cut-through (FGD), Feature Group D (interim dialing plan) cut-through (FGD), Universal Access 800 calls, and Direct Access Trunk (DAT) cut-through.
- Creates PINDATA database (for each switch) to support multiple PINs for each authcode.
- Provides region code (the region where the trunks are originated and assigned to each region in the MSL-100 network, depending upon the geographical location of the region) capability for FGA, FGB, FGD, and DAT.
- Provides billing capability for PIN digits to be recorded in station message detail record (SMDR).

Note: PIN digits will be collected and validated on MSL-100 trunks (MSL-100 agencies) only.

AD2146**Personal identification numbers** (continued)**PIN digits**

PIN digits can be required to be entered based upon an authcode parameter. If they are required, the expected number of digits will be collected immediately after the Authcode. PIN digits can range from one to four digits in length. If a single PIN is associated with an authcode, then it is stored in table AUTHCODE (authcode database). If multiple PINs are associated with the authcode, then they are stored in table PINDATA and the index into table PINDATA is stored in the PININDEX field in table AUTHCODE. Each PIN digit can have a value of 0 to 9 and the PIN digits are to be collected in DTMF format.

Authorization code dialing

All calls entering an MSL-100 system by FGA, FGB, FGD EAP cut-through, FGD interim dialing cut-through, DAT cut-through and UA access, invoke the Meridian OffNet Access (MONA) feature for collection of authorization code, PIN digits, account digits, and destination digits.

Optional PIN digits may be required to be input based on attributes of the authcode. If an authcode specifies that PIN digits are required to be input, then PIN digits should be dialed immediately after the authcode. If the dialed PIN digits are not valid against filed PIN digits associated with that particular authcode, then the call will get reorder treatment after collecting destination digits. So even if PIN digits are invalid, the MSL-100 system collects destination digits as if the dialed PIN digits were valid in order to not give any hints to the caller that the dialed PIN digits are invalid. This is done for authcode security reasons.

PIN digit concept

This feature introduces two different concepts for the MSL-100 system in connection with PIN digits based on the authcode parameter PINSTATS (PIN status). They are REQUIRED PIN and OPTIONAL PIN based upon Region code. Before we go to PIN concept details, we need to define what is the Region code of the authorization code and trunk group.

Region code

The entire MSL-100 network serving a physical area is divided into different regions. Each region is assigned a region code number (region codes range from 0 through 2047) depending on its geographical location in the network. All authorization codes assigned to subscribers of the MSL-100 network belonging to a particular region, will have the same region code. Similarly, all incoming trunks that are coming in from a particular region will have the same region code.

AD2146

Personal identification numbers (continued)

Required PIN

This “required” PIN concept, when datafilled against an authorization code, specifies that a PIN be entered following the dialing of the authorization code. In other words, the PIN digits must always be dialed by the caller, regardless of the region from where the caller is making the call. Either a SINGLE PIN or a MULTI PIN must be filed with the authorization code in this concept. The authorization code obtains this required PIN concept status by having its PIN status field datafilled with REQUIRED. In this case we do not bother about the region code of the authorization code or the region code of the incoming trunk group. The MSL-100 system always collects PIN digits and validates it against the database.

Optional PIN based upon region code

This PIN concept is based upon having a region code datafilled against the authorization code and against the various incoming trunks. It also requires the dialing of PIN digits following the authorization code only if the region code that is datafilled against the authorization code does not match the region code datafilled against the incoming trunk.

If the region code datafilled against the authorization code does match the region code datafilled against the incoming trunk, then the dialing of PIN digits following the authorization code is not necessary. The caller must not dial PIN digits even though the PIN digits were datafilled with his authorization code to make a call. If the caller dials PIN digits following the authorization code, in this case, the call will go through and get reorder treatment after collecting destination digits. Therefore, the caller must not dial PIN digits if the call is originated in his home region (authcode region code is same as the originating trunk's region code). Either a SINGLE PIN or a MULTI PIN must be filed with the authorization code in this concept. The caller, in this case, should be aware of the requirement of dialing PIN digits as well as to whether he must dial PIN digits following the authorization code for a successful call. If the call originates in the caller's HOME REGION, then PIN digits should not be dialed. If the call does not originate in the home region (region code of caller's authcode), then PIN digits must be dialed by the caller.

Hardware requirements

Personal Identification Numbers has no hardware requirements.

AD2146**Personal identification numbers** (continued)**Limitations and restrictions**

The following limitations and restrictions apply to Personal Identification Numbers:

- PIN digits are collected and validated only in calls that invoke the MONA feature for collection of Authcode and destination digits.
- The combined total number of Authcode, Security digits, PIN digits and Account Code (Auth_account combination) digits should not exceed 24.
- The valid range of PININDEX values is 0 to 8191. Values 0 through 4095 are reserved for 2-digit PINs while values 4096 through 8191 are reserved for 3-digit PINs. Consequently, 2-digit and 3-digit PINs can not be intermixed for the same PININDEX.
- Only 2-digit and 3-digit PINs are allowed when validating PINs using the table PINDATA.
- PINDIGS and PININDEX are mutually exclusive.
- In case of OPTBYREG authcode, when the authorization code's region code matches the region code of the incoming trunk and the MSL-100 receives PIN digits, the call gets reorder treatment after the collection of destination digits.
- If the PIN status (PINSTATS) field of an authcode is datafilled with an Optional by Region (OPTBYREG) field and the REGNCODE is not datafilled in the incoming trunk, then the call gets reorder treatment after collecting destination digits.
- PIN digits are not collected for Authorization hotline calls.
- PIN digits are not recorded in the SMDR record if the caller dialed an invalid authorization code.

Interactions

The following paragraphs describe the interactions between Personal Identification Numbers and other functionalities.

Meridian OffNet Access (MONA)

All calls entering an MSL-100 system using FGA, FGB, FGD cut-through, and 800 UA access will invoke the Meridian OffNet Access (MONA) feature for collection of authorization, PIN digits, account digits, and destination digits.

AD2146

Personal identification numbers (continued)

Reset dialing

When a dialing mistake is made while dialing PIN digits, the caller may enter "*" (an asterisk) to receive dial tone from the MSL-100 system and then redial the digit sequence prompted for by the previous dial tone. Hence, if a dialing mistake is made while entering the PIN digits, a caller does not have to dial the corporate network access number again but will have to enter the authcode.

Call reorigination

Anytime after a call involving PIN digits dialing has completed routing, the caller may enter a "#" to disconnect the current call, thereby receiving dial tone from the MSL-100 system and dialing another destination. Hence, the caller does not have to redial the corporate network access number, authorization digits and PIN digits again. In call reorigination, the PIN digits that are stored in the SMDR Extension Billing Record (format #DC) for the very first call, will be retrieved and used for subsequent calls.

Reorigination is allowed based on the field "REORIG = Yes" in table TRKGRP data. Also note that reorigination is only valid for trunk originated calls.

Datafill

Table PINDATA

This feature develops a database to support multiple 2-digit and 3-digit PINs for each authcode. This PIN database supports 4096 lists of 2-digit PINs (maximum of 100 for each list or index, or both) and 4096 lists of 3-digit PINs (maximum of 1000 for each list or index, or both).

A new table, PINDATA, is created for this feature. Table PINDATA contains a list of valid 2-digit or 3-digit PINs for a particular index. Only digits 0 through 9 are valid PIN digits. The valid range of values for 2-digit PINs is 00 through 99. The valid range of values for 3-digit PINs is 000 through 999. The index into table PINDATA should correspond with an allocated PININDEX (table AUTHCDE). The valid range of an index is from 0 through 8191. Two-digit PINs are only allowed from index 0 through 4095; 3-digit PIN indexes are valid from 4096 through 8191. The index and PIN comprise the two-part key to table PINDATA. The two-part key is the entirety of the PINDATA tuple. Because the PINDATA tuple consists only of a key, a change operation is not valid. To effect a change the tuple must first be deleted and then readded. The list of valid PINs for a given index is built by doing successive adds, specifying the same index but different PINs.

The field PININDEX, the index portion of a key, is a part of the authorization code. Each index can be associated with 100 PINs or 1000 PINs, depending

AD2146**Personal identification numbers** (continued)

upon the index value. (Indices 0 through 4095 are allocated for 2-digit PINs while indices 4096 through 8191 are allocated for 3-digit PINs.)

The field PINDIGS is the second part of a key disabled. The dialed PIN will be compared to this filed PIN. PIN digits are used to identify a caller beyond his authcode.

Table TRKGRP

A new option REGION is being added to the OFNTOPTS area for IBNT1 and IBNT2 trunks. This option allows for a region code field assignment to FGA, FGB, FGD, and DAT trunks. The range of the trunk group region code is 0 through 2047.

In OFNTOPTS (Off-Net Options), a new option, REGION, has been added to this subfield.

The field REGION, contains Region code and the geographical location of the trunk. This field appears only when option REGION is datafilled for the OFNTOPTS field.

Table AUTHCDE

Table AUTHCDE implements the Authorization Code feature that is used to identify callers for billing purposes, assign Network Class of Service (NCOS) and control network access.

Within the option area of this table is the option PIN (Personal Identification Number), which can be used as a further enhancement for billing purposes.

A new field OPTIONS has been added to table AUTHCDE by this feature. This field will allow options to be added to the authcodes in this table. To implement this feature a new option, PIN, is added to different auth options to prompt for PINSEL and PINSTATS fields to table AUTHCDE.

The PIN can be either of the following:

- A single PIN assigned (filed) against this particular authorization code.
- An index into table PINDATA that contains a list of either 2-digit or 3-digit PINs that are used in conjunction with the authorization code.

AUTHCDE PIN option

The following are the various subfields and descriptions associated with the PIN option, and explanations on how to achieve the various PIN concepts as outlined in the preceding information.

AD2146**Personal identification numbers** (continued)

PINSTATS (PINSTATUS)—this field determines what kind of PIN status should be given to the authorization code. It also determines whether or not the requirement of PIN digit dialing should be based on the region code of originating trunk group and the region code of authorization code.

The PINSTATS field can be datafilled as:

- **REQUIRED** (required PIN)—when REQUIRED is datafilled for the PINSTATS field of the authorization code. This means that the MSL-100 system always expects PIN digits to be collected for validation, following the authorization code from the caller. Since region code screening is not required for this REQUIRED PIN authcode, we do not require the region code field of the authorization code to be datafilled. Thus the table control would not prompt for region code for the authorization code to be datafilled.
- **OPTBYREG** (Optional by Region)—when OPTBYREG is datafilled for the PINSTATS field of the authorization code. This means that the MSL-100 system expects PIN digits to be collected for validation following the authorization code from the caller, only if the region code of the authorization code does not match the region code of the incoming trunk group over which the call is originated. Since region codes are required to be screened in this situation, we do require the region code field of the authorization code to be datafilled. Thus the table control would prompt for region code for the authorization code to be datafilled.
- **PINSEL** (PIN SElector)—this field is used to indicate whether a SINGLE PIN or a MULTIPLE PIN is to be filed (datafilled) against this particular authorization code.

The PINSEL field can be datafilled as either:

- **SINGLE** (Single PIN only)—this field would be prompted by the table control if the PINSEL is set to SINGLE. This field is being used to file a single PIN digit associated with the authorization code.
- **MULTIPLE** (Multiple PINs)—this field is prompted by the table control if the PINSEL is set to MULTIPLE. This field is being used to support multiple PINs. It also makes it possible to file multiple PINs instead of just a single PIN against an authorization code. This PININDEX will be used to access table PINDATA, where a list of PINs are stored at the PININDEX.

AD2146**Personal identification numbers** (continued)

In addition to PINSTATS and PINSEL, the following fields are also changed or new:

- **OPTIONS**—authcode different options (PIN is an example).
- **PININDEX**—each index can be associated with 100 PINs or 1000 PINs, depending upon its index value.
- **PINDIGS**—the actual PIN digits associated with the authcode will be stored in this field. The dialed PIN will be compared to this filed PIN. PIN digits are used to identify a person beyond the caller's authcode.
- **REGNCODE**—an authcode may be assigned a region code depending on its geographical location.

Single PIN validation

A single 1- to 4-digit PIN can be associated with an authcode. If PIN digits are required to be entered by the caller, the dialed PIN digits are compared against the PIN digits filed in the caller's authcode (PINDIGS). If the dialed PIN and filed PIN match, then the call will progress normally. Otherwise, the caller gets reorder treatment after the collection of account and destination digits. Each PIN digit is in the range of 0 through 9. The dialed PIN can be recorded in the station message detail record (SMDR).

Multiple PINs per authcode

Multiple PIN digits per authcode will support multiple 2-digit or 3-digit PINs for each authcode. This feature implements a new table, PINDATA, to contain the list of PINs. This table supports 4096 lists of 2-digit PINs (maximum of 100 for each list or index, or both) and 4096 lists of 3-digit PINs (maximum of 1000 for each list or index, or both). Only digits 0 through 9 are valid PIN digits. The index into table PINDATA should correspond with an allocated PININDEX (table AUTHCODE).

PIN digit screening is done as follows: PIN digits dialed are screened against the PINs datafiled in table PINDATA at index PININDEX (authcode field). If the dialed PIN and filed PIN match, then the call progresses normally; otherwise, the call gets reorder treatment after collecting account digits and destination digits. The PIN digits dialed can be recorded in the station message detail record (SMDR), even if PIN digits are not valid.

Table CUSTSMDR

This feature adds a new option, PIN, to table CUSTSMDR. This option is used to control the generation of the new SMDR extension record for PIN required calls, which is used to record PIN digits for billing.

AD2146

Personal identification numbers (continued)

The OPTIONS field has been changed to include a new field, PIN. This field is added to the list of options to allow for the generation of a new SMDR extension record for any call involving PIN digits dialing for billing purposes.

Datafill sequence

The order of datafill for tables AUTHCDE, TRKGRP, and PINDATA is given below:

- Table AUTHCDE
If PINSTATS = OPTBYREG, then table TRKGRP must be datafilled with the REGION option. Table TRKGRP is not required.
If PINSEL = MULTIPLE, then table PINDATA should be datafilled.
- Table TRKGRP
If PINSTATS = OPTBYREG only.
- Table PINDATA
If PINSEL = MULTIPLE only.

Service orders

Personal Identification Numbers does not use SERVORD.

Operational measurements

Personal Identification Numbers does not affect operational measurements.

Logs

The existing IBN logs are used to inform the switch administration of any failures encountered with call processing procedures accessing table AUTHCDE or table PINDATA.

User interface

Personal Identification Numbers does not change the user interface.

Billing

The PIN digits, whether valid or not, can be recorded in the station message detail record (SMDR) for all calls when PIN digits are required to be dialed as second level screening.

A new SMDR Extension Record Format (#DC) is generated for PIN digit calls when option PIN is datafilled in table CUSTSMDR.

AD2146

Personal identification numbers (end)

The SMDR Extension Record format #DC contains the following fields:

- Record Code—value #DC. This is a two-character code that identifies the PIN SMDR Extension Record.
- Pin Digits—this field is a 14-digit field that contains the personal identification number (PIN) that the subscriber dialed. This is 14 digits because it is also used to record the travel card number on travel card calls.
- PIN Validation—this is a one-digit field that contains information dealing with the PIN digits. The possible values of this field are Valid_PIN (1) or Invalid_PIN (2).

AD2175

Feature group D ANI delivery

Functionality name

Feature Group D ANI Delivery

Description

The purpose of this feature is to provide mapping of Automatic Number Identification (ANI) information resident on originating Integrated Business Network (IBN) Multi Frequency (MF) in-band signaling Feature Group D (FGD) trunks, to terminating agents possessing Calling Party Identification (CPI) capabilities including both IBN Integrated Services Digital Network (ISDN) User Part (ISUP) Signaling System #7 (SS7) and IBN ISDN Primary Rate Access (PRA) trunking facilities for applicable Meridian SuperNode (MSN) configurations.

This method of tandeming calls traversing the network through either the IBN ISUP SS7 or IBN ISDN PRA terminating trunk facilities provides the capability of supplying incoming Calling Line Identification (CLID) information to remote sets capable of displaying CLID information about the calling party that originated from an off-net location.

Different methods of billing FGD calls

There are different FGD dialing plans available through the FGD protocol.

FGD calling party billable calls

The following FGD dialing plans are referred to as calling party billable calls. This means that originating agents that use these FGD dialing plans bill the calling party for the call. FGD calling party billable calls are billed by one of the following methods:

- Billable by ANI—there may be ANI screening provided with this dialing plan. An example is FGD Pure (national and international dialing).
- Billable by Authorization Code (Authcode/Travel Card Number (TCN)—no ANI screening is possible with this dialing plan. Examples include: FGD Pure dialing 800 Universal Access Numbers, FGD Cut-thru (EAP dialing), and FGB Cut-thru (interim dialing). Note that 800 calls only examine the originating NPA of the ANI.
- Billable by both methods—there may be ANI screening provided with this dialing plan. Assuming that ANI screening is successful, the call may then appear as a calling party billable by Authcode/TCN. An example is FGD Pure dialing a Meridian Off-net Access (MONA) Listed Directory Number (LDN).

AD2175**Feature group D ANI delivery (continued)****FGD called party billable calls**

This FGD dialing plan is referred to as a called party billable call. This means that originating agents that use this FGD dialing plan bill the called party for the call. There is no ANI screening possible with this dialing plan. An example is FGD Pure dialing 800 INWATS numbers. Note that 800 calls only examine the originating NPA of the ANI.

FGD billing calls with specifiable billing

This FGD dialing plan can be either FGD calling party by ANI or FGD called party billable. This means that whether the originator or terminator is billed for the call depends on datafill (specifically field BILLPTY in table N00PXLA). ANI screening may or may not be possible with these dialing plans. This is dependent upon field BILLPTY in table N00PXLA and field ANISCREN in table TRKGRP. Examples of these are FGD Pure with 700 Dialing and FGD Pure with 900 Dialing.

IBN MF signaling (FGD protocol)

IBN MF PTS agents using the FGD protocol typically outpulse two stages using in-band signaling in the multi-frequency (MF) format. The first stage is referred to as the ANI spill. A typical ANI spill contains two subfields: information digits (2-digits) and calling party's number (10-digits).

The second stage is referred to as the CALLED party's number and usually contains the destination digits (also known as the terminating station number).

IBN MF (FGD) signaling incoming, IBN ISUP SS7 outgoing

IBN ISUP SS7 agents handle various CPI information during the call establishment phase in their Initial Address Message (IAM). Specifically, there are mandatory and optional parameters of the IAM that are utilized for this purpose. The mandatory parameters are:

- Message Type
- Nature of Connection Indicator
- Forward Call Indicator
- Calling Party's Category
- User Service Information (formerly Bearer Capability)
- Called Party Number

IBN MF (FGD) signaling incoming, IBN ISDN PRA outgoing

IBN ISDN PRA agents handle various CPI information during call establishment in their SETUP messages. Many of the parameters are very

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Feature group D ANI delivery (continued)

dynamic, that is, they change a lot during call processing. The mandatory SETUP message parameters are:

- Protocol Discriminator
- Call Reference
- Message Type
- Bearer Capability
- Channel Identification

Control of calling party information (ANI) transmittal

Originating group control

The first step in specifying whether or not ANI information is mapped to terminating agents possessing CPI information is to specify that field ANIDIGS in table TRKGRP must be set to "Y" for incoming IBN MF PTS trunks using the FGD protocol. If field ANIDIGS in table TRKGRP is set to "N", ANI to CPI mapping is not possible for any calls traversing the IBN MF PTS (FGD) trunking facility regardless of dialing method used.

Originating station control

The following points outline ways the originating station can control calling party information (ANI) transmission:

- Calling Party Billable By ANI—because some off-net callers arriving through an IBN MF PTS trunk using the FGD protocol may not want their ANI information used for display purposes by downstream agents possessing CPI information, regardless of how field ANIDIGS in table TRKGRP is datafilled, the option as to whether or not ANI information is displayed by downstream agents possessing CPI information is specifiable on a per-station basis to those FGD agents using FGD calling-party-billable-by-ANI dialing plans.
- Calling Party Billable By Authcode/TCN—because these calls are not subject to ANI screening, their suppression on a per-station basis is not supported. Instead, an office parameter entitled FGD PTS CUTTHRU ANI SUPPRESSION, which can be found in table OFCVAR is provided to determine whether or not the caller's ANI information is displayable to terminating agents. The range of values for this office parameter is ALWAYS or NEVER.
- Called Party Billable—because the terminating station is billed for called-party-billable calls, ANI station suppression on a per-station basis is not supported (i.e. the caller has no control). Instead, ANI information is provided (assuming it is available).

AD2175**Feature group D ANI delivery** (continued)**Terminating group control of ANI**

The following points outline issues regarding terminating group control of calling party information (ANI) transmission:

- IBN ISUP SS7 Terminating Trunk Agents—there is no terminating control for terminating IBN ISUP SS7 trunking agents to control whether or not certain fields are supplied or not supplied in the IAM message during call establishment.
- IBN ISDN PRA Trunks Connected to On-net Configurations—there is no terminating control for terminating IBN ISDN PRA trunking agents to control whether or not certain fields are supplied or not supplied in the IAM message during call establishment for on-net paths.
- IBN ISDN PRA Trunks Connected to Off-net Configurations—for IBN MF PTS (FGD) calls that terminate on IBN ISDN PRA trunks traversing off-net paths, whether the Called Number parameter and/or Calling Number parameter are omitted from the SETUP message during the call establishment phase of the call is controlled through table control. Specifically, field Calling Number Delivery (CGNDELV) and Called Number Delivery (CDNDELV) in table LTDATA with the DATATYPE refinement specified as SERV for the terminating IBN ISDN PRA trunking agent, provides the capability to control delivery of these fields in the SETUP message. The Calling Party Number (CGN) and Called Party Number (CDN) information elements in the SETUP message are optional per subscription.

Hardware requirements

Feature Group D ANI Delivery has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Feature Group D ANI Delivery:

- Field ANIDIGS in table TRKGRP controls whether or not ANI information is mapped by the IBN MF PTS (FGD) trunk. In order to map ANI information into the CPI information of terminating IBN ISUP SS7 or IBN ISDN PRA trunking agents, field ANIDIGS must be set to “Y” for the originating IBN MF PTS (FGD) trunk. ANI to CPI mapping is not possible if field ANIDIGS in table TRKGRP is not set to “Y”.
- The Originating Line Information Parameter, Calling Party Number Parameter, and Charge Number Parameter of the IBN ISUP SS7 IAM message is not provided if field ANIDIGS in table TRKGRP is set to “N”

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Feature group D ANI delivery (continued)

(No) for incoming and 2-way IBN trunk group types using the FGD protocol.

- ANI Station Suppression (i.e. calls with field SUPPRESS in table FGDANISC datafilled with a "Y") on a per-station basis is only available to originating callers that use FGD calling-party-billable-by-ANI dialing plans that have both field ANIDIGS and ANISCREN in table TRKGRP set to "Y". Otherwise, ANI information may be displayable.
- Calling-party-billable-by-Authcode/TCN calls that have office parameter, FGD_PTS_CUTTHRU_ANI_SUPPRESSION, set to "NEVER" are displayable by terminating agents if the ANI is provided. This includes off-net originators (i.e. subscribers in the public network) with unlisted numbers.
- Because calling-party-billable-by-Both-Calling-Methods calls may actually traverse two levels of screening (i.e. screening by ANI and screening by Authcode/TCN), there is the potential for ambiguities to exist in defining the ANI suppression function. In this case, screening is similar to the calling-party-billable-by-ANI method (i.e. via field SUPPRESS in table FGDANISC). This means that the contents of office parameter, FGD_PTS_CUTTHRU_ANI_SUPPRESSION, are ignored for this one exception cut-thru case.
- Called-party-billable calls are displayable by terminating agents if the ANI is provided. This includes off-net originators (i.e. subscribers in the public network) with unlisted numbers.
- Calls requiring Service Access Codes (SAC) dialing or test call dialing are not supported by this feature.
- This feature does not provide ANI information to operator services agents.
- For FGD calling-party-billable calls, the address contained within the Charge Number parameter and the Calling Number parameter are treated as the same value (i.e. both parameters contain the ANI). This means that in a few call scenarios, the number presented to a terminating agent as the calling number (known as Number Display or Calling Line Identification [CLID]) may actually be the address of the PBX from which the calling number originated; not the address of the originating station.
- Name Display and Network Name Display only works for on-net calls (i.e. calls that originate and terminate on the same network). By design, incoming IBN MF PTS FGD protocol calls arrive from an off-net origination (i.e. the public network) and terminate on-net. Therefore, Name Display and Network Name Display do not work with this feature.

AD2175**Feature group D ANI delivery** (continued)**Interactions**

The following paragraphs describe the interactions between Feature Group D ANI Delivery and other functionalities.

MSN SMDR billing

Field MSN ANI MAPPING is contained within the MSN extension record of the station message detail recording (SMDR) billing record. This field identifies whether or not ANI information provided to the terminating IBN ISUP SS7 or IBN ISDN PRA trunking agents is displayable for the purposes of supplying CLID information to further downstream terminating agents.

Reorigination feature

This feature, by design, allows the second leg of a call (traversing MONA) to be disconnected without the requirement to regain access to the MSN (the first leg). Care is exercised to ensure that successive reoriginations receive the proper ANI information digits and ANI suppression information (supplied in the first leg) in the originating address of each and every subsequent leg call.

Call transfer / call forward / three way call

Calls arriving from off-net sources through an IBN PTS MF (FGD) trunk that terminate (first leg) to an IBN set (including Attendant Consoles) and then are subsequently extended by the IBN set by using the Call Transfer / Call Forward / Three Way Call feature to an additional destination, do not pass the original ANI to the terminator of the extended call. Instead, the display of the terminator of the extended call contains the ANI of the originator of the extended leg of the call. Also, if the originator of the extended leg of the call leaves the call, the display of the terminator of the extended leg of the call is not updated with the ANI of the originator of the original leg of the call.

Conference calls / preset conference

This feature does not interact with conferencing features.

Datafill**FGD calling party billable by ANI calls**

Table FGDANISC contains the field SUPPRESS. This field controls whether or not off-net originated stations entering the network via an IBN MF PTS (FGD protocol) using pure dialing and ANI screening wish to have their ANI information suppressed, thereby preventing the display of their DN's on a per line (specified by the ANI calling number) basis. Individuals wishing to have their ANI information made available to downstream agents may have their ANI information provided by entering an "N" in field SUPPRESS. Conversely, individuals not wishing to have their ANI information made

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Feature group D ANI delivery (end)

available to downstream agents may have their ANI information suppressed by entering a "Y" in field SUPPRESS.

FGD calling party billable by authcode/TCN calls

A new office parameter, FGD PTS CUTTHRU ANI SUPPRESSION, is added to table OFCVAR and has a range of values of ALWAYS and NEVER. This office parameter controls whether or not off-net originated stations entering the network through an IBN MF PTS (FGD protocol) trunk using a cut-thru dialing plan (i.e. 800 Universal Access, FGB, or FGD Cut-Thru dialing) wish to have their ANI information suppressed, thereby, preventing the display of their DN's. Individuals wishing to have their ANI information made available to downstream agents may have their ANI information provided by entering a "NEVER" in this office parameter. Conversely, individuals not wishing to have their ANI information made available to downstream agents may have their ANI information suppressed by entering an "ALWAYS" in this office parameter.

Description of changed or new fields

A field is provided (SUPPRESS Y or N) to control whether or not off-net originated stations entering the network through an IBN MF PTS (FGD protocol) trunk using pure dialing wish to have their ANI information suppressed, thereby, preventing the display of their directory numbers. Individuals wishing to have their ANI made available to downstream agents may have their ANI information provided by entering an "N". Conversely, individuals not wishing to have their ANI information made available to downstream agents may have their ANI information suppressed by entering a "Y".

Service orders

Feature Group D ANI Delivery does not affect SERVORD.

Operational measurements

Feature Group D ANI Delivery does not affect operational measurements.

Logs

Feature Group D ANI Delivery does not affect logs.

User interface

Feature Group D ANI Delivery does not change the user interface.

Billing

Feature Group D ANI Delivery does not affect billing.

AD2185**MSN travel card call processing****Functionality name**

MSN Travel Card Call Processing

Description

This feature allows Meridian SuperNode (MSL-100) subscribers to charge calls to a 14-digit travel card number (TCN). After accessing the MSL-100 switch, the subscriber can enter 0 to select a domestic call or 01 to select an international call, followed by the destination number, then the TCN. The subscriber places a call in the following manner:

ACCESS <SDT> +0+ Address Digits +<PT>+ TCN + (<DT>+AC) +<CT>

or

ACCESS <SDT> + 01 + International Address Digits + <PT> +TCN + (<DT> + AC) + <CT>

where

- TCN is travel card number
- AC is account code
- SDT is special dial tone
- DT is dial tone
- PT is prompt tone
- CT is confirmation tone
- () is optional

Digit Collection

A travel card call consists of two stages of digit collection. The first stage is the address digits followed by a prompt tone. The second stage is the travel card digits followed by a confirmation tone.

FIRST STAGE**SECOND STAGE**

<SDT> (address digits) <PT> (travel card digits) <CT>

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MSN travel card call processing (continued)

Address Digits

The address digits are in one of two forms, depending on whether a domestic or international call is being dialed.

Domestic Dialing

Destination Digits is any dialing plan provided by Meridian OffNet Access (MONA). Since destination digits is a variable length of digits, the end of dialing for this stage is assumed when either an interdigital timeout occurs, or when a DTMF end-of-dialing digit “#” is received.

0 + destination digits + (#)

International Dialing

Since destination digits is a variable length of digits, the end of dialing for this stage is assumed when either an interdigital timeout occurs or when a DTMF end-of-dialing digit “#” is received.

01 + CC + NN . . N + (#)

where

- CC is country code
- NN is national number (0 . . 9)
- (#) is optional DTMF pound sign end of dialing digit

Travel Card Digits

The travel card number (TCN) must be a 14-digit number in the form of:

NXXXXXXXXXXXXX

where

- N = 2 through 9
- X = 0 through 9

The end of dialing for a TCN is assumed when either an interdigital timeout has occurred or when 14 digits have been received. The DTMF “#” sign should not be used to signify the end of the digit.

The validity of the TCN is checked in table MSNTCN of the database. If it is found to be valid, the call is routed. If an account code is required with the TCN (defined in table MSNTCN), then the user must wait for the provided dial

AD2185**MSN travel card call processing** (continued)

tone before entering the account code. The caller will get treatment if they fail to wait for the dial tone.

After all travel card digits are collected (and account code if required) and the TCN verified, the subscriber receives a confirmation tone indicating that the call is progressing. A new network class of service (NCOS) is obtained from the travel card database and is used to translate the call.

Breaking Prompt Tone

The subscriber does not need to wait for the prompt tone before dialing the TCN if an optional “#” is entered at the end of the address digits. The first travel card digit stops the prompt tone. If the subscriber does not pause after the address digits, then no prompt tone is generated at all.

Treatments

Travel card call processing uses several treatments to which the subscriber is routed if an error condition occurs. These are three possible treatments:

- **FDNZ**—First Digit Not Zero. This treatment is given on TCN call reorigination when the subscriber fails to dial zero (or 01 for international) before the address digits.
- **CCTO**—Calling Card Time Out. This treatment is given when the subscriber fails to enter a TCN digit within 10 seconds, at which point the travel card times out.
- **CCNV**—Calling Card Not Valid. The subscriber receives this announcement when the TCN is invalid.

When routed to one of these treatments, one needs to hang up and try again.

Tones

The following two tones are used for information purposes:

- **Travel Card Prompt Tone**—This is a regular tone sent after the subscriber successfully dials the first stage of digits (address digits). The subscriber enters the TCN after the prompt tone and this tone stops upon the receipt of the first travel card digit.
- **Travel Card Confirmation Tone**—The subscriber receives this tone after the TCN or account code has been validated. This tone is actually two regular dial tones separated by a period of silence.

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MSN travel card call processing (continued)

Hardware requirements

While both UTR and DTMF receivers are supported by this feature, UTR support is available only if this feature interacts with call reorigination.

Limitations and restrictions

The following limitations and restrictions apply to MSN Travel Card Call Processing:

- TCNOPT option has to be set for Meridian OffNet Access DN for travel card dialing.
- Operator assisted travel card dialing is not supported.
- Travel card dialing is supported for Feature Group A, Feature Group B, Feature Group D cut-through, 800 Universal Access, Direct Access Trunk cut-through, and Meridian OffNet Access.
- Since the digit 0 (zero) is used to determine a travel card call when it is dialed as the first digit, it is not to be used as the first digit for authorization code dialing. In other words, for authcode dialing, the first digit of the authcode cannot be zero.
- The DTMF “#” sign should not be used to signify the end of digit for the travel card number.
- If account code is required with the travel card number, then the subscriber must wait for dial tone before entering the account code. If the subscriber fails to wait for dial tone, then routing to treatment results.
- The subscriber is restricted to making TCN calls on reorigination after a TCN call.
- On reorigination, the subscriber must re-enter 0 (zero).
- The travel card number database is an in-switch database.
- Table CUSTSMR must have option TCN if billing is required.
- The travel card number must be in DTMF.
- For a domestic travel card call, the first digit of the destination cannot start with the digit 1.

Interactions

The following paragraphs describe the interactions between MSN Travel Card Call Processing and other functionalities.

AD2185**MSN travel card call processing** (continued)**Reset Dialing**

The reset digit (*) provides the subscriber with the capability to start the digit collection process over. For the travel card call, the following three rules apply to reset the digit feature:

- Selecting a reset digit in the first stage (address digits) of the digit collection returns the subscriber to special dial tone where a TCN or authcode call can be initiated.
- Selecting a reset digit button in the second stage (travel card digits) of the digit collection returns the subscriber to the prompt tone where the TCN can be reentered.
- When the subscriber selects the reset digit after dialing the address digits during TCN call reorigination, 0 (zero) plus the address digits must be reentered. In other words, TCN calls must be made when reset dialing is used with TCN call reorigination.

Call Reorigination

The call reorigination feature provides the caller with the ability to chain several calls together without redialing MSN access number and travel card digits. Reorigination is allowed based upon the field REORG = Y in the TRKGRP data.

The subscriber can reoriginate a TCN call in the following manner:

"*" or "#" + 0 + Address Digits + (Dial Tone + Account Code) + Confirmation Tone

This feature interacts with call reorigination as follows:

- The subscriber is restricted to making TCN calls on reorigination after a TCN call.
- The subscriber does not need to redial the TCN digits. The only digits that are expected are 0 (zero) and the address digits of the new call.
- The subscriber has to reenter the account code on reorigination calls if account code is required with TCN calls.
- After the address digit collection is over (and the account code is collected if required), the subscriber receives confirmation tone if the address digits are valid (and if the account code are valid).
- Reorigination is disabled for calls that go to treatment because of a dialing error.

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MSN travel card call processing (end)

Datafill

Add the new option TCNOPT to table DNROUTE for the MONA feature to provide travel card dialing.

Add the new option TCN to table CUSTSMR to control the generation of the new SMDR extension record for TCN calls.

There is no need to add the TCN during Dump and Restore as it is optional to table CUSTSMR.

Service Orders

MSN Travel Card Call Processing does not affect SERVORD.

Operational measurements

MSN Travel Card Call Processing does not affect operational measurements.

Logs

MSN Travel Card Call Processing does not affect logs.

User interface

MSN Travel Card Call Processing does not change the user interface.

Billing

Option TCN is added to table CUSTSMR to provide travel card billing. This results in the creation of a new SMDR Extension Record Format (#DC) with the following fields:

- Record Code—Value #DC. This is a two-character code that identifies the TCN SMDR Extension Record.
- TCN Digits—This is a 14-digit field that contains the TCN entered by the subscriber.
- TCN Validation—This is a one-digit field that contains information dealing with the TCN. The three possible values are:
 - Valid TCN (3)
 - Invalid TCN (4)
 - TCN Timeout (5)

AD2186**Private speed calling and hotline dialing****Functionality name**

Private Speed Calling and Hotline Dialing

Description

This feature provides the Meridian SuperNode (MSN) with Private Speed Calling and Hotline Dialing. Private Speed Calling provides the caller with the capability to associate speed-call numbers with their authorization code, thus providing an abbreviated form of dialing. Hotline Dialing provides a caller with another form of abbreviated dialing. Three types of Hotline Dialing are offered: Trunk Group Hotline, Authorization Code Hotline, and Conditional Hotline.

Private Speed Calling

Private Speed Calling provides a caller with an abbreviated form of dialing by allowing them to associate a list of speed-call numbers with an authcode (authorization code). Each speed-call number represents a number to which the call is routed when the associated speed-call number is dialed. The number associated with the speed-call number may be any number accessible by the caller using their dialing plan. Up to 64 speed-call numbers may be associated with each authcode.

Before dialing a private speed call number, a caller must first receive dial tone. After being prompted by the tone, the caller must enter an authcode. The caller then receives regular dial tone and may then dial the desired private speed call number.

The format for Private Speed Calling dialing is as follows:

ACCESS + <SDT> + AUTHCODE + (PIN) + (AC) + <RDT> + 1NN + (<SDT> + AC)

where

- <SDT> is special dial tone (MSN dial tone)
- AUTHCODE is the caller's authorization code
- PIN is the caller's personal identification number
- AC is the caller's account code
- <RDT> is regular dial tone
- N is a number in the range 2 to 9
- items in parenthesis are optional

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Private speed calling and hotline dialing (continued)

The collection of PIN digits and account codes are optional.

Association between speed call numbers and authcodes

If a customer group uses authcodes, then an authpart must be assigned to that customer group in Table CUSTHEAD (there is no additional discussion of Table CUSTHEAD in this feature description). This datafilled authpart is used to define the characteristics, such as format and length, of the authcodes for that customer group. These characteristics are defined through the datafill of Table AUTHPART.

When authcodes are datafilled in Table AUTHCDE, they are datafilled against the authpart of the customer group by which they will be used. Therefore, each authcode is associated with a certain authpart.

A given set of speed-call numbers is associated with a particular authcode. However, since an authcode is associated with a certain authpart, that set of speed-call numbers is actually associated with an authpart/authcode combination, rather than solely being associated with an authcode. This fact is transparent to the user. The user perceives that the private speed-call list is associated with their authcode.

Multiple use of speed call lists

One private speed call list may be used by several authcodes. This would be implemented by datafilling the same private speed call index for each authpart/authcode combination in Table AUTHCDE, which is to use the private speed-call list associated with the datafilled private speed-call index.

Ambiguous dial plans

The possibility exists for ambiguity between private speed call numbers and other numbers valid in a customer's dial plan. For example, a dial plan may be set up to have 3-digit extension dialing. If the first digit of an extension is "1", this extension may look like a private speed call number. This section explains how this type of ambiguity is handled.

If a caller dials "1NN" and does not have private speed calling capability, then "1NN" is sent to translations. Translations routes the call accordingly.

If a caller dials "1NN" and has private speed calling capability, Table PSCNUM is searched using the private speed-call index (PSCIDX) associated with the caller's authcode and the private speed-call number "NN". If an entry is found in the table, the call routes to the destination digits associated with this private speed-call number. However, if an entry is not found, the call is treated as if the caller did not have private speed calling capability.

AD2186**Private speed calling and hotline dialing** (continued)**Hotline Dialing****Trunk Group Hotline**

This feature provides the capability for a caller to dial a local exchange number and reach a destination associated with the incoming trunk group. This incoming group is the trunk group over which the call was routed from the LEC (Local Exchange Carrier) to the Meridian SuperNode.

The format for Trunk Group Hotline Dialing is as follows:

NXXXXXX

where

- N is in the range of 2 to 9
- X is in the range of 0 to 9

Authorization Code Hotline

Authorization Code Hotline, or Authcode Hotline, is a form of dialing that allows callers to dial an authcode after gaining access to the MSN and then be routed to an on-net or off-net destination without dialing destination digits. The call is routed to the hotline number associated with the authcode dialed by the caller using the translation scheme defined by the customer group of the Meridian Off-net Access (MONA) Directory Number (DN), which was used to gain access to the MSN network and the NCOS datafiled against the dialed authcode.

The format for Authcode Hotline Dialing is as follows:

ACCESS + <SDT> + AUTHCODE + (AC)

where

- <SDT> is special dial tone (MSN dial tone)
- AUTHCODE is the caller's authorization code
- AC is the caller's account code
- <RDT> is regular dial tone
- N is a number in the range 2 to 9
- items in parenthesis are optional

The collection of account codes is optional.

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Private speed calling and hotline dialing (continued)

Conditional Hotline

Conditional Hotline provides the caller with the option of either dialing destination digits or allowing digit collection to time out and letting the call get routed to a predefined destination. This feature is invoked after the user has gained access to the MSN network. If digits are received before digit collection times out, then the call is treated as a non-hotline, or a regular, call. However, if digit collection times out and a hotline route is associated with the access digits that invoked MSN dial tone, the call is routed to the hotline route. The default hotline route is to an attendant console. This default can be overridden with any other route that has been set up in the MSN routing tables OFRT or IBNRTE.

An authcode can be required after gaining access to the MSN network. Whether or not an authcode must be dialed by the caller is specified via datafill. If an authcode is required, it must be dialed after access to the MSN network has been obtained and the caller has received special dial tone. If digit collection times out before the required authcode is dialed, then the call is routed to the conditional hotline route. If, however, the authcode is dialed, the caller receives regular dial tone after dialing an authcode. The caller then either dial destination digits or let digit collection time out and let the call get routed to the hotline route.

Accessing the MSN network

A caller can access the MSN network via one of the following access methods:

- FGA (Feature Group A)
- FGB (Feature Group B)
- FGD (Feature Group D) cut-thru: FGD EAP (Equal Access Plan) or FGD INTERIM
- DAT
- 800 UA (Universal Access)

After dialing one of the access numbers, the Meridian SuperNode returns dial tone.

Note that all access methods specified here invoke MONA for collection of destination digits and optional authorization and account codes. Private Speed Calling and Authcode Hotline require dialing an authcode. Therefore, for these features the datafill of the MONA tuple used to gain access to the MSN network must specify that an authcode is required.

AD2186**Private speed calling and hotline dialing** (continued)

If the datafill specifies that an authcode is not required, then neither the Private Speed Calling nor the Authcode Hotline feature may be invoked.

The Conditional Hotline feature does not require dialing an authcode. Therefore, the AUTHREQ field in Table DNROUTE may be datafilled "Y" or "N" for the MONA tuple used by this feature to gain access to the network.

Hardware requirements

Private Speed Calling and Hotline Dialing has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Private Speed Calling and Hotline Dialing:

- Private speed call numbers are collected in dual tone multi-frequency (DTMF) format.
- Private Speed Calling (PSC) and Authorization Hotline Dialing are mutually exclusive. Therefore, if the PSC option is added to table AUTHCDE for a particular authcode, the HOTLINE option may not be added for that authcode. Likewise, if the HOTLINE option is added to table AUTHCDE for a particular authcode, the PSC option may not be added for that authcode.
- Trunk Group Hotline is not supported for DAT FXS (Foreign Exchange Station Side) ground start trunks.

Interactions

The following paragraphs describe the interactions between Private Speed Calling and Hotline Dialing and other functionalities.

Account Codes

Account codes may be required for both private speed calls and hotline calls, depending on datafill. If required, an account code may be collected in one of two ways for private speed calls: either with the authcode or after the destination digits. For hotline calls, an account code may be collected with an authcode. Account codes are not verified for content, but for length.

Two methods can be used to specify that an account code must be collected last. Either method is used in order to collect an account code with the Private Speed Calling feature. One method specifies that an account code must be collected based on the authcode dialed, the other, on the route taken.

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Private speed calling and hotline dialing (continued)

PIN Digits

PIN digits are optional for private speed calling, depending on datafill. If they are required, they are collected as follows:

ACCESS + <SDT> + AUTHCODE + PIN + <RDT> + 1NN

PIN digits are not required or collected with trunk group hotline dialing and authcode hotline dialing.

PIN digits are optional for conditional hotline dialing, depending on datafill.

Reset Dialing

Reset dialing can be performed on private speed calls during the collection of the authcode, the account code, or the private speed call number.

Reset dialing can be performed on authcode hotline calls during the collection of the authcode.

If an authcode is required for a conditional hotline call, reset dialing can be performed on that call during the collection of the authcode.

Reorigination

A private speed call number may be dialed as the destination digits of a reoriginated call if the authcode that was previously dialed has the Private Speed Calling option. The requirement for this functionality is that the MSNs have SMDR billing.

A private speed call can be reoriginated. In other words, once a private speed call has terminated, the Reorigination feature can be used to dial another private speed call number or other destination digits.

Datafill

Table PSCNUM

A new table, PSCUM, is created to store all the private speed call numbers for the Meridian SuperNode Private Speed Calling feature. The table has a double index. The first index is the private speed call index that associates the private speed call number with an authcode. The second index is the private speed call number that the caller dials. Destination digits are datafilled for each entry. These digits are the number to which the call is routed when the private speed call number is dialed for the authcode corresponding to the private speed call index.

AD2186**Private speed calling and hotline dialing (continued)**

The following is a description of changed or new fields:

- **PSCIDX**—Private Speed Call Index that is datafilled in table AUTHCDE. This number associates a private speed call number with a particular authcode. Up to 5000 private speed call indices may be datafilled in table PSCNUM. The value of this field may range from 0 to 4999. Note that the PSCIDX subfield of the PSC option datafilled in table AUTHCDE must also contain a number in the range of 0 to 4999 since the same number should be datafilled in both tables for a particular speed call list.
- **PSCNUM**—Private Speed Call Number that the caller dials. This number is in the form NN where N is a number from 2 to 9. Up to 64 private speed call numbers may be datafilled for each private speed call index. Thus each authcode contains a private speed call list of up to 64 speed call numbers.
- **DESTDIGS**—Destination Digits. The actual number to which the private speed number terminates. These digits can be any number within the translation scheme available to the caller, either within the customer's private network or in a connecting private or public network. The number consists of the digits 0 to 9 and is from 1 to 18 digits in length. Note that private speed call numbers are not programmable by the caller, but must be datafilled by data entry personnel.

No table dependencies exist for the datafill of this table. The minimum size of this table is 0 tuples and the maximum size is 320,000 tuples.

Table AUTHCDE

A new field, **OPTIONS**, is added to table AUTHCDE by this feature. In addition, two new options, **PSC** and **HOTLINE**, are added as valid options for the **OPTIONS** field of table AUTHCDE. The **PSCIDX** subfield of the **PSC** option contains the private speed call index associated with an authcode for the Private Speed Calling feature. The **HOTLNUM** subfield of the **HOTLINE** option contains the directory number associated with an authcode for the Authorization Code Hotline feature.

The following is a description of changed or new fields:

- **OPTIONS**—Options. Contains authcode options.
- **PSCIDX**—Private Speed Call Index. The index into table PSCNUM. This number associates an authcode with a private speed call list. This field appears only when **PSC** is datafilled in the Options field.
- **HOTLNUM**—Hotline number. The hotline number associated with this authcode. This field appears only when **Hotline** is datafilled in the Options field.

AD2186**Private speed calling and hotline dialing** (continued)

No new table dependencies have been created by the changes made to this table. Also, this feature does not change the number of tuples that are datafilled in table AUTHCDE. However, a limited number of authcodes may contain options. Note that a "\$" should be appended to the end of each IBN authcode tuple in this table.

Table TRKGRP

BILLDIGS has been added as a valid option for the OFNTOPT subfield of field OFFNET. OFNTOPT is a subfield created by the Meridian SuperNode Dedicated Access Trunk Interface feature.

The following is a description of changed or new fields:

- OFNTOPT—Off-Net options. A new option, BILLDIGS, has been added to this subfield.
- DIGITS—Digits. Contains billing digits for Trunk Group Hotline calls. This field appears only when BILLDIGS is datafilled in the OFNTOPT field.

No new table dependencies were created by the changes made to the table.

Table DNROUTE

A new option CONDHL has been added as a valid option for the MONAOPT field in table DNROUTE. This option contains two subfields: TBLNAME and IDX, which contains the table name and index into the table that specifies a conditional hotline route for a particular access directory number.

Datafill this table after the table specified in subfield TBLNAME is datafilled. This is due to the need for a valid table entry specification in the subfields of option CONDHL.

The following is a description of changed or new fields:

- MONAOPT—MONA options. A new option, CONDHL, is added to this field.
- TBLNAME—Table Name. The routing table in which the conditional hotline route is datafilled. This subfield appears only when CONDHL is datafilled in the MONAOPT field.
- IDX—Index. The index into the routing table specified in subfield TBLNM. When TBLNAME is indexed with IDX, the desired conditional hotline route is obtained. This subfield appears only when CONDHL is datafilled in the MONAOPT field.

AD2186**Private speed calling and hotline dialing (end)**

Service Orders

Private Speed Calling and Hotline Dialing does not affect SERVORD.

Operational measurements

Private Speed Calling and Hotline Dialing does not affect operational measurements.

Logs

Private Speed Calling and Hotline Dialing does not affect logs.

User interface

Private Speed Calling and Hotline Dialing does not change the user interface.

Billing

A BILLDIGS field is added to the Meridian SuperNode SMDR extension record.

With the Private Speed Calling feature, the private speed call number, NN, is not recorded in the SMDR (Station Message Detail Recording) record. Instead, the destination digits associated with the private speed call number is recorded in the CALLED_DR field of the SMDR record.

With the Hotline Dialing feature, the number datafilled in the DIGITS subfield of the BILLDIGS option in table TRKGRP is the number to which trunk group hotline calls are charged. This number is recorded in the new BILLDIG field of the MSN SMDR extension record. If the BILLDIGS option is not datafilled in table TRKGRP for a trunk group hotline, then no billing number is recorded for hotline calls over that trunk group.

With the Authorization Code Hotline feature, normal SMDR billing is recorded for Authcode Hotline calls. The hotline number is recorded in the CALLED_DR field of the SMDR record.

AD2468

NSS ANI Delivery

Functionality name

NSS ANI Delivery

Description

The NSS ANI Delivery feature provides mapping of Automatic Number Identification (ANI) information to various Network Services Software (NSS) agencies for the purpose of delivering calling party information (CPI).

Hardware requirements

NSS ANI Delivery has no hardware requirements.

Limitations and restrictions

The following categories of limitations and restrictions apply to NSS ANI Delivery:

- general restrictions
- originating restrictions
- terminating restrictions

General restrictions

The following general limitations and restrictions apply to NSS ANI Delivery:

- It is the responsibility of the datafill coordinator to ensure that the proper values are contained within field BILLDN. (Since the contents of field BILLDN in table TRKGRP are used for ANI mapping, invalid entries in field BILLDN are propagated across the network and are not blocked. Entries should contain the address of the PBX from which the calling number originated and the address of the originating station.)
- Calls that have the offnet option, ANIDELV, datafilled are displayable by terminating agents. This includes offnet originators with unlisted numbers. It is the responsibility of the terminating network to determine if the calling party's ANI is displayable by terminating agents possessing this capability.
- Calls requiring service access codes (SAC) dialing or test call dialing are not supported. This includes the service code parameter of ISDN User Part (ISUP) Signaling System 7 (SS7) Intelligent Address Message (IAM) messages.
- ANI information to operator services agents from per trunk signaling (PTS) originators is not supported.

AD2468**NSS ANI Delivery** (continued)

- Name display and network name display only work for on-net calls (calls that originate and terminate on the same network).
- Calls terminating to access to carrier (ATC) per trunk signaling (PTS) MF do not interpret ANI suppression indicators. Applicable originating NSS PTS agents that have requested suppression of their ANI (by any method) are overridden if the call terminates to an ATC PTS MF Feature Group D (FGD) trunk.
- The terminating billing option (TBO) is not available for station message detail record (SMDR) billing records. If TBO is required, then AMA billing records should be used.
- Calls terminating to either ATC PTS MF (FGD) or ATC ISUP SS7 must use equal access translations. Failure to use equal access translations for ATC ISUP SS7 will result in various optional parameters not being assembled.

Originating restrictions

The following originating limitations and restrictions apply to NSS ANI Delivery:

- IBN PTS regular trunk originations (non-NSS)
- IBN PTS (FGA) trunk originations
- IBN PTS MF (FGB) trunk originations
- IBN PTS MF (FGD) trunk originations
- ATC PTS MF (FGD) trunk originations
- Dedicated access trunk (DAT) PTS trunk originations

IBN PTS regular trunk originations (non-NSS)

ANI Delivery using a regular IBN PTS (non-NSS) trunk is not supported. This also includes NSS PTS trunks with an OFNTACTYP in table TRKGRP of IBN.

IBN PTS (FGA) trunk originations

The number supplied as the CALLING party information is taken from field BILLDN in table TRKGRP for the incoming integrated business network (IBN) PTS (FGA) trunk and is not the usual ANI spill information supplied. In this case, "00" is padded in the information digits of terminating agents that require this information.

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NSS ANI Delivery (continued)

Name display and network name display only work for on-net calls. Calls delivered to the network using IBN PTS (FGA protocol) trunks do not have these capabilities.

IBN PTS MF (FGB) trunk originations

Field ANIDIGS in table TRKGRP controls whether or not ANI information is to be mapped by the IBN MF PTS (FGB) trunk. To physically map ANI information into the CPI information of terminating IBN ISUP SS7 or IBN ISDN PRA trunking agents, field ANIDIGS must be set to Y. If field ANIDIGS is set to N then datafill supplied in field BILLDN for table TRKGRP is used as the ANI. If field ANIDIGS contains a Y, field BILLDN must contain an N.

The digits contained within field CONNGNPA can only be appended to physically received ANI digits and have no interactions with the ANI substitution method of providing an ANI using datafill in field BILLDN of table TRKGRP.

The Charge Number parameter of the ISUP SS7 IAM message contains the same fields as the Calling Party Number parameter (minus the presentation restricted indicator).

IBN PTS MF (FGD) trunk originations

Field ANIDIGS in table TRKGRP controls whether or not ANI information is to be mapped by the IBN MF PTS (FGD) trunk. To map ANI information into the CPI information of terminating ISUP SS7 or ISDN primary rate access (PRA) trunking agents, field ANIDIGS must be set to Y for the originating IBN MF PTS (FGD) trunk and field BILLDN must be set to N. ANI to CPI mapping is not possible if field ANIDIGS in table TRKGRP is not set to Y.

When incoming IBN PTS MF (FGD) trunk originations terminate to ISUP SS7 trunks, the parameters originating line information, calling party number and charge number of the ISUP SS7 IAM message are not provided if field ANIDIGS in table TRKGRP is set to N for incoming and two-way IBN trunk group types using the FGD protocol.

ANI station suppression on a per-station basis is only available to originating callers that use the FGD calling party billable by ANI dialing plans that have fields ANIDIGS and ANISCREN in table TRKGRP set to Y. Whether or not ANI information is displayed depends on our ANI trunk group control suppression indicator. Also, the FGD calling party billable by ANI calls that are screened using table FGDANISC and allow ANI Delivery may still be

AD2468**NSS ANI Delivery** (continued)

overridden if offnet option, ANIDELV, is omitted from the table TRKGRP datafill.

The FGD called party billable calls are displayed by terminating agents when the ANI is provided. This includes offnet originators with unlisted numbers.

The Charge Number parameter of the ISUP SS7 IAM message contains the same fields as the Calling Party Number parameter when incoming IBN PTS MF (FGD) trunk originations involve FGD calling party billable calls.

ATC PTS MF (FGD) trunk originations

PTS signaling does not transmit ANI spill information. Therefore, originating ATC PTS MF (FGD) trunk calls do not supply CPI information to downstream agents. ATC trunks are used for terminations only.

DAT PTS trunk originations

The number supplied as the calling party information is taken from field BILLDN in table TRKGRP for the incoming DAT PTS trunk and is not the usual ANI spill information supplied (there are no ANI information digits). In this case, "00" is padded in the information digits of terminating agents that require this information.

Name Display and Network Name Display only work for on-net calls. Calls delivered to the network using DAT PTS trunks do not have these capabilities.

Terminating restrictions

The following terminating limitations and restrictions apply to NSS ANI Delivery:

- IBN PTS MF (FGA) trunk terminations
- IBN PTS MF (FGB) trunk terminations
- IBN PTS MF (FGD) trunk terminations
- ATC PTS MF (FGD) trunk terminations
- IBN ISUP SS7 trunk terminations
- IBN ISDN PRA trunk terminations
- ATC ISUP SS7 trunk terminations
- DAT PTS trunk terminations
- DAT ISDN PRA trunk terminations

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NSS ANI Delivery (continued)

IBN PTS MF (FGA) trunk terminations

PTS signaling does not transmit ANI spill information. Therefore, terminating IBN PTS (FGA) trunk calls are not supplied with CPI information from originating agents.

IBN PTS MF (FGB) trunk terminations

PTS signaling does not transmit ANI spill information. Therefore, terminating IBN PTS (FGB) trunk calls are not supplied with CPI information from originating agents.

IBN PTS MF (FGD) trunk terminations

PTS signaling does not transmit ANI spill information. Therefore, terminating IBN PTS (FGD) trunk calls are not supplied with CPI information from originating agents. Instead, ATC trunks are used to deliver ANI spill information using the FGD protocol.

ATC PTS MF (FGD) trunk terminations

Originating screening indicators are ignored if suppression has been chosen for this tandem call arrangement on outgoing ATC PTS MF (FGD) trunk terminations that originate from NSS PTS trunks. This includes offnet originators with unlisted numbers.

IBN ISUP SS7 trunk terminations

If ANI information is not supplied by the originating trunk, IBN ISUP SS7 trunks do not assemble the parameters originating line information or calling party number in the IAM message. In addition, the charge number parameter is only provided for called party billable calls.

IBN ISDN PRA trunk terminations

Note: IBN ISDN PRA trunk SETUP messages do not provide a facility for saving ANI spill information digits.

For NSS PTS originating calls terminating on IBN ISDN PRA trunks and using OFFNET paths, whether the Called Number or Calling Number parameters, or both, are omitted from the SETUP message is controlled using Calling Number Delivery (CGNDELV) and Called Number Delivery (CDNDELV) in table LTDATA. The calling party number (CGN) and called party number (CDN) information elements in the SETUP message are optional per subscription.

AD2468**NSS ANI Delivery** (continued)

Three delivery options can be specified for the calling number delivery option in field CGNDELV of table LTDATA. The options are NEVER, ALWAYS and SCREENED. ALWAYS and NEVER are independent of the Calling Party Number parameter's presentation indicator. ALWAYS means that the Calling Party Number parameter is always delivered. NEVER means that the Calling Party Number parameter is never delivered. The third option, SCREENED, which is originator controlled, sends the Calling Party Number parameter but modifies the parameter based upon the presentation indicator. If the presentation indicator is anything except "Presentation_Allowed" and the delivery option is SCREENED, the Calling Party Number parameter is delivered, but with no ANI information provided. Otherwise, the parameter is delivered as usual.

Two delivery options can be specified for the called number delivery option in field CDNDELV of table LTDATA. The options are ALWAYS and NEVER. ALWAYS means that the Called Party Number parameter is always delivered. NEVER means that the Called Party Number parameter is never delivered.

If there is no entry in table LTDATA for the logical terminal ID (LTID), then the parameters Calling Party Number and Called Party Number are always included in the SETUP message. This is the normal method used for on-net configurations.

ATC ISUP SS7 trunk terminations

The delivery of parameters Originating Line Information and Calling Party Number is controlled by the field ANI datafill in table OCCINFO.

If table TRKGRP datafill for the ATC ISUP SS7 trunk indicates that fields ANI and INCCPN are Y, an additional check is made to determine if the number supplied in the Charge Number parameter is unique to the number supplied in the Calling Number parameter. If the numbers are the same, then the Charge Number parameter is omitted from the ISUP IAM message.

The delivery of the Transit Network Selector parameter is only provided for international calls.

The delivery of the Carrier Selection parameter is controlled by the field PICIND in table OCCINFO for the terminating ATC trunk.

ATC ISUP SS7 trunks require a 10-digit ANI using field BILLDN, if applicable, or in the special case of the physically received ANI over FGB, using offnet option, CONNGNPA.

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NSS ANI Delivery (continued)

DAT PTS trunk terminations

PTS signaling does not transmit ANI spill information. Therefore, terminating DAT PTS trunk calls are not supplied with CPI information from originating agents.

DAT ISDN PRA trunk terminations

For NSS PTS originating calls terminating on DAT ISDN PRA trunks and using OFFNET paths, whether the Called Number or Calling Number parameters, or both, are omitted from the SETUP message is controlled using Calling Number Delivery (CGNDELV) and Called Number Delivery (CDNDELV) in table LTDATA. The calling party number (CGN) and called party number (CDN) information elements in the SETUP message are optional by subscription.

Three delivery options can be specified for the calling number delivery option in field CGNDELV of table LTDATA. The options are NEVER, ALWAYS and SCREENED. ALWAYS and NEVER are independent of the Calling Party Number parameter's presentation indicator. ALWAYS means that the Calling Party Number parameter is always delivered. NEVER means that the Calling Party Number parameter is never delivered. The third option, SCREENED, which is originator controlled, sends the Calling Party Number parameter but modifies the parameter based upon the presentation indicator. If the presentation indicator is anything except "Presentation_Allowed" and the delivery option is SCREENED, the Calling Party Number parameter is delivered, but with no ANI information provided. Otherwise, the parameter is delivered as usual.

Two delivery options can be specified for the called number delivery option in field CDNDELV of table LTDATA. The options are ALWAYS and NEVER. ALWAYS means that the Called Party Number parameter is always delivered. NEVER means that the Called Party Number parameter is never delivered.

If there is no entry in table LTDATA for the logical terminal ID (LTID), then parameters Calling Party Number and Called Party Number are always included in the SETUP message. This is the normal method used for on-net configurations.

Interactions

The following paragraphs describe the interactions between NSS ANI Delivery and other functionalities.

AD2468**NSS ANI Delivery (continued)****MSN SMDR billing**

The field MSN_ANI_MAPPING is contained within the MSN extension record of the SMDR billing record. This field identifies whether or not ANI information provided to the terminating ISUP SS7 or ISDN PRA trunking agents is displayable for the purposes of supplying CLID information to further downstream terminating agents.

Call Forward/Call Transfer/Three-Way Call

Calls arriving from NSS PTS agents (including DAT, FGA, FGB or FGD trunk originators) that terminate to an IBN base station (including attendant consoles) and then are extended by the IBN base station using the Call Transfer/Call Forward/Three-Way Call feature to an additional destination, do not pass the original ANI to the terminator of the extended call. Instead, the display of the terminator of the extended call contains the ANI of the IBN base station. Also, if the IBN base station leaves the established Three-Way call, the display of the terminator of the extended leg of the call is not updated with the ANI of the originator of the call.

Reorigination feature

The reorigination feature allows the second leg of a call (using MONA) to be disconnected without having to regain access to the NSS when using cut-through dialing. Care is exercised to ensure that successive reoriginations receive the proper ANI information digits and ANI suppression information in the originating address of each reoriginated call. Note that calls delivering ANI by the conventional method of physically transmitting the ANI require SMDR billing to be activated in order to deliver ANI information on subsequent reoriginated calls. Although SMDR billing is not a requirement for the reorigination feature, failure to provide SMDR billing means that reoriginated calls will not have ANI delivered.

TRANslations VERification (TRAVER)

Translations for these various call scenarios can be verified by using the TRAVER command. Feature AD2470, NSS TRAVER Enhancements, contains complete details.

Datafill

Two new offnet options are added to table TRKGRP for trunk group types IBNTI and IBNT2 that enter a Y in field OFNTOPT. Specifically, offnet options CONNGNPA and ANIDELV are added for the offnet access trunk types, field OFNACTYP, of DAT, FGA, FGB and FGD.

Offnet option ANIDELV serves as an ANI suppression trunk group control as to whether or not calls incoming on DAT, FGA, FGB and FGD trunks allow or

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NSS ANI Delivery (end)

deny terminating agents (except ATC PTS MF (FGD) trunks) to display their ANI information. Omitting offnet option ANIDELV from field OFNTOPT suppresses the terminator's capability of using ANI information for display purposes. Conversely, supplying this option allows the terminator to use ANI information for display purposes.

Offnet option, CNNGNPA serves as a three-digit field that contains the numbering plan area (NPA) of the connecting switch adjoining the NSS PTS agent. For FBG agents, field CONNGNPA is used to pad the seven-digit ANI received by the FGB protocol with a three-digit NPA resulting in a complete 10-digit calling party number. This field is ignored for other NSS PTS offnet access types.

Service orders

NSS ANI Delivery does not affect SERVORD.

Operational measurements

NSS ANI Delivery does not affect operational measurements.

Logs

NSS ANI Delivery does not affect logs.

User interface

NSS ANI Delivery does not change the user interface.

Billing

NSS ANI Delivery does not affect billing.

AD2472
NSS-DBCP base

Functionality name

NSS-DBCP Base

Description

This feature provides the Network Services Software (NSS) the basic capability to route and tandem database query messages over Signaling System Number 7 (SS7) links. Examples of the queries include authorization code (Auth) validation, travel card number (TCN) validation, automatic number identification (ANI) validation, and 700, 800, 900 number (N00) translations. This feature also enhances table MSGRTE to provide global title translation capability and to format the calling address for messages routing over SS7 links.

Additionally, this feature provides a method by which DBCP related database modifications performed on a particular switch can be propagated across the network to other switches. Synchronization of multiple DBCP databases reduces datafill mismatch errors that may arise.

At the originating switch, when ANI validation from DBCP is required, the call processing assembles the ANI query message and invokes the ANI application. The ANI application looks at the called address of the message and determines whether the message should be routed to the ANI DBCP application via an SS7 link or to a local ANI DBCP application using table MSGRTE. The combination of routing indicators that can be used include global title (GT), point code (PC), and a subsystem number (SSN) routing.

Global Title routing indicates routing is based on the global title digits. Global title translations (GTT) is used to route the message in Loadsharing and Hot Stand-by to retrieve the destination point code (DBPC) and subsystem number. Loadsharing is the situation where there is more than one DBCP connected to the originating switch. The originating switch must decide which terminating switch should process the message. Hot Stand-by is the situation where one of the DBCP mates is corrupted then all messages are delivered to the other DBCP mate to be processed.

SSN routing indicates that routing should be done based on the PC and SSN. Although SSN routing is specified as the routing indicator, the calling and called addresses should always contain the global title digits. These digits paired with the netname "PUBLIC", are used to lookup table MSGRTE and determine how to route or return the message to the next switch.

AD2472

NSS-DBCP base (continued)

When an STP is present in the network, it provides the message tandem, Load Sharing and Hot-standby capabilities. It is recommended that when there is an STP involved, the routing indicator in the SCCP message should be set to GT routing so that the STP can perform GTT for the query messages. For the return messages, SSN routing is set as the routing indicator since the STP has the capability to tandem messages based on the PC and SSN.

The ANI SCCP subsystem is invoked when a message is to be routed via SS7 link. When a message arrives over a SS7 signaling link, it comes into the SCCP. The SCCP hands the message over to the appropriate subsystem for processing. Each NSS DBCP application is a separate SCCP subsystem which is capable of sending and receiving query messages. The NSS DBCP application subsystems will use Transaction Capabilities Application Part (TCAP), which are common protocol for sending messages across the SS7 network. The ANI SCCP subsystem calls the proper procedure to send the query message to the terminating switch.

At the terminating switch, the calling address becomes the called address and is used to send the return messages back to the originating switch. These addresses are datafilled on a per SCCP application subsystem basis. It is not determined at this time where the calling and called addresses are to be datafilled. The documentation for each of the specific DBCP application subsystems should contain this information.

When the NSS DBCP application subsystem goes down, it must send a subsystem prohibited to the SCCP to indicate that it is not capable to process any more messages. A procedure provided by the SCCP is called by the application to notify the SCCP that the subsystem is down. The SCCP broadcasts the SubSystem Prohibited (SSP) message to all the concerned destinations when a node or link goes down or an application system is busied from a map. The SSP message informs the SCCP management at the destinations of the failure of a subsystem. At this time, the SCCP routing tables are updated and the Subsystem-Status (SST) is initiated. SST is an audit procedure that detects whether the subsystem has been recovered in case an Subsystem Allowed (SSA) message is lost.

When the NSS DBCP application is up, another procedure provided by the SCCP is called by the application subsystem to notify the SCCP that the subsystem is now up and capable to process messages. The SSA message is sent to the concerned destinations when the subsystem is up or RTSed, or the node or link recovers. It informs the SCCP at the destinations that the subsystem which was formerly prohibited is now allowed and the routing tables updated.

AD2472**NSS-DBCP base** (continued)**Hardware requirements**

NSS-DBCP Base has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to NSS-DBCP Base:

- New selector GTT for table MSGRTE will only apply to NSS DBCP messages. A SWERR message will be generated if GTT selector is chosen by other subsystems.
- Primary Rate Access (PRA) D-channel is not supported by NSS DBCP.

Interactions

All features such as PRA facility and Interwork Subsystem using table MSGRTE will ignore the new GTT selector.

Datafill

Table MSGRTE is used by the PRA Facility process and the Interwork Subsystem to route messages through the network. Table MSGRTE is indexed by a three field key consisting of the Network Identifier (NETID), and two digit strings (FROMDIGS and TODIGS). Each entry can have up to four elements. Each element consists of one selector from (LOCAL, PRA, SS7). The list of selectors will be searched to find the first available channel or link to send the message out on. When a selector is local then only one element is allowed.

When a LOCAL selector is chosen, then the message terminates on this switch. When a SS7 selector is chosen, the SCCP Unit data message is constructed using the Point Code specified by the selector and sent to the associated SCCP application subsystem at the next switch. The DELDIGS and PREDIGS fields are parts of all these selectors. DELDIGS specifies the number of digits to delete from the beginning of the Destination Information Element before routing the message. PREDIGS is a string of digits to be prefixed to the destination information element before the message is routed.

A new selector, GTT, has been added to table MSGRTE to provide global title translation. Since Load Sharing and Hot Stand-by are requirements of NSS-DBCP configurations, it is necessary to do global title translation. When GTT selector is entered, there can only be one element for that entry. If selector GTT is chosen, then a global title name is retrieved from this tuple and stored in the SCCP address. The SCCP then does GTT to get an SS7 address consisting of PC and or SSN using table C7GTT, sets the routing indicator accordingly and routes the message to the next node. SSN routing is set as the

AD2472**NSS-DBCP base** (continued)

routing indicator when the entry in table C7GTT returns SSNONLY or PCSSN selector. GT routing is set as the routing indicator when the entry in table C7GTT returns PCONLY or PCNEWGT selector.

The following tables are datafilled in this feature:

- Table C7LOCSSN is used to datafill the local subsystem resident at the node. It provides attributes such as Subsystem name, Subsystem number (SSN), number of instances of the subsystem, indication of replication at another PC, Traffic Mix Information (TFMI) indicator and a list of concerned PCs which require notification on subsystem status changes.
- Table C7NETSSN is used to datafill the remote PCs and remote subsystems that are of concern to SCCP at the node. It provides attributes such as point code name and a list of subsystems at the PC where each subsystem consists of the subsystem name and number.
- Table C7RPLSSN is used to datafill a list of replicated subsystems that the node may route and keep status on. It provides attributes such as the subsystem name and a list of PC pairs where the subsystem is replicated.
- Table C7GTTYPE is used to datafill the types of GT translations supported by the node. It provides attributes such as the global title type name, global title type number, and global title internal name.
- Table C7GTT is used to datafill the GT translations performed by the node and their results. It provides attributes such as the GTT type name, FROM digits specifying the range of GT of that type and the result of the translation. The result specifies the result type, the results of the type and the cost. If two results are given then cost is used to pick the result. The lowest cost result is chosen unless both are equal then loadsharing is used. There are four different result types:
 - PCONLY, where one or two PC names are specified,
 - SSNONLY, where one local subsystem name is specified,
 - PCSSN, where one or two PCs or subsystems are specified, and
 - PCNEWGT, where one or two PCs with a new GT format are specified.

Service Orders

NSS-DBCP Base does not affect SERVORD.

Operational measurements

NSS-DBCP Base does not affect operational measurements.

AD2472
NSS-DBCP base (end)

Logs

NSS-DBCP Base does not affect logs.

User interface

NSS-DBCP Base does not change the user interface.

Billing

NSS-DBCP Base does not affect billing.

AD2491

Automatic Set Relocation Table Control

Functionality name

Automatic Set Relocation Table Control

Description

The Automatic Set Relocation (ASR) feature allows a user to move Integrated Voice and Data (IVD) telephone sets from one location to another without assistance from a service representative. Automatic Set Relocation Table Control is a component of the ASR feature and provides datafill when a user chooses to perform automatic set relocation.

Hardware requirements

Automatic Set Relocation Table Control requires upgraded 8X49 boards for proper operation. Firmware enhancements were made on the boards to accommodate the Automatic Set Relocation feature.

Limitations and restrictions

The following limitations and restrictions apply to Automatic Set Relocation Table Control:

- A message is displayed and table entry removed if the service representative attempts to remove an entry from the WRDN table that is needed to perform ASR "put set back IN service."
- Up to 160 ASR DNs may be added to table WRDN.
- Table ASR may have up to 160 tuples.
- The customer must set aside a group specifically for the use of the Automatic Set Relocation In (ASRI) process.
- The user receives the Feature Not Allowed (FNAL) treatment if he/she dials a DN that is set aside for ASR use.
- For additional limitations and restrictions of the ASR feature, refer to the section on feature AD2492, Automatic Set Relocation Feature Process.

Interactions

The following paragraphs describe the interactions between the ASR feature and other functionalities.

This feature requires features AD2492, Automatic Set Relocation Feature Process, and AD2493, Automatic Set Relocation XPM Interaction. The ASR feature will not operate if both of these features are not present.

AD2491**Automatic Set Relocation Table Control** (continued)

The ASR feature supports all options which are supported by Integrated Voice and Data sets and their associated data devices.

The ASR feature relies on the functionality of the SERVORD command, CKLN. The feature interactions supported by the CKLN command, CLEN and EBS, are supported by the ASR feature as well.

Datafill

Automatic Set Relocation Table Control updates three tables: ASR, IVDINV, and KSETLINE.

When a set is taken out of service using the ASR "OUT" code, the following table is updated:

- ASR

When a set is put back in service using the ASR "IN" code, the following tables are updated in the following order:

- IVDINV
- KSETLINE
- ASR

A set may be taken out of service using the ASR feature and put back in service at another len (by a service representative) using the CKLN service order. When a set is put back in service using the CKLN service order, the CKLN service order updates the ASR table. If a user takes a set out of service using the ASR out procedure, the set may be put back in service at the same len using the following procedure.

1. Enter table ASRTABLE.
2. Delete the entry for that DN (based on personal ID number).
3. Post set at LTP level of map.
4. RTS set.

Table ASR

Table ASR is a new table which contains records of digital sets that are in the process of being relocated. This table retains a user's six-digit personal identification number, along with information pertaining to which set is being relocated. Table ASR is updated to manage the bookkeeping of digital sets currently in ASR transition. Entries are added to this table when a set is taken out of service using the ASR feature. Entries are removed from this table when

AD2491**Automatic Set Relocation Table Control** (continued)

a set has been successfully relocated (by either the ASR feature or with the CKLN service order). An example of an entry in table ASR is:

CODE	PDN	OLD LEN	TEMP LEN
123456	5554922	04 0 00 08	04 0 00 08

- The CODE in the table is the user's six-digit personal identification. This code is created and entered by the person moving the set. The user must remember this code in order to put the relocated set back into service.
- PDN is the primary directory number of the set being relocated.
- OLD LEN is the line equipment number assigned to the set being relocated.
- TEMP LEN is a temporary line equipment number (this number is the same as the OLD LEN). This field provides future enhancement capability.

Note: If a user performs the ASR OUT function and receives a confirmation tone, then realizes he/she should not have performed ASR OUT, there is only one way to return that LEN to service. The user must contact the service representative and inform him/her of the mistake. To correct the mistake, the service representative will have to delete the entry corresponding to the personal ID code entered by the user from table ASR.

How to enable Automatic Set Relocation processing

A service representative must datafill the following tables to enable automatic set relocation processing. The tables must be datafilled in the following order:

1. IBNXLA
2. XLANAME
3. AUTHPART
4. AUTHCDE
5. WRDN

These tables can be datafilled in a variety of ways to provide ASR capabilities for a group. In the following sections, the datafill examples show only one of many ways to datafill translations for ASR "IN" and ASR "OUT."

AD2491**Automatic Set Relocation Table Control** (continued)**Table IBNXLA**

Table IBNXLA includes feature translators ASRI and Automatic Set Relocation Out (ASRO). These feature translators are given to customer groups requiring ASR.

Each customer group has its own entry in table IBNXLA for ASR "OUT." This requirement eliminates the potential problem of a customer group using an ASR access code that is already assigned to another feature for that group.

Sample Table IBNXLA

XLANAME	DGLIDX	TRSEL	ACR	SMDR	FEATURE
CUSTXLA	95	FEAT	N	N	ASRO

In this example, the entry defines an access code of 95 for the IBN translator CUSTXLA (ordinary customer group). ASR "take set OUT of service" processing is associated with the access code and customer translator. ASRO indicates the set is to be taken Out of service (ASR OUT).

Table IBNXLA is also used for ASR "put back IN service" (ASR IN), as shown below.

Sample Table IBNXLA

XLANAME	DGLIDX	TRSEL	ACR	SMDR	FEATURE
ASRXL	96	FEAT	N	N	ASRI

In this example, the entry defines an access code of 96 for IBN translator ASRXL (customer group ASR). ASRI indicates the set is to be relocated.

With this example datafill, ASR IN is limited to those lines which use the translator name ASRXL, which is datafilled in table CUSTHEAD. ASR OUT is limited to those lines which use the translator name CUSTXLA, which is also datafilled in table CUSTHEAD. Numbers 95 and 96, and names ASRXL and CUSTXLA are example names only. The fields ACR and SMDR were set to N for example purposes only.

The values for the fields TRSEL and FEATURE must be entered as shown in the example for the feature to be accessible.

AD2491**Automatic Set Relocation Table Control** (continued)**Table XLANAME**

Table XLANAME is used for a specific translator name. XLANAME is indexed into table IBNXLA with the translator name in field XLANAME (see the example above in Table IBNXLA).

Sample Table XLANAME

XLANAME	TRSEL	ACR	SMDR	FEATURE
CUSTXLA	\$	N	N	ASRO
ASRXLA	\$	N	N	ASRI

Table WRDN

Table WRDN is used to add specific DNs that require ASR. Up to 160 ASR DNs can be added to this table. Table WRDN is datafilled to accommodate the case when 160 sets are put out of service by ASR and requires an equal number of DNs to be put back into service. Call processing uses table WRDN.

The format of table WRDN is as follows:

DN_KEYDIRECTORY_NUMBER_RESULT

805 555 2191ASR

In this example, DIRECTORY_NUMBER_RESULT is a new feature named ASR. This feature identifies the DN to be used only for ASR purposes.

Table AUTHPART

Table AUTHPART defines the partition in the authorization code database in which to store the authorization codes for a customer group. The authorization code is fixed in length on a customer group basis. The length of the authorization code is two to 10 digits long. The following examples use five digits in the authorization code.

The format of table AUTHPART is as follows:

PARTNMFORMATLENGTHSIZE

BNRP1BN520

AD2491**Automatic Set Relocation Table Control** (continued)

- PARTNM (partition name) is the customer group defined in table CUSTHEAD.
- FORMAT is always IBN when an authorization code is assigned to a customer group.
- LENGTH is the number of digits in each authorization code within the partition.
- MAXSIZE is the maximum allowable number of authorization codes that can be accommodated in the partition.

Table AUTHCDE

Up to 20 authorization codes are made available for use by this feature for each customer group. Table AUTHCDE is updated to include these authorization codes. The type of authorization codes utilized by ASR is the Switch Wide Code type.

The format of table AUTHCDE is as follows:

Sample Table AUTHCDE

AUTHPART	AUTHCODE	FMT	NCOS	ACCT	SECDIGS	TYPE
BNRP	123456	IBN	0	N	2222	ASR
BNRP	654321	IBN	0	N	1234	ASR
BNRP	123467	IBN	0	N	4444	ASR

- AUTHPART is the partition name in table AUTHPART.
- AUTHCODE is the authorization code field.
- FMT is the format field (either IBN or EXEMPT).
- NCOS is the network class of service for the feature.
- ACCT allows a combined authorization and accounts code for a specific authcode.
- SECDIGS calls for the user to dial security digits after the specific authorization code.
- TYPE indicates Switch Wide (SW) authorization code type.

AD2491**Automatic Set Relocation Table Control** (continued)

Tables KSETLINE, KSETFEAT, IVDINV, and IBNSC

A check is made to determine if the len to be changed or deleted is in table ASRTABLE. No lens can be changed or deleted if in table ASRTABLE.

Service orders

The ASR feature supports a new service order command, Query Autoset Relocation (ASRSHOW). There are two syntax statements for the ASRSHOW command.

Command:

ASRSHOW DN <PDN>

Response:

DN ID OLD LEN TEMP LEN

<PDN><6_Digit_ID_Code><Old_LEN><Temp_LEN>

Where:

- PDN is the Primary Directory Number of the set being moved. This must be supplied by the service representative.
- 6_Digit_ID_Code is the user's personal ID code.
- Old_LEN is the LEN of the set being moved.
- Temp_LEN is identical to Old_LEN.

Command:

ASRSHOW ALL <SUM or DETAIL>

Response:

DN ID OLD LEN TEMP LEN

If the Summary option is chosen, then only a sum of the DNs in the ASR "OUT" state is displayed.

The service representative may relocate a digital set's datafill by performing the CKLN service order command. CKLN updates the ASR table to ensure the set is recorded as relocated.

AD2491

Automatic Set Relocation Table Control (end)

Operational measurements

Automatic Set Relocation Table Control does not affect operational measurements.

Logs

Automatic Set Relocation Table Control does not affect logs.

User interface

Automatic Set Relocation Table Control does not change the user interface.

Billing

Automatic Set Relocation Table Control does not affect billing.

AD2492

Automatic Set Relocation Feature Process

Functionality name

Automatic Set Relocation Feature Process

Description

The Automatic Set Relocation (ASR) feature allows a user to move Integrated Voice and Data (IVD) telephone sets from one location to another without assistance from a service representative. Automatic Set Relocation Feature Process describes the steps required to operate the ASR feature.

Preliminary setup required for ASR

Several steps must be completed before starting the ASR feature process. Performing these steps ensures proper operation of ASR.

1. Add feature translators ASRI and ASRO to tables IBNXLA and XLANAME.
2. Define authorization codes in tables AUTHCODE and AUTHPART.
3. Create temporary datafill to allow the user to receive dial tone and to dial the ASR IN code. This is accomplished by the system having a directory number set aside for ASR as well as having a customer group set aside for ASR IN use. Perform the following steps:
 - a. Set aside one DN for ASR use. One DN must be set aside for each set that is to be relocated at the same time as other sets are being relocated. Up to 160 sets may be relocated at one time, therefore, set up to 160 DNs for ASR use.
 - b. Create a special customer group to be used for ASR IN use. This customer group is entered in the system as any other customer group. However, this special customer group must also be identified in table OFCVAR for the entry ASR_CUSTGRP. ASR OUT or ASR IN will not work on sets if there is no customer group identified for ASR_CUSTGRP.

Note: It is recommended that this customer group be set up so that the user may only dial the ASR IN code. By limiting the customer group to ASR IN only, this eliminates the possibility of users using

AD2492**Automatic Set Relocation Feature Process** (continued)

the maximum number of sets that are allowed to be in the ASR OUT state at one time.

- c. The customer group identified in ASR_CUSTGRP will be used for the temporary KSETLINE table entry, along with a SUBGRP of 0 and an NCOS of 0.
4. Make sure each group that will be using the ASR feature has an entry in table CUSTHEAD identifying the ASR feature translator.

Note: Refer to feature description AD2491, Automatic Set Relocation Table Control, for specific datafill information on the tables referenced in the previous steps.

Operating the ASR feature

Complete the steps in tables ASR OUT and ASR IN to operate the ASR feature. The table includes system responses to each action.

ASR OUT

Action	System Response
1. Go offhook at the PDN on the set.	- Dial tone.
2. Dial ASR OUT code (datafilled in table IBNXLA). (Dialing ASR OUT on the secondary DN receives treatment.)	- Special dial tone.
3. Dial ASR authorization code.	- Special dial tone if successful. Dial tone for first invalid authorization code and treatment for the second invalid authorization code.
4. Dial personal authorization code.	- Special dial tone if successful. Dial tone for first invalid authorization code and treatment for the second invalid authorization code.
5. Dial a six-digit ID code. (Remember this code as it will be used again.)	- Dial tone for duplicate ID code. Confirmation tone if successful. After giving confirmation tone, the system disconnects the call. Then the LEN associated with the set and the LEN of the associated data device are taken out of service by setting the line states to Installation Busy (INB).
6. Unplug the set.	- No response.
7. Take the set to its new location.	- No response.

AD2492**Automatic Set Relocation Feature Process** (continued)**ASR IN**

Action	System Response
1. Plug the set into any properly equipped jack. See Warning below.	- System recognizes the set has been plugged in. System datafills new LEN with temporary datafill.
2. Wait 30 seconds before taking the next step.	- No response.
3. Lift the handset of the telephone set.	- Stuttered dial tone.
4. Dial ASR IN code (datafilled in table IBNXLA).	- Special dial tone.
5. Dial a six-digit ID code. (The same one used in step 5 in ASR OUT table.)	- Confirmation tone if successful. Dial tone for first invalid personal ID code and treatment for the second invalid personal ID code.
6. Wait one minute before attempting to use the telephone set or the corresponding data device.	- System is moving the datafill for the telephone during this time.

**DANGER****Digital set or line card damage**

If an IVD digital set is plugged into a jack equipped with a non-IVD line card, damage to the digital set and/or line card may occur.

Note: If no dial tone is received in step 3 in the ASR IN table, release the call and go offhook again. If there is still no dial tone, contact the system administrator.

If a user forgets what number was dialed in step 5 in the ASR OUT table, a service representative can use a new query command, based on the PDN of the set, to find the ID number dialed by the user. This new command, ASRSHOW, is described in feature AD2491, Automatic Set Relocation Table Control.

In steps 3 and 5 in the ASR OUT table, the user is given two chances to enter a valid authorization code. If an invalid authorization code is entered on the first attempt, normal dial tone is returned. The user can try to enter a correct authorization code. If another invalid code is entered, a treatment is returned.

AD2492**Automatic Set Relocation Feature Process** (continued)

If the user enters an invalid personal ID code in step 5 in the ASR OUT table, normal dial tone is returned. If the user enters a PID that is already being used by someone else, normal dial tone is returned. There is no limit to the number of times the user may try to store a valid PID code.

If the user enters an invalid PID code in step 5 in the ASR IN table, normal dial tone is returned. The user can retry the PID code. If another invalid PID code is entered, treatment is returned. This eliminates guessing the code and prevents security problems.

The user can use the '*' key to restart code entering if a mistake was made while entering codes (authorization and PID) in the above-mentioned steps. If a treatment has already been given for the error, the '*' key will not work. If the user misdials and treatment is received, the user must hang up before trying the ASR process again.

If the user presses a feature key, such as call pickup, during the ASR process, one of two things occurs:

- If the user enters digits while pressing the feature key, the key depression is ignored. The user may continue entering digits, as if the feature key was never pressed.
- If the user receives dial tone or special dial tone while pressing the feature key, three seconds of reorder signaling is given indicating that the new feature may not be started. The user is then given dial tone to signal that the ASR process is ready to accept digits for the step in which the feature key was pressed.

Some features are exceptions to the above limitation. If the user presses any of the following feature keys during the ASR process, the feature will be activated/deactivated (based on the previous state of the feature):

- Make Set Busy (MSB)
- Night Service (NGTSRVCE)
- Controlled Interflow (CIF)

Hardware requirements

Automatic Set Relocation Feature Process requires upgraded 8X49 boards in order to work properly. The firmware was enhanced on these boards to accommodate ASR.

AD2492

Automatic Set Relocation Feature Process (continued)

Limitations and restrictions

The following limitations and restrictions apply to Automatic Set Relocation Feature Process:

- Only plug an IVD digital set into a jack that is equipped with an IVD line card (8X47BA).



DANGER

Digital set or line card damage

If an IVD digital set is plugged into a jack equipped with a non-IVD line card, damage to the digital set and/or line card may occur.

- Relocation procedures must be originated from the primary directory number on the telephone set.
- Only 160 sets may be in the ASR "OUT" state at one time. The number of DNs allocated for this feature's use will determine the actual number of sets that can be in the ASR OUT state at the same time. At least one DN must be set aside for ASR use.
- A log is generated if a user attempts to perform the ASR OUT function when no DNs have been set aside for ASR use.
- The new location must be equipped and datafilled with the appropriate card type (8X47BA) in table LNINV.
- ASR on MADNs must comply with MADN distribution and engineering restrictions. All MADN engineering rules are checked. If the MADN rules are violated by moving a set to its new location, a log is generated.
- Data options (MADO and MPDA) are automatically relocated when the host set is relocated using the ASR feature.
- ASR only applies to IVD digital terminals and related data options. The IVD terminals and options supported by ASR are M2009, M2112, M2018, M2317, MADO; M3000; M2008, M2616, M2016S, M2216A, M2216B, MPDA.
- The ASR OUT and ASR IN functions are not allowed during an image function. Once the image is complete, these functions are allowed. If attempted during the image process, the user will be routed to treatment. If a user plugs a set into an empty LEN during an image, the plug-in is not

AD2492**Automatic Set Relocation Feature Process** (continued)

processed, no temporary datafill is made, no dial tone is heard and no action is taken to allow the user to bring the set back into service.

- The displays associated with the sets are not used for ASR processing instructions.
- The customer group datafill for ASR IN must be datafilled to only allow the user to enter the ASR IN code.
- A log is generated when the maximum number of sets have performed ASR OUT at one time. The log entry indicates that no more sets may perform the ASR OUT function until the ASR IN function is performed.
- A log is generated if the ASR IN procedure fails.
- If a user performs the ASR OUT function and receives confirmation tone, then realizes he/she should have not performed ASR OUT, there is only one way to return the LEN to service. The user must contact the service representative and inform him/her of the mistake. To correct the mistake, the service representative will have to delete the entry corresponding to the personal ID code entered by the user. Once this entry is deleted, the service representative must go to the LTP level of the MAP and return the user's line to service. Refer to feature AD2491, Automatic Set Relocation Table Control, for information on ASRTABLE.
- A service representative cannot change the state of a LEN when set to INB (during an ASR OUT procedure). The state can be changed after the corresponding entry in table ASRTABLE is deleted.
- No feature interactions are supported during the ASR process. If a user attempts to activate a feature during the ASR process, one of two things occurs:
 - If the user enters digits while pressing the feature key, the key depression is ignored. The user may continue entering digits, as if the feature key was never pressed.
 - If the user receives dial tone or special dial tone while pressing the feature key, three seconds of reorder signaling is given indicating that the new feature may not be started. The user is then given dial tone to signal that the ASR process is ready to accept digits for the step in which the feature key was pressed.

AD2492**Automatic Set Relocation Feature Process** (continued)

Some features are exceptions to the above limitation. If the user presses any of the following feature keys during the ASR process, the feature will be activated/deactivated (based on the previous state of the feature):

- Make Set Busy (MSB)
- Night Service (NGTSRVCE)
- Controlled Interflow (CIF)
- No calls may be active or on hold at any DN on the set during the ASR OUT process.
- The user must wait 30 seconds after plugging the set into its new location before going offhook at the PDN of the set. After 30 seconds, the user can dial the ASR IN code. If no dial tone is received at this point, unjack the set. Wait 20 seconds, then follow the steps outlined in the table ASR IN beginning at step 1. If there is still no dial tone after this, contact the system administrator.
- The following options and features are supported by the ASR process. If a set has an option or feature that is not listed in the following table, then the datafill for that set may not be moved from one LEN to another using the ASR process.

Features Supported by ASR (Sheet 1 of 3)

Feature Acronym	Feature Name
AUL	Automatic Line
SPB	Special Billing
DIN	Denied Incoming
PBL	Private Business Line
CLI	Calling Line Identification
DND	Do Not Disturb
RMB	Random Make Busy
RSUS	Requested Suspension
SHU	Stop Hunt
SEC	Security Code
CUG	Datapath Closed User Group

AD2492**Automatic Set Relocation Feature Process** (continued)**Features Supported by ASR (Sheet 2 of 3)**

Feature Acronym	Feature Name
TWC	3-Way Calling
RAG	Ring Again
AUD	Auto Dial
CNF	6-Port Conferencing
CPU	Call Pick Up
SCL	Speed Calling Long
SCS	Speed Calling Short
CPK	Station Call Park
DCPK	Directed Call Park
CXR	Line Call Transfer Option
PRL	Privacy Release
CFU	Call Forward Universal
MSB	Make Set Busy All
MCH	Malicious Call Hold
SNR	Store Number Redial
EBO	Exec Busy Override Originate
GIC	Group Intercom for IBN Lines
QTD	Query Time and Date
AAB	Auto Answerback
NRS	Network Resource Selector
INSPECT	Inspect Key
KSH	Key-Set Short Hunt
QBS	Query Busy Station
PRV	MADN SBA/MBA Privacy Option

AD2492**Automatic Set Relocation Feature Process** (continued)

Features Supported by ASR (Sheet 3 of 3)

Feature Acronym	Feature Name
LOB	Line of Business
ACDNR	Automatic Call Distribution Not Ready
OBS	Observe Agent
EMK	ACD Emergency Key
ASL	Agent Status Lamp
SUPR	Supervisor
DQS	Display Queue Status
NGTSRVCE	ACD Night Service Key
DQT	Display Queue Threshold
CFI	Call Forward Intragroup
CFB	Call Forward Busy
CFD	Call Forward Don't Answer
SOR	Station Origination Restrictions
CCW	Cancel Call Waiting
CIF	Control Interflow
TBO	Terminating Billing Option
CPR	Call Path Restoration
SDY	AT&T Line Study
MWT	Message Waiting
CWT	Call Waiting
SIC	Single Intercom

- User receives treatment of FNAL if a DN that is set aside for ASR use is dialed.

AD2492**Automatic Set Relocation Feature Process** (continued)

- User receives treatment of FNAL when he/she dials into the switch through DISA (Direct Inward System Access) then attempts to perform ASR OUT or ASR IN function.
- ASR process cannot be performed on a phone line that is set up as AUL (automatic line).
- Entries for a LEN may not be changed when the LEN is in the ASR OUT state, with the following exceptions:

- HUNTGRP

- MDNGRP

The entries for these two tables may be changed since the entry represents information for a group, not an individual LEN.

- CFX

An entry for a LEN in the ASR OUT state can be changed in table CFX. This lets the user change the forwarding information for the set while it is in the OUT state.

Interactions

The following paragraphs describe the interactions between Automatic Set Relocation Feature Process and other functionalities.

This feature operates only when used in conjunction with features AD2491, Automatic Set Relocation Table Control, and AD2493, Automatic Set Relocation XPM Interaction.

The Automatic Set Relocation feature supports all options supported by IVD sets and their associated data devices, with no restrictions.

ASR relies on the functionality of the SERVORD command, CKLN. The CKLN command allows the service representative to move the datafill for any key set from one LEN to another. The feature interactions supported by the CKLN command are supported by the ASR feature. The ASR feature allows the user to relocate IVD sets without the steps required in the CKLN command. ASR is an automated operation, freeing the service representative from the task of moving each set requiring relocation.

Datafill

Automatic Set Relocation Feature Process does not affect data schema tables or office parameters.

AD2492

Automatic Set Relocation Feature Process (continued)

Service orders

Automatic Set Relocation Feature Process does not affect SERVORD.

Operational measurements

Operational measurements (OM) keeps track of the number of sets moved by the Automatic Set Relocation Feature Process.

Logs

Automatic Set Relocation Feature Process generates the following new logs.

- A log is generated each time a set is taken out of service. The log entry contains the user's LEN currently being accessed, the PDN (Primary Directory Number), the personal authorization code and the personal ID code.
- A log is generated each time a set is put back into service. The log entry contains the PDN and new LEN location.
- A log is generated when the MADN rules are violated by the moving of the set. ASR on MADNs must comply with MADN distribution and engineering restrictions. When a user is bringing a set back into the system and this set has a MADN appearance, the MADN engineering rules are checked. The log entry indicates the reason for the failure.
- A log is generated when the maximum number of sets have entered the ASR OUT state. The log entry indicates that no more sets may perform the ASR OUT function until some sets perform the ASR IN function.
- A log is generated when a user attempts to perform the ASR OUT function when no more DNs are available for ASR use.
- A log is generated when the user attempts to perform the ASR OUT function and no customer group has been identified for ASR IN table OFCVAR.
- A log is generated when the user attempts to perform ASR OUT or ASR IN during the dumping of an image.
- A log is generated if the user is performing any of the ASR IN processes listed below:
 - A log is generated and the ASR IN process fails if the LEN of the OLD location is not idle (IDL), machine busy (MB) or offline (INB).
 - NEW LEN has a "Reserved" status.
 - NEW LEN has a "Restricted" status.
 - PDN is deleted from the LEN of the OLD location.

AD2492**Automatic Set Relocation Feature Process** (continued)

- OLD LEN has Subscriber Line Usage (SLU) option.
- OLD LEN has an option not supported by the ASR process.
- OLD LEN is located on an MTS node and the NEW LEN is not.
- OLD LEN cannot be deleted from table LINESTAT.
- NEW LEN cannot be added to table CKLN.
- The ASR IN process will continue even if the MADN engineering rules cannot be checked. The log entry indicates that the engineering rules could not be checked.
- If the ASR IN process fails due to any condition, the log entry indicates on which LEN the ASR IN process failed.
- If the personal ID code and the associated data cannot be deleted from table ASRTABLE.
- A log is generated if the temporary entry (created for the purpose of allowing the user to perform the ASR IN process) cannot be removed from table IVDINV.
- A log is generated if the ASR process cannot unprotect data store for the purpose of modifying it.
- A log is generated if one of the following conditions occur when the user is unplugging the IVD set:
 - User plugs set into a LEN that is not datafilled up through table LNINV.
 - ASR plug in process fails to return the temporary LEN to service. The service representative will have to return the LEN to service.
 - User plugs set into a LEN that has a mate data line datafilled in table IVDTRBL. This log entry indicates that the data port on that LEN has been previously diagnosed as being a bad port. The service representative may delete the entry from table IVDTRBL, allowing the user to retry the plug-in. However, if the user has a data device associated with the IVD set, this device will not function properly at the new location once the user has performed the ASR IN process. (This is because of the bad port for the data device. It is recommended that a new LEN assignment be given to new location.)
 - User plugs into a LEN that already has a mate data line datafilled in table IVDINV. The service representative should investigate why the mate LEN is datafilled. If it is safe to delete the datafill for the mate

AD2492

Automatic Set Relocation Feature Process (end)

LEN, then the user may retry the plug-in after the service representative has removed the datafill for the mate LEN.

- User plugs in set into LEN during the dumping of an image.
- A log is generated if one of the following conditions occur when the user is performing the ASR OUT process:
 - User performs process from a LEN that is already in the ASR OUT state.
 - Personal ID code and other information cannot be added to table ASRTABLE.

User interface

Automatic Set Relocation Feature Process does not change the user interface.

Billing

Automatic Set Relocation Feature Process does not affect billing.

AD2493**Automatic Set Relocation XPM Interaction****Functionality name**

Automatic Set Relocation XPM Interaction

Description

The Automatic Set Relocation (ASR) feature allows a user to move Integrated Voice and Data (IVD) telephone sets from one location to another without assistance from a service representative. Automatic Set Relocation XPM Interaction implements the XPM (LGC/LTC/RCC) software changes required to handle the jack/unjack messages from the DLM.

Hardware requirements

The Automatic Set Relocation XPM Interaction feature requires the following equipment.

- The user's new location must be equipped with the appropriate line card type (8X48BA) and jack. When a user plugs a set into a jack that is not equipped with an appropriate line card, no dial tone is sent to the set.
- Upgraded 8X49 boards. These boards have firmware enhancements to accommodate the ASR feature.

**DANGER****Digital set or line card damage**

If an IVD digital set is plugged into a jack equipped with a non-IVD line card, damage to the digital set and/or line card may occur.

AD2493

Automatic Set Relocation XPM Interaction (continued)

Limitations and restrictions

The following limitations and restrictions apply to Automatic Set Relocation XPM Interaction:

- The number of sets that can be relocated simultaneously is 160.
- There must be some unassigned DNs allocated for use by ASR. These DNs cannot be used by any other feature.
- ASR supports the following digital sets:
 - M2009
 - M2112
 - M2018
 - M2317
 - M2008
 - M2616
 - M2216A
 - M2216B
 - M3000
 - MADO
 - ADATA1

Interactions

The following paragraphs describe the interactions between Automatic Set Relocation XPM Interaction and other functionalities.

The ASR feature does not change the attributes of a set, it only moves the datafill of the set from one location to another. A set which has been moved from location to another functions as it did before the move.

This feature operates only when used in conjunction with features AD2491, Automatic Set Relocation Table Control, and AD2492, Automatic Set Relocation Feature Process.

Datafill

Automatic Set Relocation XPM Interaction does not affect data schema tables or office parameters.

AD2493

Automatic Set Relocation XPM Interaction (end)

Service orders

Automatic Set Relocation XPM Interaction does not affect SERVORD.

Operational measurements

Automatic Set Relocation XPM Interaction does not affect operational measurements.

Logs

Automatic Set Relocation XPM Interaction does not affect logs.

User interface

Automatic Set Relocation XPM Interaction does not change the user interface.

Billing

Automatic Set Relocation XPM Interaction does not affect billing.

AD2854

NSS Validated Account Codes and Authcode Last Dialing Plan

Functionality name

NSS Validated Account Codes and Authcode Last Dialing Plan

Description

This feature validates the content of two- and three-digit account codes for calls originated over network services software (NSS) Feature Group A (FGA), Feature Group B (FGB), network services software Feature Group D (NSSFGD) and integrated business network (IBN) trunks and direct access trunks (DAT).

This feature also provides an authcode last dialing plan within Meridian offnet access (MONA) which is accessed from FGA, FGB, NSSFGD, IBN trunks and DATs.

In addition to validating account codes and the authcode last dial plan, this feature provides two additional capabilities.

- This feature changes the reset interaction so that when the reset key (*) is pressed, the call stage is moved to the last audible prompt tone (to the last prompt tone that is not N for no dial tone). This capability is only applicable when the dial plan is authcode first and the destination prompt is N for no dial tone, or when the dial plan is authcode last and the account code prompt is N.
- The interactions for reset dialing for the authcode first dial plan when secrecy is on are also changed in this feature. This feature changes the interactions so that if the reset key (*) is pressed during collection of the authcode, pin digits, security code digits, combined authcode/account code, and account code digits, the call stage will be set to the authcode prompt tone so that the dialing sequence may be redialed.

Hardware requirements

NSS Validated Account Codes and Authcode Last Dialing Plan has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to NSS Validated Account Codes and Authcode Last Dialing Plan:

- Account code validation is only performed on NSS FGA, FGB, NSSFGD, and IBN trunks and NSS DATs.
- Only two- and three-digit account codes may be validated.

AD2854**NSS Validated Account Codes and Authcode Last Dialing Plan**

- Zero may not be dialed as the first digit of the destination digits under authcode last dial plan when both authcode last and travel card dialing are permitted on the same trunk group.
- The destination digits are ignored and the call is routed to the hotline number if a hotline number is associated with the authcode dialed using the authcode last dial plan.
- The Authcode or Account Code Required (ACR) option in table CUSTHEAD specifying authcode required has no effect on the authcode last dial plan. This does not prevent a destination only dial plan from using the ACR option to specify that an authcode should be collected.
- Reset dialing cannot be performed during the collection of the account code if a caller dials a private speed call number that is datafilled in table PSCNUM under the private speed call index associated with the authcode that was dialed, and if the account code prompt is N for no dial tone. This restriction applies under the authcode last dial plan.
- An account code is not collected for authcode hotline calls under the authcode last dial plan, unless table CUSTHEAD specifies combined authcode/account codes.
- A call resets back to the authcode collection state if the account code prompt is N for no dial tone and if the reset key (*) is pressed during the collection of the account code. The destination digits are translated based on the customer group and NCOS associated with the last authcode that was dialed. If the destination digits do not translate, the appropriate logs are generated and the call is sent to treatment. Even if the call completes, logs may still be generated.

Interactions

The following paragraphs describe the interactions between NSS Validated Account Codes and Authcode Last Dialing Plan and other functionalities.

Validated account codes**Reorigination**

The account code is validated if it is required on a reoriginated call and if the customer group used in translating that call specifies that account code's validation.

Account code length

The length of the dialed account code may be greater than or equal to the account code length specified in the ACCT option in table CUSTHEAD for a particular customer group. If the account code length is less than the length

AD2854

NSS Validated Account Codes and Authcode Last Dialing Plan

specified in table CUSTHEAD, then a log is output and the call is routed to treatment regardless of whether account code validation is required.

The exception is when the account code is collected with the authcode under the combined authcode/account code specified in table CUSTHEAD. In this case, the account code length must be the same as the length specified in the ACCT option. If it is not, a log is output and the call is routed to treatment regardless of whether account code validation is required.

If the account code length is greater than or equal to the account code length specified in table CUSTHEAD and account code validation is required, only the number of digits specified in table CUSTHEAD are validated. These digits are taken from the beginning of the account code digit stream. For example, the call will not complete if the following happens:

1. Table CUSTHEAD specifies that the account code length for customer group of the caller is three.
2. 12345 is dialed as the account code.
3. 123 is datafilled in table ACSCRN1 for the account code screening index associated with the customer group of the caller.

FGD pure dialing

Account codes are also validated for pure FGD calls in the manner specified in this document.

Authcode last dial plan

Reset dialing

Reset dialing may be used under the authcode last dial plan during the collection of destination digits, authcode, or account code. If the reset dialing feature is used, the call resets to the previous dial tone.

Reorigination

Reorigination may be performed for calls using the authcode last dial plan.

PIN

Personal identification number (PIN) interactions and digits are collected with an authcode under this dial plan in the same manner they are collected under the authcode first dial plan.

Account code

Account codes may be required based on authcode or IBN translations.

AD2854**NSS Validated Account Codes and Authcode Last Dialing Plan****Security digits**

Security digits are collected with an authcode under the authcode last dial plan in the same manner they are collected under the authcode first dial plan.

Secrecy

The Secrecy feature proceeds from the collection of a valid authcode and optional security code to the next stage of the call without waiting for an pound sign (#) or inter-digit timeout. Under the authcode first dial plan, prompt tone for destination digits is immediately applied when the Secrecy feature is active. Under the authcode last dial plan, if an account code prompt tone is required, then it will immediately be given if the Secrecy feature is active.

Private Speed Calling

Private Speed Call Number may be dialed with the authcode last dial plan.

Authcode Hotline

If an authorization code that has a hotline associated with it is dialed, the destination digits that were dialed will be ignored and the call will be routed to the hotline number associated with the authcode.

Conditional Hotline

The call will route to the conditional hotline route if the dial plan has the Conditional Hotline feature, and if digit collection times out during the collection of the authcode or collection of the destination digits.

FGD Pure Dialing

The authcode last dial plan is valid for FGD pure calls when access is obtained by the MONA listed directory number.

Datafill

NSS Validated Account Codes and Authcode Last Dialing Plan affects data schema tables as follows.

Table ACSCRN1

This table is the account code screening table and is created by the NSS Validated Account Codes and Authcode Last Dialing Plan features. The table contains a list of valid two- or three-digit account codes for each index.

The two-part key to this table consists of an index (ACSCRIDX) and a valid account code (ACCTCODE). No other information is stored in a tuple. Adding several tuples with the same account code screening index, but different account codes, forms the list of account codes that are valid for the customer group associated with that account code screening index.

AD2854**NSS Validated Account Codes and Authcode Last Dialing Plan**

The range of ACSCRIDX is one to 2047. A given ACSCRIDX may contain either two-digit account codes or three-digit account codes, but not both. If the ACSCRIDX contains two-digit account codes, then up to 100 account codes may be datafilled for that ACSCRIDX. If the ACSCRIDX contains three-digit account codes, up to 1000 account codes may be datafilled.

The first account code that is datafilled for a particular ACSCRIDX determines the length of all other account codes that can be datafilled for that ACSCRIDX. For example, if the first account code that is datafilled for ACSCRIDX 5 is 23, then all other account codes datafilled with ACSCRIDX 5 must be two digits. Data entry personnel should insure that the account codes datafilled in table ACSCRN1 for a given customer group are the same length as specified in the ACCT option of table CUSTHEAD for that customer group. If they are different, then the calls are routed to treatment.

Since the only information that each entry contains is the key, a CHANGE operation is not valid. To change a tuple, it must be deleted and re-entered.

Table CUSTHEAD

A new selector, ACCTVAL, is added to the ACCT option in table CUSTHEAD. This selector specifies, on a customer group basis, whether or not account code validation is performed. If account codes are to be validated, ACCTVAL is datafilled Y, otherwise, it should be datafilled N. For calls that require account code screening, ACCTVAL is datafilled Y for the customer group that is used to translate those calls.

The DIGINACC field of the ACCT option specifies the account code length for a customer group. Since only two- or three-digit account codes may be validated, either two or three must be datafilled in the DIGINACC field. If DIGINACC is datafilled with a number other than two or three, then ACCTVAL must be datafilled to N.

When ACCTVAL is datafilled Y, an account code screening index, ACSCRIDX, must be datafilled. ACSCRIDX is used to index into the account code screening database using table ACSCRN1.

Table DIALPLAN

Specifying the authcode last dial plan involves datafilling two tables: TRKGRP and DIALPLAN. A dial plan name is specified in table TRKGRP under the field DIALPLAN. This dial plan name must be datafilled in table DIALPLAN with PLAN TYPE = CUTTHRU and CTTYPER = AUTHONLY. When PLAN TYPE = CUTTHRU and CTTYPER = AUTHONLY, the next field to be datafilled is ORDER. This feature adds LAST as a valid entry for the

AD2854**NSS Validated Account Codes and Authcode Last Dialing Plan (end)**

ORDER field. When LAST is entered in the ORDER field, data entry personnel are prompted for the destination, authcode, and account code prompt tones.

Under the NSS Offnet Access Dialing Plan Driver, feature AD2471, a CTTYPER of AUTHORTC could be datafilled when the PLAN TYPE was CUTTHRU. AUTHORTC allows both authcode and travel card dialing on the same trunk group. Feature AD2854 allows the authcode dial plan under AUTHORTC to refer to either the authcode first or authcode last dial plans.

When a CTTYPER of AUTHORTC is datafilled, data entry personnel are prompted for AUTHNAME and TCNNAME. The AUTHNAME subfield must be datafilled with a dial plan name that uses the AUTHONLY dial plan. If the ORDER for this AUTHONLY dial plan is FIRST, then AUTHORTC refers to authcode first or TCN dial plan. If the ORDER for this AUTHONLY dial plan is LAST, then AUTHORTC refers to authcode last or TCN dial plan.

Service orders

NSS Validated Account Codes and Authcode Last Dialing Plan does not affect SERVORD.

Operational measurements

NSS Validated Account Codes and Authcode Last Dialing Plan does not affect operational measurements.

Logs

NSS Validated Account Codes and Authcode Last Dialing Plan has added two new reports to the existing IBN 110 log.

- INCONSISTENT ACCT LENGTHS
- ACCT VALIDATION FAILURE

User interface

NSS Validated Account Codes and Authcode Last Dialing Plan does not change the user interface.

Billing

NSS Validated Account Codes and Authcode Last Dialing Plan does not affect billing.

AD2856

NSS-DBCP travel card number validation

Functionality name

NSS-DBCP travel card number validation

Description

This feature provides the Network Services Software (NSS) the basic capability to route and tandem database query messages over Signaling System Number 7 (SS7) links. More specifically, this feature allows the customer to remotely validate travel card numbers (TCN) as a NSS database control point (NSS-DBCP).

Hardware requirements

NSS-DBCP Travel Card Number Validation has no hardware requirements.

Limitations and restrictions

NSS-DBCP Travel Card Number Validation has no limitations or restrictions.

Interactions

NSS-DBCP Travel Card Number Validation has no functionality interactions.

Datafill

NSS-DBCP Travel Card Number Validation does not affect data schema tables or office parameters.

Service orders

NSS-DBCP Travel Card Number Validation does not affect SERVORD.

Operational measurements

NSS-DBCP Travel Card Number Validation does not affect operational measurements.

Logs

NSS-DBCP Travel Card Number Validation does not affect logs.

User interface

NSS-DBCP Travel Card Number Validation does not change the user interface.

Billing

NSS-DBCP Travel Card Number Validation does not affect billing.

AD3064**Attendant consoles on IPEs**

Functionality name

Attendant Consoles on IPEs

Description

This feature provides the software and verification required to support MSL-100 Attendant Consoles (ACs) attached to MSL-100 Intelligent Peripheral Equipment (IPE) analog lines.

Hardware requirements

This feature requires an MSL-100 IPE equipped with an Extended Message Waiting Line Card (XMLC) and an Extended Analog Line Card (XALC).

Limitations and restrictions

Without this feature, attendant consoles attached to an IPE analog line are not supported. No functionality is added to attendant console call or feature processing. Consoles attached to IPEs operate in the same manner as consoles attached to either Line Modules (LMs) or Line Concentrating Modules (LCMs).

Interactions

Consoles attached to IPEs operate in the same manner as consoles attached to either LMs or LCMs.

Datafill

In order to datafill ACs on an IPE analog line, changes to two tables are required. The Lines Inventory Table LNINV is altered to accept analog lines on an IPE XMLCs or XALC. Table IBNLINES is changed to accept AC line datafill on lines associated with IPEs.

For verification, no changes to existing CC AC call processing/feature processing or XPM software occurs.

Service Orders

Attendant Consoles on IPEs does not affect SERVORD.

Operational measurements

Consoles attached to IPEs peg the same OM groups and registers as consoles attached to LMs and LCMs.

AD3064

Attendant consoles on IPEs (end)

Logs

No new logs are created for this feature. However, all logs currently implemented for ACs attached to other Line Concentrating Devices (LCDs) are generated for ACs attached to IPEs as well.

User interface

Attendant Consoles on IPEs does not change the user interface.

Billing

Attendant Consoles on IPEs does not affect billing.

AD3092**Broadcast table control enhancements**

Functionality name

Broadcast Table Control Enhancements

Description

This feature provides the table control modifications required to classmark a trunk group for potential use for secondary fan-out in a broadcast call. This feature also includes a new office parameter to define the requirements for internal resource allocation. Internal resource allocation is required based on the maximum number of output ports actively involved in a broadcast call.

Hardware requirements

Broadcast Table Control Enhancements has no hardware requirements.

Limitations and restrictions

Broadcast Table Control Enhancements has no limitations or restrictions.

Interactions

Broadcast Table Control Enhancements has no functionality interactions.

Datafill

A new option, BCREMOTE, is added to Table TRKGRP. This option classmarks the IBN trunks (IBNTO and IBNT2) as capable of secondary fan-out. Secondary fan-out is an interswitch link that serves as a single common input broadcasting to multiple destinations in a remote office.

The BCREMOTE option is only valid for IBN trunk groups datafilled to use ANSI CCS7 signaling protocol.

A new office parameter, NO_OF_CLONE_TIDS, is added to Table OFCENG. Clone Terminal Identifiers (TIDS) are internal entities used to provide linkage from the input to each output port in a broadcast call. This new office parameter defines the number of clone TIDS engineered for the office. This office parameter represents the sum of the maximum number of active concurrent output ports in all broadcast calls supported in the office at any one time.

The NO_OF_CLONE_TIDS parameter has a range between 0 and 32,000. If one clone TID is needed per output report, and up to 1000 trunks are supported with an average of 8 destinations each, a maximum of 8000 clone TIDS are needed for the broadcast features. Since clone TIDS are not broadcast specific, additional clone TIDS are allocated for other uses.

AD3092

Broadcast table control enhancements (end)

This office parameter is limited in number to 32,000. The limiting factor is the number of concurrent broadcast output ports supported at one time, 8000, plus 24,000 more for non-broadcast specific applications.

The number of clone TIDS, once allocated, cannot be reduced.

Service Orders

Broadcast Table Control Enhancements does not affect SERVORD.

Operational measurements

Broadcast Table Control Enhancements does not affect operational measurements.

Logs

Broadcast Table Control Enhancements does not affect logs.

User interface

Broadcast Table Control Enhancements does not change the user interface.

Billing

Broadcast Table Control Enhancements does not affect billing.

AD3093

Broadcast Fan-Out Nodal Setup

Functionality name

Broadcast Fan-Out Nodal Setup

Description

This feature allows the broadcasting of one source to multiple destinations. This feature uses integrated business networks (IBN) Integrated Services Digital Network User Part (ISUP) trunks with ISUP messages received from the control component.

The initial broadcast call is established with one connection from a single input port to a single output port. The maximum number of connections to a single incoming port is 16. Each additional connection may be progressively added after initial call setup. Each additional connection is unidirectional from the input to the output port.

A broadcast call is established with ISUP messages from the control component. The control component is an external signaling link interface to the MSL-100. The signaling link associated with the input port is directly connected to the control component.

Hardware requirements

Broadcast Fan-Out Nodal Setup has the following hardware requirements:

- MSL-100 SuperNode with a line peripheral processor (LPP)
- a two-node network of MSL-100 switches
- IBN ISUP trunks as input and output ports

Limitations and restrictions

The following limitations and restrictions apply to Broadcast Fan-Out Nodal Setup:

- This feature is only available on the MSL-100 equipped with an LPP.
- Customer premise equipment (CPE) is used to ensure unidirectional transmission (for voice and data).
- All broadcast call control information is provided through ISUP messaging in the form of directory numbers (DN). DNs supplied in the ISUP INF message must translate to an IBN ISUP trunk agency for successful termination. No virtual DN mapping to any preset destinations is supported.
- Remote broadcast sessions are not supported.

AD3093

Broadcast Fan-Out Nodal Setup (continued)

- No special error recovery is provided to re-establish a previously established call upon failure (other than what is currently provided by Common Channel Signaling System No. 7). Loss of connections must be reinitiated from the control component.
- ISUP release in the forward direction terminates the broadcast call.
- Individual progressive release of terminating agents in the backward signaling direction is supported. ISUP release of a terminating agent disconnects the agent without affecting other established connections in the broadcast session.
- Broadcast sessions do not support multi-level precedence and preemption (MLPP) or Defense Switch Network (DSN) world wide numbering plan (WWNP).
- All add-ons must be initiated from the originating control component on the signaling link associated with the input port in the primary broadcast.
- The time necessary to set up a broadcast call and connect progressive add-ons is directly related to the existing translation and routing time within the MSL-100.
- Translations based on network class of service are supported. Scope Dial class of service is not supported.
- The MSL-100 does not store network configuration information for any other switches in the network.
- Network configuration and network maintenance are handled by an external system.
- The number of simultaneous broadcast connections is restricted by the switching system's call processing and datafill capacity.
 - Up to 16 links are in a link set.
 - Up to 8,192 trunk groups are on an MSL-100.
 - Up to 16,384 trunk members are in a link set.
 - Up to 32,767 medium feature data blocks are allowed. Each input and output port actively involved in a call requires one medium feature data block.
 - Up to 32,767 feature control blocks are allowed. Each input and output port actively involved in a call requires one feature control block.
- A maximum of four DNs are contained in an ISUP information message requesting broadcast add-ons.

AD3093**Broadcast Fan-Out Nodal Setup (end)**

- Continuity tests are disabled for broadcast connections because they are only valid on two-way PCM connections.
- Survivability of a broadcast call over a CC switch activity (SWACT) is not supported.
- Destination numbers for add-on parties are limited to a maximum of 15 digits.

Interactions

The following paragraphs describe the interactions between Broadcast Fan-Out Nodal Setup and other functionalities.

Existing automatic message accounting (AMA) billing on IBN ISUP trunks is not generated for broadcast calls.

Datafill

Table modifications required to identify broadcast agents as remote for secondary broadcast sessions are implemented by feature AD3092, Broadcast Table Control Enhancements.

Service orders

Broadcast Fan-Out Nodal Setup does not affect SERVORD.

Operational measurements

Broadcast Fan-Out Nodal Setup does not affect operational measurements.

Logs

Broadcast Fan-Out Nodal Setup does not affect logs.

User interface

Broadcast Fan-Out Nodal Setup does not change the user interface.

Billing

AMA and SMDR billing are not generated for broadcast connections.

AD3257

Power Call Processing Architecture Enhancements

Functionality name

Power Call Processing Architecture Enhancements

Description

This feature is responsible for two tasks:

- Trunk selection enhancements
- Preset broadcast calls

Trunk selection enhancements

This feature, through translations, terminates to a trunk circuit based on the dialed directory number (DN). This is accomplished by providing a new selector, MEM, in table DNROUTE and table OFRT. The MEM selector already exists for table OFRT but is now integrated into MSL-100 loads. The selector contains information identifying the trunks circuit for termination. A DN that translates to this selector terminates to the datafilled trunk circuit or range of circuits.

When the selector is present in table DNROUTE, and the trunk circuit to which the DN translates is unavailable, the call routes to treatment. When the selector is present in table OFRT, and the trunk circuit to which the DN translates is unavailable, the call continues to the next route in the route list. When all possible routes in the route list are exhausted, the call routes to treatment.

Preset broadcast calls

This feature activates a broadcast call. Users perform the initial set up of a broadcast call by supplying a specific DN and a preset broadcast activation number. Associated with this preset broadcast activation number are up to eight terminating DNs. Activation of a preset broadcast call in this manner creates a unidirectional connection from the originator to the preset terminators.

Hardware requirements

Power Call Processing Architecture Enhancements has no hardware requirements.

Power Call Processing Architecture Enhancements (continued)

Limitations and restrictions

The following limitations and restrictions apply to Power Call Processing Architecture Enhancements for trunk selection enhancements and preset broadcast calls:

- trunk selection enhancements
 - The MEM selector allows specification of only one trunk group Common Language Location Identifier (CLLI) and one external member number for table DNROUTE.
 - The MEM selector is valid for Integrated Business Network (IBN) trunks.
 - Table OFRT is limited to 1024 routing lists. The list entries are not used exclusively for the MEM selector.
 - The MEM selector in DNROUTE cannot use a trunk with the automatic call distribution (ACD) option because of the limitations of table DNROUTE.
 - Datafill of the MEM selector is limited to 8000 items. An item is any DN in table DNROUTE set to use the MEM selector or any route in a route list datafilled with the MEM selector.
 - Off hook queuing and call back queuing are not supported with the MEM selector.
 - The command Query Directory Number (QDN) is not supported for DNs used as MEM selectors in table DNROUTE.
- preset broadcast calls
 - All add-ons must be initiated from the originating control component on the signaling link associated with the input port in the primary

AD3257

Power Call Processing Architecture Enhancements (continued)

broadcast. This is after the preset broadcast call has been established by table BROADCAST.

- Table BROADCAST allows the datafill of eight legs for each preset broadcast call.
- An entry in table BROADCAST must have at least one DN datafilled in field BDCTADDR.
- The maximum number of preset broadcast calls is 64.
- Add-ons can only be added after the preset broadcast call is initiated.
- There is a maximum of 16 output ports that are DNs. If nine DNs use 16 output ports, only nine DNs will be supported.
- The preset terminators in table BROADCAST cannot be other preset broadcast activation numbers.
- A preset broadcast activation number coming through an add on INF message is not allowed.
- The command QDN is not supported for DNs that represent activation of the preset broadcast feature.

Interactions

The following paragraphs describe the interactions between Power Call Processing Architecture Enhancements and other functionalities.

Trunk selection enhancements

The DN in the optional parameter of the CPG message does not indicate a one-to-one mapping with a trunk for broadcast call applications in table OFRT. The DN in the optional parameter of the CPG message does indicate a one-to-one mapping to the route list for broadcast call applications in table OFRT.

Preset broadcast calls

A CPG is used to acknowledge a broadcast call initiated or subsequently added on by an INF message. No such hand shaking mechanism is used for activation using the preset broadcast call method.

Datafill

Trunk selection enhancements

Table DNROUTE is changed to allow direct routing to a trunk member. This is done by adding a MEM selector to the DN_SEL field of table DNROUTE that indicates direct termination to the specified trunk circuit member.

AD3257

Power Call Processing Architecture Enhancements (end)

Preset broadcast calls

New table BROADCAST defines up to 64 predefined broadcast sessions.

Table DNINV changes to allow the datafill of BDCT, a new feature selector. A DN with this selector will translate to a predefined broadcast session.

Service orders

Power Call Processing Architecture Enhancements does not affect SERVORD.

Operational measurements

Power Call Processing Architecture Enhancements does not affect operational measurements.

Logs

Power Call Processing Architecture Enhancements does not affect logs.

User interface

Power Call Processing Architecture Enhancements does not change the user interface.

Billing

Power Call Processing Architecture Enhancements does not affect billing.

AD3259

Broadcast Interworking/Feature Interactions

Functionality name

Broadcast Interworking/Feature Interactions

Description

This feature allows a broadcast call to terminate to integrated business network (IBN) per trunk signaling (PTS) trunks and IBN stations (2500/500 sets, Meridian business set, integrated voice data set, and basic rate access set). It also allows a broadcast call to IBN ISDN User Part (ISUP) trunks. The originator of a broadcast is always an IBN ISUP trunk.

This feature allows new terminators to be added locally to the secondary node of a broadcast call by sending an ISUP information message (INF) to any existing IBN ISUP terminator at the secondary node.

Hardware requirements

Broadcast Interworking/Feature Interactions has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Broadcast Interworking/Feature Interactions:

- The controller of a broadcast call must be an IBN ISUP trunk.
- Preemption of SCOPEDIAL stations involved in a broadcast call is not supported.
- A PTS trunk as a terminator does not support network fanout (fanout at node two or further).
- A call progress (CPG) message is sent to the controller of the broadcast call (not to the terminating trunk that received the add-on request) if a local add-on from the terminating side at a remote node fails.
- At least one of the terminators at a remote node should be an IBN ISUP trunk to send a local add-on request at the remote node.
- Only IBN dual-tone multi-frequency (DTMF), multi-frequency (MF), and dial pulse 2-wire (DP2W) and outgoing (OG) trunks of standard signaling type and DS1SIG cardcode are supported for IBN PTS trunk termination.
- Only one directory number (DN) at each station should be datafilled for a preset broadcast in table BROADCAST. This restriction is for line termination.
- The maximum number of terminators in a broadcast call is 16.

AD3259

Broadcast Interworking/Feature Interactions (end)

Interactions

Broadcast Interworking/Feature Interactions has no functionality interactions.

Datafill

Broadcast Interworking/Feature Interactions does not affect data schema tables or office parameters.

Service orders

Broadcast Interworking/Feature Interactions does not affect SERVORD.

Operational measurements

Broadcast Interworking/Feature Interactions does not affect operational measurements.

Logs

Broadcast Interworking/Feature Interactions does not affect logs.

User interface

Broadcast Interworking/Feature Interactions does not change the user interface.

Billing

Automatic message accounting (AMA) billing is supported for the broadcast call. Station message detailed recording (SMDR) records are generated for each leg of the broadcast call. A billing record for each terminating leg of a broadcast call shows the controller's trunk group and trunk member number as originator, and terminating agent as terminator. No billing record is generated for the controller's call.

AD3285

NAS RLT IBN ISUP trunk interactions

Functionality name

NAS RLT IBN ISUP Trunk Interactions

Description

This feature provides the necessary bridging capabilities that allows condensing a call and releasing unnecessary trunks to the attendant node. This feature also merges the original call and the second call placed by the attendant at the connecting, or bridging, node. These bridging capabilities apply to Integrated Business Network (IBN) ISDN User Part (ISUP) trunks and ISUP trunks connected to the attendant node.

Call bridging

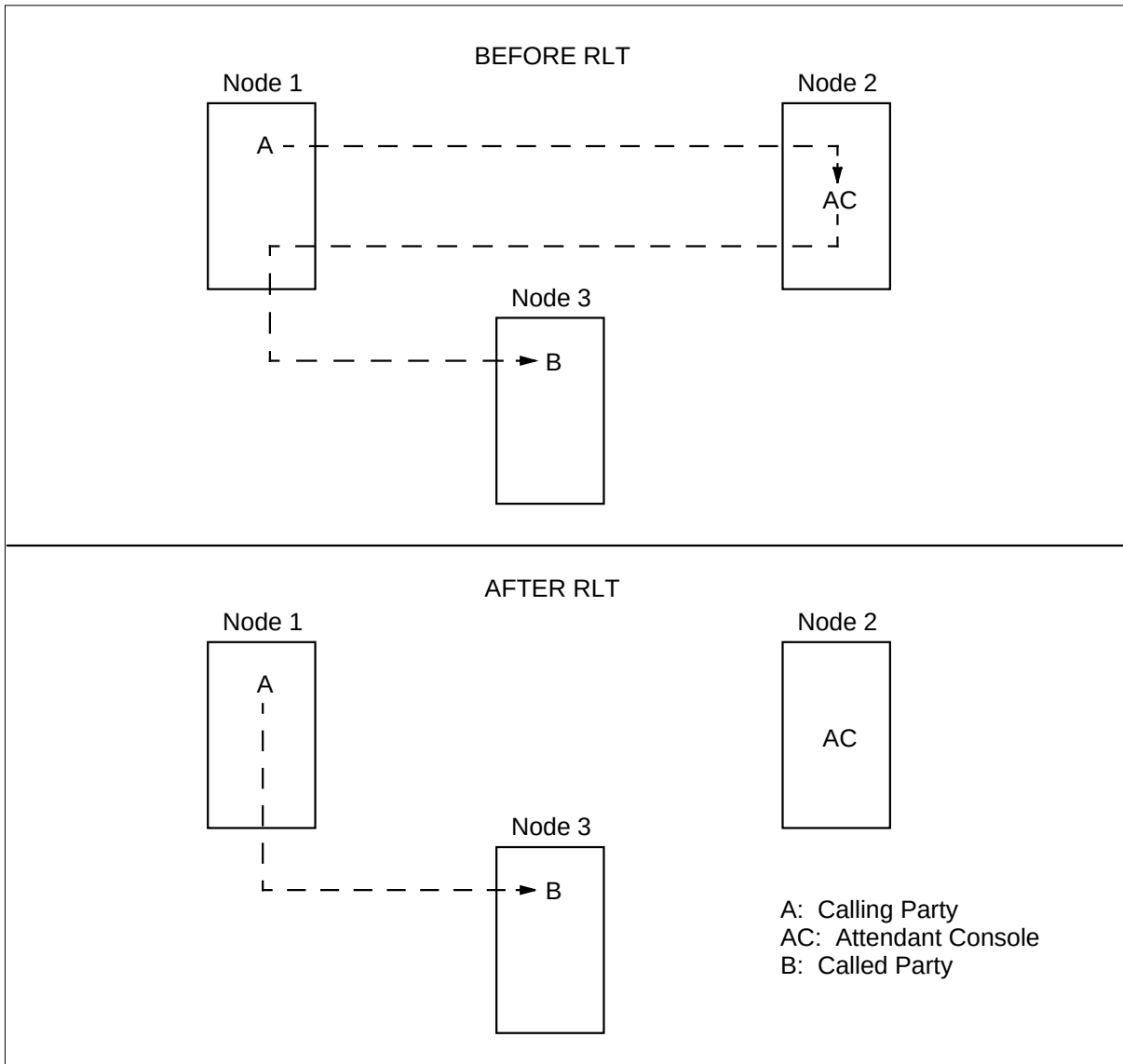
The following situations are possible NAS RLT bridging scenarios:

- The attendant extends an incoming call that is routed back to the connecting node. The attendant releases the call and accomplishes NAS RLT functionality after the called party answers. See the following figure for an example of this bridging scenario. This type of bridging is also known as automatic activation of NAS RLT.
- The attendant receives an incoming call that is to be extended to another party. The attendant determines that this call is to be an NAS RLT call and presses the NAS RLT Incoming Call Identification (ICI) key. The attendant enters the extending Directory Number (DN) and presses the Release key. The system then bridges the call. (Refer to NAS RLT Attendant Console Special Function Key for more information on the NAS RLT ICI key.) This type of bridging is also known as manual activation of NAS RLT.

If the attendant extends an NAS RLT call that is to be routed to a different node than the bridging node, the system forces the call back to the bridging node. The system routes the call to the same trunk group as the incoming call.

If the attendant extends an NAS RLT call that is to be routed to the same node as the bridging node, the system does not force the call to use the same trunk group as the incoming call. However, if the trunk selected to route to the bridging node is not an IBN or ISUP trunk, then the system forces the call to route to the same ISUP trunk group as the incoming call. IBN or ISUP trunks must be used to achieve the NAS RLT functionality.

Note: The NAS RLT function cannot be invoked if the 3 Way Call (3WC) feature is activated.

AD3285**NAS RLT IBN ISUP trunk interactions (continued)****NAS RLT example when attendant extends call****Bridging failures**

The following failures can occur when bridging a call at the bridging node:

- If the extended call is not normally routed to the bridging node, then the incoming and outgoing trunks at the attendant node must be in the same ISUP trunk group for NAS RLT to be invoked. If an outgoing trunk is not available in the same trunk group as the incoming trunk, the system routes

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NAS RLT IBN ISUP trunk interactions (continued)

the call using normal translations and pegs the NRLTNOTK Operational Measurement (OM) at the attendant node.

- If the Call ID of the second call is not received in the Facility Accept Message (FAA) at the attendant node, then the system cannot bridge the call. The system prints log NRLT100 at the attendant node in response to the failed bridge.

Note: All NAS RLT logs and OMs originate at the attendant node.

The NAS RLT feature cannot be invoked unless the attendant releases the call at some point before or after the called party answers. If the attendant does not release, then resources remain, and no action is taken.

There may be some cases where the incoming and outgoing agents at the bridging node (from the calling and to the called parties) are incompatible. For example, a PTS trunk (as incoming agent) and an IBN T2 trunk (as outgoing agent) are incompatible for bridging. The system cannot invoke the NAS RLT function in this case and sends an Facility Reject (FRJ) message from the bridging node to the attendant node indicating a failure to bridge. The system pegs the OM NRLTAGIN in response to this event.

If the extended call is not normally routed to the bridging node, then the system can invoke the NAS RLT function only if the incoming and outgoing trunks at the attendant node are part of the same ISUP trunk group. The system sends the call through normal translations if an outgoing trunk is not available in the same trunk group as the incoming trunk. The attendant node pegs the OM NRLTNOTK in response to this event.

If the attendant node does not receive the call ID of the second call in the FAA message, the system cannot bridge the call. The attendant node generates the NRLT100 log in response. However, if the call reference received in the FAR message is invalid, the system cannot bridge the call. The attendant node generates the NRLT101 log in response.

Note: The NAS RLT feature cannot be invoked when a call originates from another attendant console other than the one with NAS RLT functionality.

Hardware requirements

NAS RLT IBN ISUP Trunk Interactions has no hardware requirements.

AD3285**NAS RLT IBN ISUP trunk interactions** (continued)

Limitations and restrictions

The following limitations and restrictions apply to NAS RLT IBN ISUP Trunk Interactions:

- A uniform dialing plan must be used throughout the network.
- The called party must answer and the attendant must release the call before NAS RLT is invoked (unless the attendant uses the NAS RLT ICI key).
- IBN or ISUP trunks must be used between the bridging and attendant nodes.
- 3WC must not be active.
- The originating attendant console must have the NAS RLT option.

Interactions

The system does not provide the following features once the attendant activates NAS RLT and bridges the call:

- Network attendant recall
- Network serial recall
- Network attendant flash

The Basic Rate Access Functional Set (BRAFS) display shows the name of the called party, under the following conditions, if the name is datafilled for that party:

- the calling party is a BRAFS set, and the called party is on the same node
- the called party is a BRAFS set, and the calling party is on the same node

However, if the calling and called parties are not on the same node, then the BRAFS set display shows the Common Language Location Identifier (CLLI) of the involved trunk twice. The CLLI displayed first identifies the connected party, and the second CLLI identifies the party that caused the transfer to occur. For NAS RLT, the BRAFS display shows the same CLLI twice because the two parties are the same.

Datafill

NAS RLT IBN ISUP Trunk Interactions does not affect data schema tables or office parameters.

Service orders

NAS RLT IBN ISUP Trunk Interactions does not affect SERVORD.

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NAS RLT IBN ISUP trunk interactions (end)

Operational measurements

Refer to the Bridging Features section for more information on operational measurements.

Logs

Refer to the Bridging Features section for more information on logs.

User interface

NAS RLT IBN ISUP Trunk Interactions does not change the user interface.

Billing

NAS RLT IBN ISUP Trunk Interactions does not affect billing.

AD3286**NAS RLT AC special function key**

Functionality name

NAS RLT AC special function key

Description

This feature allows an attendant to activate the NAS RLT function from a key on the Attendant Console (AC). Normally this function is activated automatically when the attendant releases the call and the called party answers. However, the NAS RLT function can occur whether the called party answers or not. NAS RLT can occur when the attendant presses the special function key and releases the call, not when the called party answers.

To allow an NAS RLT-eligible call to be bridged, the Incoming Call Identification (ICI) key on the AC must be assigned to NAS RLT. This key allows the attendant to release the call and activate NAS RLT before the called party answers. Once the attendant releases the trunks using the NAS RLT ICI key, the following functions are not available: Network Attendant Recall, Network Serial Recall, and Network Attendant Flash.

This feature can also be implemented from a wild card key. Presently an attendant can access features assigned to console keys. The AC provides up to 42 assignable keys for both ICI and features on the console (14 on basic console, 28 on add-on module). Wild card keys preserve the number of keys used by invoking special features not directly available on that console through a feature key.

This feature adds two new wild card codes for the NAS RLT function (activation and deactivation). This code allows the attendant to release the call and activate NAS RLT before the called party answers. However, once the attendant releases the trunk using the wild card code, the call cannot use Network Attendant Recall, Network Serial Recall, nor Network Attendant Flash.

Hardware requirements

NAS RLT AC special function key has no hardware requirements.

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NAS RLT AC special function key (continued)

Limitations and restrictions

The following limitations and restrictions apply to NAS RLT AC special function key::

- The NAS RLT function cannot be invoked if the 3 Way Call (3WC) feature is activated.
- The NAS RLT feature cannot be invoked when a call originates from another attendant console, other than the one with NAS RLT functionality.

Interactions

To allow an NAS RLT-eligible call to be bridged, the ICI key on the AC must be assigned to NAS RLT. This key allows the attendant to release the call and activate NAS RLT before the called party answers. Once the attendant releases the trunks using the NAS RLT ICI key, the following functions are not available: Network Attendant Recall, Network Serial Recall, and Network Attendant Flash.

Datafill

Table FNMAP, field SPFN, must be datafilled as NRLT to dedicate the ICI key and lamp to the NAS RLT feature. This table also contains pertinent information that identifies the console CLLI, which points back to table CLLI, and the AC key and lamp number.

Table WCKCODES implements the wild card codes for NAS RLT activation and deactivation. Field WCSPFN must be datafilled as NRLT to provide the activation capability to the attendant and must be datafilled as NRLTD to provide the deactivation capability.

Service Orders

NAS RLT AC special function key does not affect SERVORD.

Operational measurements

NAS RLT AC special function key does not affect operational measurements.

Logs

NAS RLT AC special function key does not affect logs.

User interface

This feature can also be implemented from a wild card key. Presently an attendant can access features assigned to console keys. The AC provides up to 42 assignable keys for both ICI and features on the console (14 on basic

AD3286**NAS RLT AC special function key** (continued)

console, 28 on add-on module). Wild card keys preserve the number of keys used by invoking special features not directly available on that console through a feature key.

This feature adds two new wild card codes for the NAS RLT function (activation and deactivation). This code allows the attendant to release the call and activate NAS RLT before the called party answers. However, once the attendant releases the trunk using the wild card code, the call cannot use Network Attendant Recall, Network Serial Recall, nor Network Attendant Flash.

Activating NAS RLT with ICI key

If the datafill has been established, the NAS RLT ICI key lights when the attendant receives and answers NAS RLT-eligible calls. (The call must originate on an IBN or AUTOVON ISUP 2-way trunk, and the attendant must have option NRLT datafilled in table CUSTNTWK. This option specifies that NAS RLT is available for the associated network customer group.) The attendant initiates NAS RLT by pressing the ICI key assigned to NAS RLT. The system prompts the attendant for the second call destination. The attendant then enters the destination number followed by a pound sign (#) and presses the Release key. The system initiates the second call after the pound key has been pressed.

Note: If the attendant presses an idle loop key and presses the NAS RLT ICI key, the AC display shows DISALLOWED.

Deactivating NAS RLT with ICI key

If an attendant manually activates NAS RLT by pressing the NAS RLT ICI key, then the attendant can deactivate NAS RLT by pressing the Release Destination key before pressing the Release key. This action cancels manual activation of NAS RLT. However, if the attendant presses the Release Destination key after entering a complete destination and launching the call, the system releases that destination and turns off the NAS RLT ICI lamp. If the attendant extends the call again, it is not considered to be NAS RLT-eligible, and the NAS RLT ICI lamp remains off.

If an attendant manually activates NAS RLT by pressing the NAS RLT ICI key, then both automatic and manual NAS RLT can be deactivated by pressing the ICI key again. The AC display shows DEACTIVATED, and the incoming call is not considered to be NAS RLT-eligible.

Once the attendant receives and answers an NAS RLT call, the NAS RLT ICI key lights. If manual activation of NAS RLT is not desired, then NAS RLT is

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NAS RLT AC special function key (end)

automatically activated once the called party answers and the attendant releases the call. However, if the attendant decides not to use NAS RLT functionality, automatic activation is canceled by pressing the NAS RLT ICI key twice. The AC display shows DEACTIVATED, and the incoming call is not considered to be NAS RLT-eligible.

Reactivating NAS RLT with ICI key

Once NAS RLT has been deactivated for a call, the function can be reactivated by pressing the NAS RLT ICI key if the call has not yet been extended. The key lights, and the AC display shows NRLT REACTIVATED. At this point, NAS RLT can be activated either automatically or manually.

Automatic activation occurs when the attendant releases the extended call and the called party answers. However, manual activation requires that the attendant press the NAS RLT ICI key again, enter the destination number and #, and press the Release key.

If the attendant extends the call and attempts to reactivate NAS RLT, the AC display shows DISALLOWED. However, one exception exists. If the attendant extends the call and it returns to the originating node, the call becomes available for NAS RLT, and the AC display shows NRLT REACTIVATED. Only automatic activation is available at this point.

Activating NAS RLT with wildcard key code

The NRLT wild card key code provides manual activation of the NAS RLT function if the attendant does not have access to an NAS RLT ICI key. The attendant activates manual NAS RLT by pressing the NRLT wild card key.

Deactivating NAS RLT with wild card key code

After the NRLT wild card key activates NAS RLT, the NRLTD wild card key code provides manual deactivation of the NAS RLT function if the attendant does not have access to an NAS RLT ICI key. The attendant deactivates manual NAS RLT by pressing the NRLTD wild card key. Once the attendant presses the NRLTD wild card key, the AC display shows DEACTIVATED.

Reactivating NAS RLT with wild card key cod

After the NRLTD wild card key deactivates NAS RLT, the NRLT wild card key provides reactivation of the NAS RLT function if the attendant does not have access to an NAS RLT ICI key. The attendant reactivates manual NAS RLT by pressing the NRLT wild card key.

Billing

NAS RLT AC special function key does not affect billing.

AD3287**NAS RLT table control and ISUP messaging**

Functionality name

NAS RLT Table Control and ISUP Messaging

Description

This feature provides the table control (datafill) and ISUP messaging required to implement the RLT function for MSL-100 networks that use the Network Attendant Service (NAS).

A network with NAS RLT capability requires that translations in the systems be changed to route calls to the attendant node over a two-way ISUP trunk. The system routes a call from its node to the attendant node when translations determine that a call requires attendant assistance. The system connects the call to an available attendant at an Attendant Console (AC). If the attendant extends the call, then the system establishes an additional path from the attendant node to the called party. Once the call terminates, the attendant releases from the call, and the system releases the unnecessary trunks and bridges the call if the call returns to the bridging node.

Note: The NAS RLT function cannot be invoked if the 3 Way Call (3WC) feature is activated. Also, when a call originates from another attendant console other than the one with NAS RLT functionality, the NAS RLT feature cannot be invoked.

ISDN User Part (ISUP) messaging

This feature provides the ISUP messaging necessary to initiate NAS RLT capability on MSL-100 ISUP trunks. The MSL-100 network uses the following ISUP messages to initiate an NAS RLT call. Refer to NAS RLT Call Scenarios in this chapter for more information on how these messages are used.

- Initial Address Message (IAM)
- Address Complete Message (ACM)
- Reconfiguration Progress Message (RPM)
 - RPM Extended Message
 - RPM Extension Complete Message
- Facility Request message (FAR)
- Facility Accept message (FAA)
- Facility ReJect message (FRJ)

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NAS RLT table control and ISUP messaging (continued)

Initial address message

The system sends the IAM to the node of the called party when the attendant extends the original call. The IAM also contains the Calling Party Category (CPC). If the attendant initiates the call, the system sets the CPC value to indicate attendant console origination.

Address complete message

The node of the called party sends the ACM after receiving the IAM. The ACM contains CPC and NETINFO of the called party.

Reconfiguration progress message

This proprietary message, enclosed within a Pass Along Message (PAM), is sent to the nodes of both the calling and called parties for display functionality purposes. The attendant node sends the following RPMs:

- RPM Extended Message — sent to the nodes of the calling and called parties when the attendant releases the call before the called party answers
- RPM Extension Complete Message — sent to the nodes of the calling and called parties only after the called party answers and the attendant releases the call

Facility request message

The attendant node sends a FAR under the following circumstances:

- To the second call at the bridging node to request the call ID of the second call. (This feature adds a specific value to the FAR that indicates that the call ID is being requested.)
- To the first call at the bridging node to initiate the bridging. A new facility indicator (NAS_RLT_WITH_3RD_PTY) in the FAR indicates NAS RLT with third-party interaction. This message contains the call reference of the second call at the bridging node.

Facility accept message

The bridging node sends an FAA under the following circumstances:

- To the attendant node after receiving an FAR requesting the call ID of the second call. (This feature adds the requested call ID as a new parameter of the FAA.)
- To the attendant node to indicate acceptance of the FAR. The bridging node sends this message only if the call is about to be successfully bridged.

AD3287**NAS RLT table control and ISUP messaging (continued)****Facility reject message**

The bridging node sends the FRJ to the attendant node to indicate that bridging failed. The FRJ contains a specific cause value that specifies the reason for the failure at the bridging node.

NAS RLT call scenarios

Figure 1 through Figure 5 show RLT call flow diagrams for the following NAS RLT call types:

- Call extended from calling to called parties via attendant (Call Type 1)
- Call released before called party answers (Call Type 2)
- Call placed and disconnected from calling party to attendant, then calls placed from attendant to called and calling parties (Call Type 3)

The following call type descriptions use the following terms: terminating node (corresponds to Node 1 in the figures), bridging node (corresponds to Node 2 in the figures), and attendant node (corresponds to Node 3 in the figures).

Call type 1

Figure 1 and Figure 2 show the call flow for Call Type 1. Figure 1 shows the call flow from the calling party to the attendant. Figure 2 shows call flow as the attendant extends and releases the call, and the system bridges the call.

Because the extended call to the called party initiates at an Attendant Console (AC), the system sets the Calling Party Category (CPC) in the IAM to an AC value. The IAM, also containing the attendant NETINFO, is sent to the bridging and terminating nodes. After receiving the IAM, the bridging node sends an ACM to the attendant node, and the terminating node sends an ACM to the bridging node.

Once the called party answers, the terminating node sends an ANM to the attendant node, and the attendant releases the call. The attendant node then sends an RPM Extension Complete message to the bridging and terminating nodes and an FAR to the bridging node requesting the call ID of the second call. The bridging node then responds with an FAA containing the call ID to the attendant node.

If the FAA does not contain the call ID of the second call, the system generates the log NRLT100 at the attendant node. Refer to the *Log Report Reference Manual* for additional information.

The call reference within the FAA is reformatted into an FAR, which is sent to the first call at the bridging node. This FAR requests that the calls be bridged. If the call reference is invalid, the bridging node sends an FRJ to the attendant

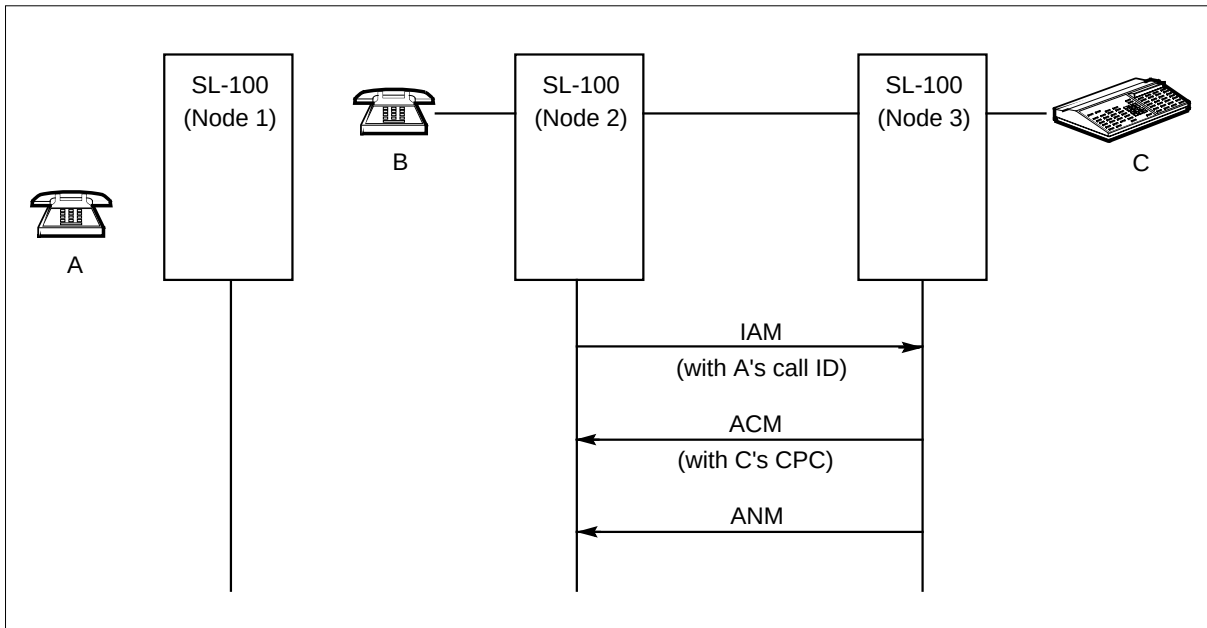
AD3287**NAS RLT table control and ISUP messaging (continued)**

node. The system generates a corresponding log, NRLT101, at the attendant node.

The bridging node checks the facility indicator in the FAR to determine which function to perform. This example assumes a facility indicator of NAS_RLT_WITH_3RD_PTY. The call reference then is used to find the associated call at the bridging node. After the call is found, the system bridges the calling party to the called party.

Once the call is bridged, the bridging node sends an FAA to the attendant node to indicate FAR acceptance and call bridging. The bridging node sends a RElease message (REL) to release the connection, and the attendant node responds with a ReRelease Complete message (RLC) to both call legs.

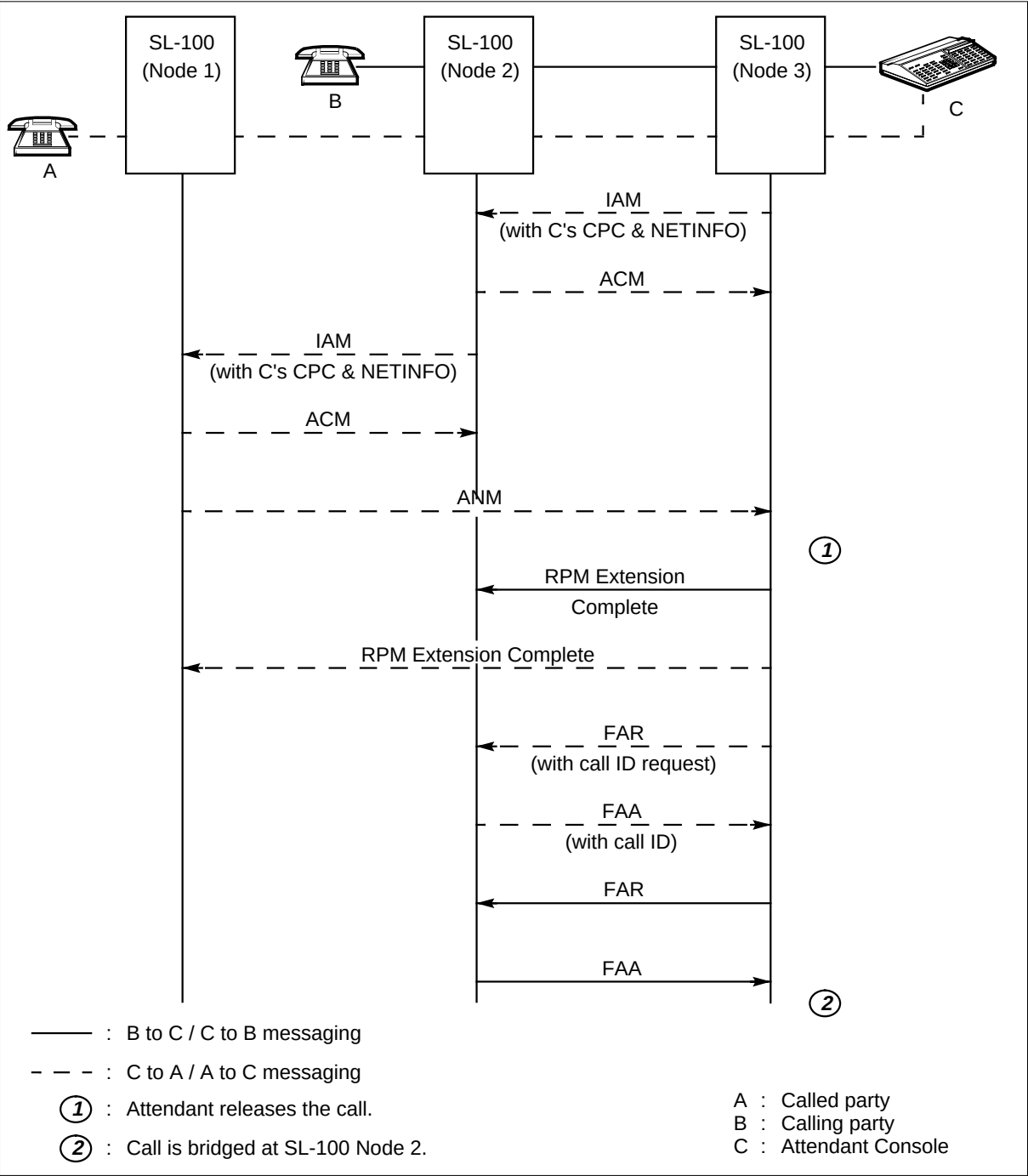
Figure 1, NAS RLT call type 1 (calling party to attendant)



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NAS RLT table control and ISUP messaging (continued)

Figure 2, NAS RLT call type 1 (attendant to called party and bridging)



AD3287**NAS RLT table control and ISUP messaging** (continued)

Call type 2

Figure 3 shows the call flow for Call Type 2 that involves the attendant releasing the original call before the called party answers. This example begins just as the example for Call Type 1. Because the extended call to the called party initiates at an Attendant Console (AC), the system sets the Calling Party Category (CPC) in the IAM to an AC value. The IAM, also containing the attendant NETINFO, is sent to the bridging and terminating nodes. After receiving the IAM, the bridging node sends an ACM to the attendant node, and the terminating node sends an ACM to the bridging node.

At this point, the attendant releases the call before the called party answers. The attendant node then sends an RPM Extended message to both nodes indicating that the attendant has released the call and that it has been extended.

The called party answers, and the terminating node sends an ANM to the attendant node. Once the ANM is received, the attendant node sends an RPM Extension Complete message to both nodes and an FAR to the second call at the bridging node. The FAR requests the call ID of the second call. The bridging node responds to this request by sending an FAA, containing the call ID, to the attendant node.

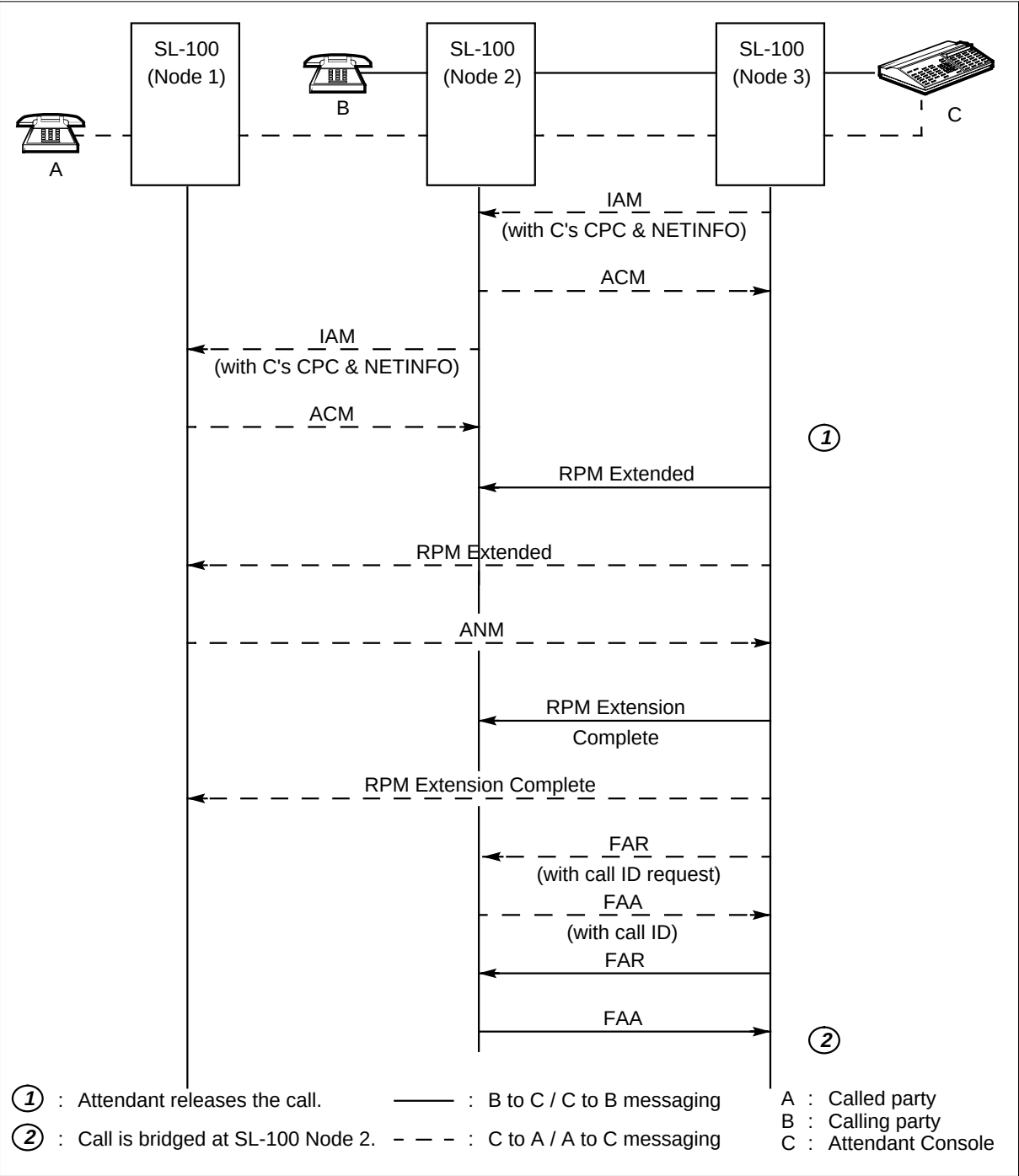
The call reference within the FAA is reformatted into an FAR, which is sent to the first call at the bridging node. This FAR requests that the calls be bridged. The bridging node checks the facility indicator in the FAR to determine which function to perform. This example assumes a facility indicator of NAS_RLT_WITH_3RD_PTY. The call reference then is used to find the associated call at the bridging node. After the call is found, the system bridges the calling party to the called party.

Once the call is bridged, the bridging node sends an FAA to the attendant node to indicate FAR acceptance and call bridging. The bridging node sends an REL to release the connection, and the attendant node responds with an RLC to both call legs.

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NAS RLT table control and ISUP messaging (continued)

Figure 3, NAS RLT call type 2 (attendant releases call before called party answers)



AD3287**NAS RLT table control and ISUP messaging** (continued)

Call type 3

Figure 4 and Figure 5 show the call flow for Call Type 3. Figure 4 shows the call flow as the calling party places the original call to the attendant. Both parties disconnect, and the attendant replaces the call at a later time.

The calling party places a call to the attendant at the attendant node. The calling party's node sends an IAM to the attendant node with the calling party's call ID and NETINFO. The attendant node responds with an ACM that contains the attendant CPC and an ANM that indicates call answer. At this point, the attendant notifies the calling party that the connection must be made at a later time.

The attempt to make call connection is reinitiated by the attendant. Because the reinitiated call originates at an Attendant Console (AC), the system sets the Calling Party Category (CPC) in the IAM to an AC value. The IAM, also containing the attendant NETINFO, is sent to the bridging and terminating nodes. After receiving the IAM, the bridging node sends an ACM to the attendant node, and the terminating node sends an ACM to the bridging node and an ANM to the attendant node indicating call connection.

Figure 5 shows a similar process to establish the second call leg between the attendant and the original calling party. The attendant node sends the IAM with the attendant's CPC and NETINFO, while the bridging node responds with an ACM and ANM.

After the original calling party answers, the attendant releases the call, and the attendant node sends an RPM Extension Complete message to the other nodes. The attendant node then sends an FAR to the bridging node requesting the call ID of the second call.

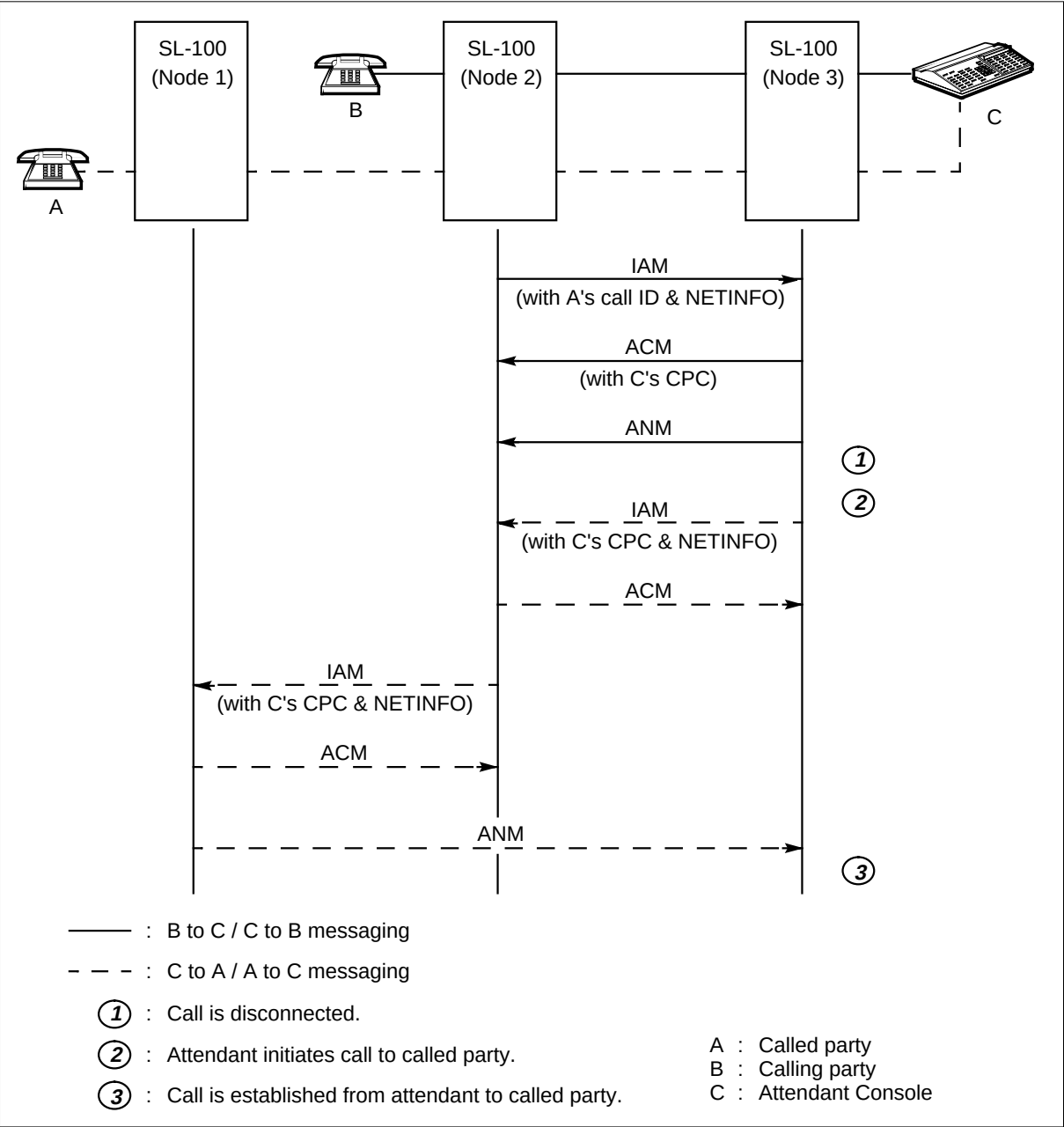
The bridging node responds to this request by sending an FAA, containing the call ID, to the attendant node. The call reference within the FAA is reformatted into an FAR, which is sent to the second call at the bridging node. This FAR requests that the call be bridged. The bridging node checks the facility indicator in the FAR to determine which function to perform. This example assumes a facility indicator of NAS_RLT_WITH_3RD_PTY. The call reference then is used to find the associated call at the bridging node. After the call is found, the system bridges the calling party to the called party.

Once the call is bridged, the bridging node sends an FAA to the attendant node to indicate FAR acceptance and call bridging. The bridging node sends an REL to release the connection, and the attendant node responds with an RLC to both call legs.

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NAS RLT table control and ISUP messaging (continued)

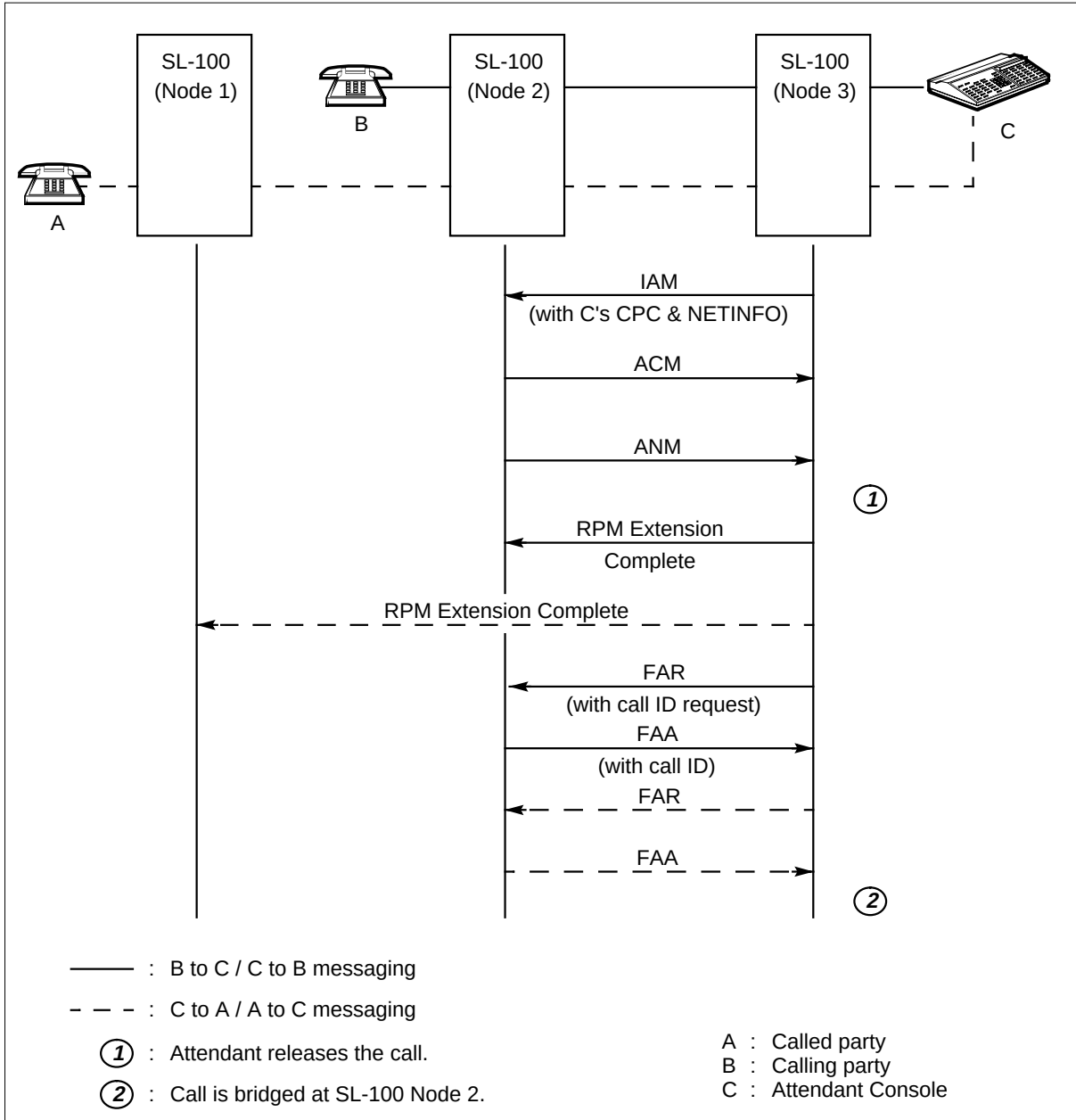
Figure 4, NAS RLT call type 3 (calling party to attendant, call disconnected, attendant to called party)



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NAS RLT table control and ISUP messaging (continued)

Figure 5, NAS RLT call type 3 (attendant extends call to original calling party and bridges call)



Hardware requirements

NAS RLT Table Control and ISUP Messaging has no hardware requirements.

AD3287**NAS RLT table control and ISUP messaging (continued)**

Limitations and restrictions

NAS RLT Table Control and ISUP Messaging has no limitations or restrictions.

Interactions

NAS RLT Table Control and ISUP Messaging has no functionality interactions.

Datafill

Table CUSTNTWK provides the ability to specify a network name with which a customer group is associated and enables the customer to assign calling features to customer groups. This table is required for systems with North American translations and IBN and NAS features.

Table CUSTNTWK also specifies that the NAS RLT feature is available for the network customer group. If the NAS RLT feature is not datafilled in table CUSTNTWK, then the system cannot support NAS RLT functionality at that node for calls associated with the attendant.

The NASOPT (Network Attendant Services Options) field in table CUSTNTWK specifies individual NAS features for a particular customer group. The NASOPT option must be datafilled as NRLT to specify that the NAS RLT function is available for that customer group. This option must be datafilled at all nodes where the NAS RLT feature could be invoked.

Service orders

NAS RLT Table Control and ISUP Messaging does not affect SERVORD.

Operational measurements

NAS RLT Table Control and ISUP Messaging does not affect operational measurements.

Logs

NAS RLT Table Control and ISUP Messaging does not add any additional logs. Refer to the Description section for feature interactions to logs.

User interface

NAS RLT Table Control and ISUP Messaging does not change the user interface.

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NAS RLT table control and ISUP messaging (end)

Billing

NAS RLT Table Control and ISUP Messaging does not affect billing.

AD3288**Remote trunk ID display at AC**

Functionality name

Remote Trunk ID Display at AC

Description

This feature provides the ability to display a remote trunk group CLLI at the Attendant Console (AC) when the AC receives a call over an IBN ISUP trunk. Some features within a network environment depend on CLLIs to function properly. These CLLIs, datafilled on a per-switch basis, have an associated alphanumeric name. However, each CLLI is assigned a number that is datafilled in the system. The system uses this number, or ID, in call processing. Because a local CLLI ID depends on the order in which it is datafilled, the CLLI ID cannot be considered unique across the network.

This feature provides a mapping of local CLLI IDs and unique network CLLI IDs defined for the network environment. Table NTWKCLLI implements this mapping by associating a CLLI with a network name that is defined in Table NETNAMES. Table NTWKCLLI also assigns this CLLI to a network CLLI ID and allows network CLLIs to be identified through a network by a NETCLLID. ISUP messaging provides the network name and network CLLI ID when nodes communicate with each other.

Hardware requirements

Remote Trunk ID Display at AC has no hardware requirements.

Limitations and restrictions

Remote Trunk ID Display at AC has no limitations or restrictions.

Interactions

Remote Trunk ID Display at AC has no functionality interactions.

Datafill

Systems within the associated network then identify remote CLLIs and associated options by datafill in Table REMCLLI. This table provides two options:

- ICI (Incoming Call Identification) — specifies that incoming calls to the attendant console with the associated remote CLLI terminate to the ICI number datafilled with this option. Once the attendant answers the call, the

AD3288

Remote trunk ID display at AC (end)

AC display shows the Table ICIDATA information associated with this ICI number. The AC key associated with this ICI code lights.

- LCLCLLI (Local CLLI) — allows a customer to override the display of local incoming trunk group CLLIs with more meaningful names.

To complete this datafill, a new option in Table TRKSGRP must be datafilled. Option REMDISP, for IBN trunk types with a C7UP signaling type, indicates that network CLLI IDs may be included in the Initial Address Message (IAM). This information is added to the IAM only when the originating agent of the call is a trunk. (The trunk group CLLI must have been datafilled in Table NTKWCLLI.)

The IAM contains a new subparameter within the NETINFO parameter. The system adds this subparameter to the IAM when the outgoing ISUP trunk has the REMDISP option datafilled and the incoming trunk group CLLI is datafilled in Table NTKWCLLI. The subparameter, when included in the IAM, contains the network ID and the associated NETCLLID.

An additional option, REMTKDSP in Table CUSTCONS, checks whether a NETCLLID has been received. If so, the system checks Table REMCLLI to determine if the call is to be terminated to a specific ICI key associated with the NETCLLID. The system also determines whether a different CLLI should be presented on the second display line on the attendant console.

Service orders

Remote Trunk ID Display at AC does not affect SERVORD.

Operational measurements

Remote Trunk ID Display at AC does not affect operational measurements.

Logs

Remote Trunk ID Display at AC does not affect logs.

User interface

Remote Trunk ID Display at AC does not change the user interface.

Billing

Remote Trunk ID Display at AC does not affect billing.

AD3366**Power Feature Enhancements and Maintenance**

Functionality name

Power Feature Enhancements and Maintenance

Description

This feature provides enhancements and maintenance support for the broadcast features developed in BCS32. This feature provides:

- calling party number parameter in the Initial Address Message (IAM).
- user-to-user information parameter to transfer the information between the originator and the terminator.
- maintenance and administrative enhancements for broadcast applications.

Calling party number parameter

The calling party number parameter identifies the calling party. It is an optional parameter in the IAM. If the incoming IAM contains this parameter, it is copied to the outgoing IAMs while building an outgoing IAM.

Transport user-to-user information

This feature defines an optional parameter, user-to-user information, to transfer the information which is only used by the originator and the terminator. This parameter is optional in the IAM. If the incoming IAM contains this parameter, it is copied to the outgoing IAMs while building an outgoing IAM. The maximum length of this parameter is 131 bytes. The length of an ISDN User Part (ISUP) message with this parameter cannot exceed what is defined by ANSI.

Maintenance support

The following are included in maintenance support:

- existing MAP level
- enhancements to trunk test position (TTP) for broadcast feature

Existing MAP level

On the existing TTP level of a MAP workstation, a user is allowed to post a specific trunk common language location identifier (CLLI) plus the member number. When posted, the status of that trunk plus the status/connection information is displayed.

There is no change made on the TTP level display if the posted trunk is not involved in the broadcast call.

AD3366

Power Feature Enhancements and Maintenance (continued)

This feature provides the broadcast indicator and a new selector of the POST command under TTP level for the broadcast feature.

Enhancements to TTP for broadcast feature

The following are the enhancements:

- the ability to post broadcast controller/input port
- the ability to post broadcast terminator/output port
- a POST command

Broadcast controller/input port If a user posts an individual trunk which is the controller of the broadcast call, the status is displayed. BC-CTRL is displayed to indicate that this circuit is a broadcast call controller.

Broadcast terminator/output port If a user posts an individual trunk which is one of the terminators of the broadcast call, the status and broadcast controller are displayed. BC-TERM and BC-CTRL are also displayed to indicate the broadcast terminator/controller.

POST command The POST command is the only change to the existing commands and functions under TTP. This feature provides a new selector, broadcast call (BC), for the broadcast feature.

When the POST command is entered with the BC selector, a trunk CLLI and member number of the controller or terminator must be provided.

An error message, Circuit not involved in BC, is displayed if the provided trunk circuit is not involved in a broadcast call. If the trunk circuit is not involved in the broadcast call, the broadcast controller and all the terminators involved in the same BC (as provided by the specified trunk circuit) are formed as a post set. The broadcast controller of the call is displayed in the control position.

The user can issue the NEXT command to get the next terminator involved in the call. The terminator information is displayed in the control position.

If the user issues the HOLD command, the information displayed in the control position is copied to the hold position. The next terminator is displayed in the control position automatically.

The maintenance commands (BSY, RTS, TST) only apply to the trunk which is posted in the control position.

AD3366**Power Feature Enhancements and Maintenance** (continued)**BRDCST command**

This feature creates a new CI command called BRDCST. A valid trunk CLLI and member number need to be provided when issuing this command. If the provided trunk circuit is not involved in a broadcast call, the error message, Circuit not involved in broadcast call, is displayed. Otherwise, a list of the CLLI and member number of the broadcast controller, and all the terminators involved in this call, are displayed. The controller is always displayed at the beginning of the list.

Maintenance messaging

Two maintenance messages are used in this feature:

- FRLS
- busy carrier/carrier failure

FRLS

A user can enter the Force Release (FRLS) command from the TTP level of any MAP workstation to force release a specific trunk circuit. When the FRLS command is issued, the maintenance sends a Reset Circuit (RSC) message to notify the other end.

Busy carrier/carrier failure

The call is released and a group reset circuit message representing all the circuits is sent to the far end when a busy carrier or carrier failure occurs.

Hardware requirements

Power Feature Enhancements and Maintenance has no hardware requirements.

Limitations and restrictions

The Power Feature Enhancements and Maintenance supports the user-to-user information parameter as an optional parameter only in the IAM.

Interactions

The following paragraphs describe the interactions between Power Feature Enhancements and Maintenance and other functionalities.

The user-to-user information parameter and the calling party number parameter are the optional parameters in the IAM. When building an outgoing IAM, if the incoming IAM contains these two parameters, they are always copied to the outgoing IAMs for every broadcast-specific output port.

AD3366

Power Feature Enhancements and Maintenance (end)

Datafill

Power Feature Enhancements and Maintenance does not affect data schema tables or office parameters.

Service orders

Power Feature Enhancements and Maintenance does not affect SERVORD.

Operational measurements

Power Feature Enhancements and Maintenance does not affect operational measurements.

Logs

Power Feature Enhancements and Maintenance does not affect logs.

User interface

This feature creates a CI command called BRDCST. A valid trunk CLLI and member number need to be provided when issuing this command. If the provided trunk circuit is not involved in a broadcast call, the error message, Circuit not involved in broadcast call, is displayed. Otherwise, a list of the CLLI and member number of the broadcast controller, and all the terminators involved in this call, are displayed. The controller is always displayed at the beginning of the list.

Broadcast Call is a new selector added to the POST command under the TTP level. The trunk CLLI and the trunk member number are required when the POST command with BC selector is issued. If the specified trunk circuit is not involved in a broadcast call, an error message is displayed. Otherwise, the controller of the broadcast is displayed in the control position. The NEXT command can be entered to display the next terminator.

Billing

Power Feature Enhancements and Maintenance does not affect billing.

AD3417**XSM system monitor maintenance interface**

Functionality name

XSM System Monitor Maintenance Interface

Release applicability

XSM System Monitor Maintenance Interface was introduced in BCS34 and applicable for release MSL03 and up.

Description

This feature provides support for the Extended System Monitor (XSM) maintenance interface for Meridian 1 Intelligent Peripheral Equipment (IPE). A generic data link interface residing in the Central Controller (CC) provides the Meridian SL-100 data link interface to the XSM.

Two existing tables, MPC and MPCLINK, datafill the data link circuits for communications with the XSMs. The following changes were made to support this feature:

- The SLLNKDEV table has been enhanced to allow the new XSM data application, XSMDATA, to use the SLLNK facility.
- Table IPEINV has been modified to allow the user to specify XSM information for a given IPE.
- A new CI command, XSMSHOW, has been created and is used to allow users to view XSM configuration information.

Table IPEINV changes

The following changes were made to table IPEINV:

- A new selector, XSMEQUIP, identifies whether or not the IPE column (IPEC) that the IPE resides in is equipped with an XSM.
- All IPEs residing in a given IPEC must have the same value datafilled for this selector.
- The LOOPID field must be filled in with a valid data link identified as datafilled in table SLLNKDEV
- The XSMID field identifies the XSM that is monitoring the IPE. The value for this field corresponds to the DIP switch setting for the XSM monitoring the IPEC where the IPE resides. Range of values for this field is 0 to 63,

AD3417

XSM system monitor maintenance interface (continued)

with 0 representing the master XSM and 1 through 63 representing slave XSMs.

- The MODULENO field specifies the address for the IPE within its IPEC. This field must correspond to the cube or shelf number in the IPENM field. Range of values for this field is 0 to 3.

XSMSHOW command

The XSMSHOW command allows a craftsman to view XSM configuration information that is datafilled in tables SLLNKDEV and IPEINV. The user can use this command to view configuration data for one XSM on a given data link, all XSMs on a given data link, or all XSMs that are datafilled.

XSM unsolicited fault reports

When a master XSM detects a fault in the IPEC that it monitors, or receives a fault message from one of its slaves during polling, a fault message is sent to the CC. The XSM SLLNK interface receives the message from the RS232-C port and routes the messages to the CC for processing. If the message reports a failure for one IPE with an IPEC, that IPE is queried using conventional CC-PM messaging. If the IPE responds to the query message, a PM log is generated and the state of the IPE is changed to In-service Trouble (ISTb).

The following are new ISTb conditions. They are displayed using the QUERYPM FLT command at the IPE level of the MAP display when the IPE that is in ISTb state is posted:

- circuit breaker tripped
- power supply fault
- excessive column temperature
- pedestal fan unit fault
- top can fan unit sensor fault

If the IPE fails to respond, the IPE is marked System Busy (SysB) and PM logs generate to report the failure. If the message from the XSM reports a failure for all IPEs in an IPEC, each IPE is queried for its status. If a master XSM reports that one of its slaves is not reporting, an XSM log reporting the failure of the slave generates. Also, any XSM-related ISTb conditions for all IPEs monitored by the non-reporting slaves are cleared.

XSM fault cleared reports

When a master or slave XSM detects that a previously reported fault condition is cleared, a corresponding status change report is sent to the CC. If the cleared

AD3417**XSM system monitor maintenance interface** (continued)

fault corresponds to an IPE within an IPEC and the IPE is currently in ISTb state, any ISTb conditions related to the fault are cleared. If the IPE is currently in SysB state, the system attempts to return the unit to service. Most attempts to return the IPE to service are unsuccessful because most serious XSM-related faults cause power to be turned off for the IPE. This results in the loss of the IPE's software load. If this happens, the craftsman must reload each unit and return it to service. If the message from the XSM reports a cleared fault for an entire IPEC, each IPE is handled as if the fault were cleared for each IPE individually.

XSM periodic audits

During each master XSM polling routine, each of the slaves reports its current status. If faults are detected, the master XSM reports the problem. If no faults exist, an XSM does not send any messages to the CC. The CC therefore has no way of knowing whether or not everything is working properly and an XSM has nothing to report, or whether communication has been lost between the CC and the XSM. For this reason, as part of the regular PM audit cycle, each master XSM datafilled in the MSL-100 reports the status of itself and its slaves. If there is no response to the status request, an XSM log is generated. This log states that the master XSM reporting on that link is out of service. If the master XSM responds and reports that one or more of its slaves is not responding, an XSM log pertaining to each failed slave is generated. If the master XSM reports failures within the IPEC it monitors, or if any of its slaves report failures, PM logs identify the failures.

Because the status of each IPE is already being audited as part of the same PM audit cycle, no query messages are sent to the IPEs in response to failures in the XSM audit portion.

Hardware requirements

The following are the hardware requirements for this feature:

- The XSM System Monitor card (NTD8D22AC) is required.
- The Multi-Protocol Controller card (NT1X89AA) is required to enable the MSL-100 to communicate with XSMs.
- Two eight-position DIP switches on the XSM are used to indicate the system configuration, XSM function (master/slave), and XSM identifier (0 to 63).
- Cables are required to establish the link between the XSM and the MPC, to serially connect the slave XSMs with their master, and to wire the IPE modules within an IPEC to the XSM.

AD3417

XSM system monitor maintenance interface (continued)

Limitations and restrictions

The following limitations and restrictions apply to XSM System Monitor Maintenance Interface:

- The MPC (Multi-Protocol Converter) 1X89 card is used as the physical interface between XSMs and an IOC. One MPC card supports two RS232-C data links. Therefore, only two master XSMs can be supported on one MPC card.
- Table SLLNKDEV allows the craftsman to define MPC ports for XSM data applications. Up to 64 data links can be defined in table SLLNKDEV. Therefore, no more than 64 master XSMs can be defined in a single MSL-100.
- If the data link between the MSL-100 software and a master XSM is unavailable, it is impossible for the CC to determine any status information or fault reports from that XSM and any of its slaves.
- No other XSM fault reports other than those defined by this document are supported for XSMs in an MSL-100 environment.
- Slave XSMs under the control of a given master XSM must be numbered sequentially (DIP switch setting), and failure to do so will result in incorrect fault reports being generated for any slave XSM missing from the sequence. For example, if slave XSMs were numbered 1,3,4, and 8, the master XSM would report that slaves 2,5,6, and 7 were not reporting.
- If additional slaves are added to the "daisy chain" with a previously configured and working master XSM, the DIP switch setting for the master XSM must be changed to reflect the new number of slave XSMs under its control.

Interactions

This is an optional feature that, in conjunction with feature AD3418, XSM System Monitor SLLNK Interface, provides XSM capability for IPEs in the MSL-100 environment. This feature interacts with existing CC PM maintenance software and has the potential to invoke IPE PM maintenance operations and IPE state changes. With this feature, IPE power and temperature related faults can be reported and acted upon more quickly than with conventional CC PM maintenance audits and reporting facilities.

AD3417**XSM system monitor maintenance interface** (continued)**Datafill**

Existing table IPEINV was modified to include XSM configuration information. The following lists the new fields in table IPEINV:

New fields in table IPEINV

Field name	Range of values	Description
XSMEQUIP	Y or N	This field specifies whether the IPE is monitored by an XSM.
LOOPID	1 to 16 characters	This field specifies which data link is datafilled in table SLLNKDEV
XSMID	0 to 63	This field specifies the number of the XSM that is responsible for monitoring the IPE. This value must correspond to the DIP switch setting for the XSM in the IPEC column pedestal.
MODULEID	0 to 63	This field specifies the address of the IPE within its IPEC column. This value should correspond with the IPE's position in its IPEC. It should also correspond with the shelf number in the key for this tuple.

If XSMs require datafill, table SLLNKDEV must be datafilled with a valid XSM data link before datafilling table IPEINV.

Service Orders

XSM System Monitor Maintenance Interface does not use SERVORD.

Operational measurements

Existing IPE Operational Measurements in groups PM and PMTYP are pegged based on the state or state transitions of IPEs. Although the XSM usually reports IPE failures more quickly than conventional PM error reporting methods, the functionality of existing IPE OMs is not changed.

Logs

This feature increases the possible ways in which an IPE fault or failure can be detected and subsequently logged. Two new log reports, XSM103 and XSM104 have been created. The XSM 103 log is generated when an XSM is determined to be out of service. For master XSMs, this occurs during the

AD3417

XSM system monitor maintenance interface (end)

regular PM audit cycle when no response has been received to a status inquiry message. For slave XSMs, it occurs when the master reports a failure for the slave. The XSM104 log is generated when an XSM returns to service after a fault condition is reported.

User interface

The following changes have been made to the man-machine interface for this feature:

- The IPE PM MAP level has been enhanced to display SysB or ISTb conditions using the QUERYPM FLT command for IPE hardware faults detected and reported by XSMs.
- A new command, XSMSHOW has been created to allow a craftsperson to view XSM configuration information.
- A nonresident CI command XSMDEBUG was created to allow testing of XSM CC software without the need for a physical connection between the MPC and an XSM.

Billing

XSM System Monitor Maintenance Interface does not affect billing.

AD3418**XSM system monitor SLLNK interface**

Functionality name

XSM System Monitor SLLNK Interface

Release applicability

MSL03 and up

XSM System Monitor SLLNK Interface was introduced in BCS34.

Description

This feature provides the data interface software on the MSL-100 Central Control (CC) to communicate with up to 64 master Extended System Monitor (XSM) cards. The software interacts with the CC Peripheral Module (PM) maintenance task to relay system status messages to and from the XSM. This feature enables the craftsperson to do the following:

- monitor the IPE (Intelligent Peripheral Equipment) system status using dedicated RS232-C links, and be alerted when a status change occurs
- organize the IPE modes into column/module and master/slave configurations for system status monitoring
- perform system configuration changes and maintenance actions by using the DMS-100 mechanism
- improve the system availability by having an autonomous power monitoring and control system that provides up-to-the-second fault detection data

Data link interface

SLLNK, a generic data link interface that resides in the CC, provides the MSL-100 data link interface to the XSM. The Multi-Protocol Controller (MPC) 1X89AA card connects the RS232-C link from the XSM to the Input/Output Controller (IOC) on the CC. The MPC is a software-downloadable I/O device that resides on the IOC shelf. It supports two serial ports capable of RS232 synchronous/asynchronous transmission.

Two existing tables, MPC and MPCLINK are used to datafill the data link circuits for communicating with the XSMs. Table SLLNKDEV was enhanced to allow the new XSM data application, XSMDATA, to use the SLLNK facility.

XSM configuration

The XSM circuit pack is located on the IPE column pedestal. Each IPE column (IPEC) consists of a stack of up to four IPE modules. These modules

AD3418**XSM system monitor SLLNK interface** (continued)

are numbered 0 to 3 from bottom to top. IPE models are numbered according to their physical locations in an IPEC. One master XSM is capable of supporting up to 64 columns, which means that one master XSM can potentially support up to 256 IPE modules.

The XSM ID (XSMID) is assigned using DIP switches on the XSMs from 0 to 63. Number 0 is always associated with the master XSM, which the slaves are numbered from 1 to 63. A RS232-C link that is connected to a master XSM is called a loop. There can be a number of master XSMs configured, and there can be an equal number of loops for the XSMs. The existing XSM configuration setup and changes are done through the existing IPEINV table. Table IPEINV was modified to allow the user to specify the optional XSM information. The XSM information given to an IPE tuple in the IPEINV table is in the format of loop ID, XSMID and module number, which indicates exactly how an IPE node is configured.

A new CI command, XSMSHOW enables the craftsperson to view the current XSM configurations. The configurations can be viewed by specifying an XSM loop ID or a pair key consisting of an XSM loop and XSMID. The XSM loop displays all the XSMs and IPEs associated with the specified XSM loop. The XSMID displays all the IPEs associated with the specified XSM loop and XSMID pair.

XSM maintenance interface

The XSM maintenance provides the need to react to the fault status reported by the XSMs, to alert the craftsperson so that appropriate maintenance action can be taken, or to query the XSM for system fault status. When the XSM detects a fault, it is received by the CC through the RS232-C link. The IPE maintenance software is notified accordingly. Maintenance actions are taken and logs are generated to alert the craftsperson.

For IPE configurations that are equipped with the XSMs but that do not have RS232-C connections to the IOCs, DMS-100 provides an alarm system that consists of hardware devices and software modules for detecting and reporting equipment faults by visual and audible alarms. The hardware comprises various circuit packs that provide signal scan points and signal distribution points. Signal scan points determine the state of a variety of equipment. Signal distribution points activate and deactivate the external relay-controlled equipment.

The alarm system software serves as an interface between the alarm hardware and the external alarm's user interface. The external alarm's system user interface includes the MAP level alarm's status display and commands to

AD3418**XSM system monitor SLLNK interface** (continued)

display, query, or control the alarm scan and distribution points. The alarm scan points and distribution points are defined through table control in tables ALMSCGRP, ALMSC, ALMSDGRP, and ALMSD.

Hardware requirements

The XSM System Monitor card (NT8D22AC) is required. The Multi-Protocol controller card (NT1X89AA) is required to enable the MSL-100 software to communicate with the XSM. Cables are required to establish the links between an XSM and an MPC, and between an IPE bulkhead and the IOC. Other cables are required to serially connect the slave XSMs with the master and to wire the IPE modules within a column to the XSM.

Limitations and restrictions

The following limitations and restrictions apply to XSM System Monitor SLLNK Interface:

- The MPC 1X8AA card is used as the physical interface between the XSM and the IOC. One MPC card supports two XSM RS232-C loops.
- Table SLLNKDEV allows users to define the MPC ports for XSM data applications. The maximum number of data links that can be defined in table SLLNKDEV is 64, so the maximum number of XSM loops that can be configured is restricted to 64 also. The XSM application co-exists with the SMDI applications, but competes with SMDI for available SLLNK devices.
- A single MPC card cannot support more than one protocol. No more than two physical links can be used per PC card.
- The XSM configurations are dictated by the way the master XSM communicates with its slaves and the way it reports the fault status.

Interactions

This feature, in conjunction with feature AD3417, XSM System Monitor Maintenance Interface, provides the XSM functionality to the MSL-100 IPE configuration. It interacts with the MPC/SLLNK data link software and XSM System Monitor Maintenance Interface software.

Datafill

To enable the XSM data link interface to use the SLLINK services, the XFERS field of table SLLNKDEV was changed to allow a new application, XSMDATA. This change enables users to datafill a SLLNK device for XSM data applications. For the XSM application, the datafill sequence is table MPC, table MPCLINK, and table SLLNKDEV.

AD3418

XSM system monitor SLLNK interface (end)

Service Orders

XSM System Monitor SLLNK Interface does not use SERVORD.

Operational measurements

Existing OMs pertaining to the MPC and SLLNK are used as they are currently implemented. There are no new OMs for the XSM SLLNK interface application. The MPC/SLLNK related OMs include OM groups MPCBASE, MPCLINK2, MPCLINK3, SLLNKINC, and SLLNK.

Logs

Logs pertaining to the MPC and SLLNK systems are used. The following three new XSM data log reports were created for this feature:

- XSM100—generates inquiry messages to the XSM when the data link is down
- XSM101—generates for each SLLNK data link the first time an XSM status inquiry message is successfully queued after the XSM100 condition is cleared
- XSM102—generates when an incoming message is discarded because there is no more room in the queue

User interface

The existing CI increment LNKUTIL allows the users to manipulate the way SLLNK data link is used. Only the QUERY command is valid for MPC links. Command restrictions are unchanged. MPS links are automatically connected and started when datafilled in table SLLNKDEV and returned to service at the MAP display level. The links are automatically stopped when they are put into busy mode at the MAP display level.

A new CI command, XSMSHOW, is provided that allows the craftsperson to view the current XSM configurations.

Billing

XSM System Monitor SLLNK Interface does not affect billing.

AD3419**Broadcast loading for IPEs and DLMs****Functionality name**

Broadcast Loading for IPEs and DLMs

Release applicability

MSL03 and up

Broadcast Loading for IPEs and DLMs was introduced in BCS34.

Description

This feature provides for rapid Intelligent Peripheral Equipment (IPE) and Digital Line Module (DLM) peripheral recovery following a major crisis, such as a complete PBX (Private Branch Exchange) power loss. This feature includes enhancements to the maintenance operations available to both the DLM and the IPE level of the MAP display. Previously, maintenance operations issued from a MAP display could only be executed on a single Peripheral Module (PM) at a time. This feature allows a craftsperson to execute a single command to perform maintenance operations on many PMs of the same type and set.

The following operations are supported for concurrent execution on a set of DLMs or IPEs.

- Busy (BSY)
- Return to Service (RTS)
- Offline (Offl)
- Loading (LoadPM)

These enhancements are available to all DLM- or IPE-based peripheral modules. The enhanced operations only function on a group of DLMs or a group of IPEs of the same PM type. By invoking a command with the ALL parameter, the maintenance operation executes on each PM in the post set.

For each DLM or IPE that is taken out of service, a warning prompt asks for confirmation of the maintenance operation on that PM. If the response to the prompt is no, that particular DLM or IPE is taken out of the group of DLMs or IPEs on which the operation is being performed. Execution of the operation continues on the DLMs or IPEs that are confirmed.

A reply to every maintenance request is provided. At the end of the operation, a summary is provided.

AD3419

Broadcast loading for IPEs and DLMS (continued)

Hardware requirements

Broadcast Loading for IPEs and DLMS has no hardware requirements.

Limitations and restrictions

This feature is used only to extend the broadcast loading of LCMs to include both DLMS and IPEs.

Interactions

This feature interacts with the following:

- PM MAP level software
- PM maintenance software
- Feature AL0481, IPML PM Load MTC Utilities
- Feature AL0480, Enhanced PM MAP Level
- Feature AM0037, IPE PM Maintenance—Phase I
- Feature AD0069, DLM Maintenance Enhancements

Datafill

Broadcast Loading for IPEs and DLMS does not affect datafill.

Service Orders

Broadcast Loading for IPEs and DLMS does not use SERVORD.

Operational measurements

Broadcast Loading for IPEs and DLMS does not affect operational measurements.

Logs

Broadcast Loading for IPEs and DLMS does not affect Logs.

User interface

This feature provides the ability to execute a maintenance operation on a set of DLMS by entering a single command. For the user to indicate that the operation is to be executed on a set of DLMS, rather than just the DLM displayed on the MAP display, the ALL parameter has been added. The Bsy, RTS, Offl, and LoadPM commands interact with the ALL parameter. Only those DLMS posted on the MAP display are in the scope of the ALL parameter.

AD3419

Broadcast loading for IPEs and DLMs (end)

Before executing a maintenance operation with the ALL parameter, a confirmation of the operation is required. A prompt displays to ensure that the user knows the number of DLMs that the operation is executed on.

Billing

Broadcast Loading for IPEs and DLMs does not affect billing.

AD3468

Replace Dialed Digits II

Functionality name

Replace Dialed Digits II

Description

The Network Services System (NSS) Replace Dialed Digits (RDD) feature allows a call to route to a number other than the actual dialed digits. The feature replaces a call's dialed digits and network class of service (NCOS) with new digits and a new NCOS using the RDD database. The new digits determine the call destination. The RDD database is a new table REPLDATA.

This feature provides the option of accessing the RDD database in the DMS switch, in-switch, or remotely through a NSS database control point (DBCP). Network service code (NSC) call translations initiate accessing the in-switch or remote RDD database.

Remote RDD service is provided on a service switching point (SSP) that communicates with the RDD database using signaling system 7 (SS7). An SSP is a node in the SS7 network that launches queries to a database located at a DBCP.

This feature modifies the N00 dialing capabilities on an NSS by allowing an N00 number to be replaced using the in-switch or remote RDD database.

Hardware requirements

The Replace Dialed Digits II feature has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Replace Dialed Digits II:

- NSCODE REPLDIGS must be datafilled in table NSCDEFS with at least the REPLDIGS option, REPLACE.
- The REPLACE and COSMAP options are applicable only to the REPLDIGS NSCODE.
- All RDD numbers using the RDD database must be datafilled in table REPLDATA or the call routes to the failure route assigned in table NSCDEFS.
- An 800 universal access number must be datafilled in table DNROUTE as a Meridian off net access (MONA) directory number (DN) or the call blocks and the caller receives vacant code treatment (VACT).

AD3468**Replace Dialed Digits II** (continued)

- The numbering plan area must be provided in the automatic number identification (ANI) for NSS Feature Group D (FGD) 400/800 INWATS calls that require ANI delivery or the call blocks and the caller receives partial dial (PDIL) treatment.
- The ten-digit ANI must be provided for NSS FGD 900 calls that require ANI delivery or the call blocks and the caller receives partial dial treatment.
- ANI screening is performed only for NSS FGD 700 calls. 700 calls that require ANI delivery must pass ANI screening or the call blocks and the caller receives ANI database failure treatment. The discussion of ANI in this document applies only to N00 calls on a NSS FGD trunk, with NSSFGD datafilled in table TRKGRP. The discussion of ANI in this document excludes calls on a SS7 FGD trunk.
- On non-FGD trunks, N00 calls will not block for failing ANI requirements.
- The TIMEOUT field in table NSCDEFS is datafilled with a value less than 600.
- Silent tone is given during the RDD DBCP response wait period. When a response timeout expires, the call is sent to the failure route.
- Since the value in the TIMEOUT field in table NSCDEFS determines the response timeout, the caller can receive silent tone for the length of the timeout value.
- The only field in the SMDR #DB record supported by the RDD feature is the MSN_ACCESS_DN for non-NSS calls.
- Each integrated business network (IBN) feature imposes its own intragroup requirements. The “intragroupness” of a RDD call is evaluated on the basis of the translation of the dialed number rather than the replaced digits.
- If less than ten dialed digits route to the RDD feature, the call is sent to treatment and an NSS107 log generates.

Interactions

The following paragraphs describe the interactions between the Replace Dialed Digits II feature and other functionalities.

An 800 universal access number datafills as a MONA DN. RDD calls can dial as the destination digits of a MONA call.

RDD calls can dial as the destination digits of a re-originated call.

AD3468

Replace Dialed Digits II (continued)

RDD calls can dial as the destination digits of a direct inward system access (DISA) call.

RDD calls can dial as the destination digits after entering an authorization or account code feature access code. RDD calls can route to authorization or account code feature access codes.

RDD calls can route to some IBN features and some features can interact by dialing a RDD call. In all cases the intragroup requirements imposed by each feature must be met. The intragroupness of an RDD call is evaluated on the basis of the translation of the dialed number rather than the replaced digits.

RDD replaced digits can route to the following features:

- ACD
- UCD
- MADN
- Meet-me Conference
- AUTH
- ACCT

RDD calls can dial from the following features:

- CNF
- CXR
- 3WC/CT

The following features work with RDD calls:

- OHQ
- VFGs
- LNR

Datafill

Table REPLDATA is added and changes are made to tables HNPACONT and NSCDEFS.

Service orders

The Replace Dialed Digits II feature does not affect SERVORD.

AD3468**Replace Dialed Digits II (end)**

Operational measurements

The Replace Dialed Digits II feature does not affect operational measurements.

Logs

The Replace Dialed Digits II feature does not affect logs.

User interface

The Replace Dialed Digits II feature does not change the user interface.

Billing

For station message detail recording (SMDR) billing on NSS and non-NSS calls, the RDD feature uses the SMDR NSS record (#DB) to display the dialed digits in the SMDR record. The dialed digits display in the MSN_ACCESS_DN field. The other fields in the #DB record are not applicable for the RDD feature for non-NSS calls. The CALLED_DR field in the #D1 record, records the replaced digits. If the dialed digits are not replaced, the CALLED_DR field contains the nils, #A's.

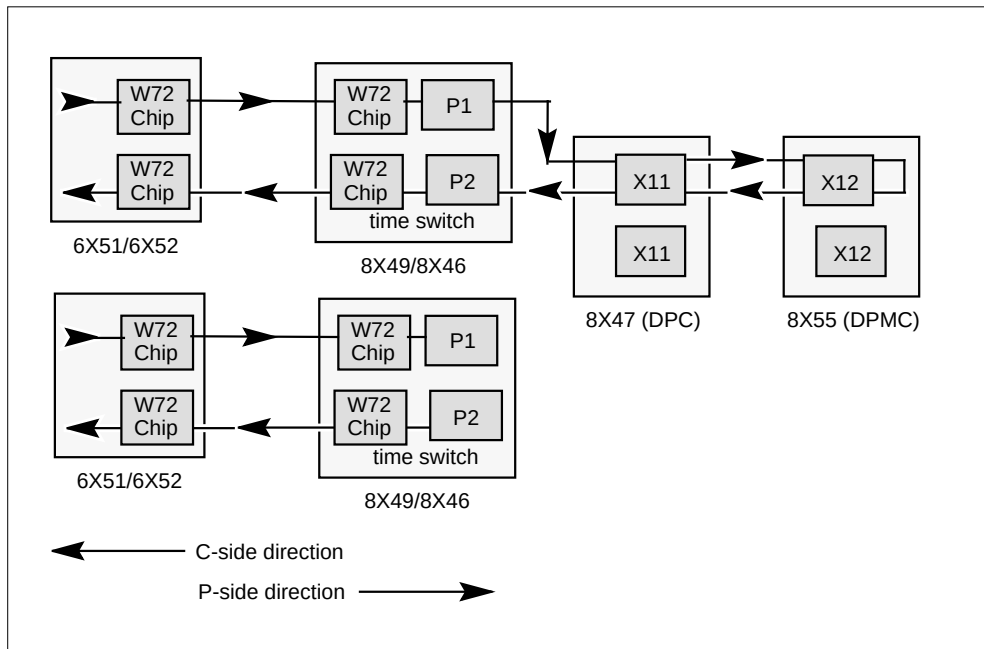
For variable call detail recording (VCDR) billing, the DIALED_DR field records the replaced digits. The dialed digits are not recorded unless the digits cannot be replaced and the call routes to the fail route or to treatment.

AD3493**Enhance DLM PM diagnostics****Functionality name**

Enhance DLM PM Diagnostics

Description

This feature enhances the current Peripheral Module (PM) diagnostics for the Digital Line Module (DLM) to test and verify Pulse Code Modulation (PCM) and signaling for the P-side of the 8X46 board. Previous DLM PM diagnostics performed a loop test that tested the W72 chips on the P-side of the 6X52 board and the C-side of the 8X49 board. However, these diagnostics were not able to detect W72 chip faults or do loop tests on the P-side of the 8X46 board. The enhanced PM diagnostics perform a series of line diagnostics (W72 loop tests) that allow testing of these chips. This feature adds W7 loop testing through the X11 chip on the 8X47 boards and the X12 chip on the 8X55 boards to the existing capabilities. The following figure illustrates the enhanced PM diagnostic capability.

Enhanced PM diagnostic capability

The W72 chip labeled “P1” serves as a parallel-to-serial converter and has 10 pins on each side. On the C-side, eight of the pins receive a parallel stream of PCM (Pulse Code Modulation). The ninth pin is used for voice and data signaling and the tenth pin is grounded. On the P-side, each one of the 10 pins

AD3493**Enhance DLM PM diagnostics** (continued)

is dedicated to a particular 8X47 board. These pins on the P-side of the W72 chips are serial streams of PCM and signaling.

The W72 chip labeled “P2” is the opposite, serving as a serial-to-parallel converter. The P-side pins receive PCM and signaling information from the 8X47 boards. The W72 chip processes the information and sends it to the C-side as eight bits of PCM and one signaling bit for voice and data.

In-service testing

The W72 chips on the P-side of the 8X46 board are tested using in-service tests. To fully test the W72 chips, each DPC (Digital Port Card) associated with a W72 chip must be tested. When testing the DPC, the software specifies a particular voice or data LEN (Line Equipment Number). When testing this LEN, there cannot be any calls on either the voice or data LEN. If a LEN is unequipped and in the HASU (Hardware Assigned, Software Unassigned) state, testing on that LEN will not cause any interruption of service. If the LEN is datafilled and is available for use, then testing on that LEN would prevent the voice and data line from being used during the test, which would cause interruption of service.

Because the PM audit runs during the day, only HASU LENs are used when performing the W72 tests. However, for the REX test, both HASU LENs and working LENs are used to test the W72 chips. The REX test can use working LENs because it is usually scheduled for off-hour testing.

The DPMC (Digital Port Maintenance Card) is used to verify PCM and voice-data signaling for the W7 chip and the DPC. If testing passes once, all ten of the C-side W72 pins are verified, but only one of the ten P-side pins is verified. Each DLM unit has five DPCs dedicated to it. Each of these five DPCs is dedicated to one pin on the P-side of the W72 chip. The five remaining pins of the W72 chip are used to communicate with the five DPCs of the mate unit. When the DLM unit is in service, it can communicate with each of its five dedicated DPCs. If the other unit is also in service, it cannot communicate with the DPCs of that unit. If the other DLM unit is out of service, this unit can communicate with the other DPCs. To verify the P-side pins, the PCM and voice-data signaling tests are repeated for each of the five DPCs associated with this unit. Only five of the ten P-side pins on a unit can be tested when the other unit is in service.

Testing with both units out of service

When both units of the DLM are out of service, the P-side W72 chips cannot be tested. Since the DLM is out of service, the 8X46 boards cannot

AD3493

Enhance DLM PM diagnostics (continued)

communicate with the 8X47 boards. For this reason, the P-side chips on the 8X46 board cannot be tested.

PM Audit Testing

As part of the in-service PM audit, the PCM and voice-data signaling are tested using the the DPMC. There must be at least one HASU LEN on a DLM unit. During audit testing, the LENs on the X11 chips are tested on each DPC. When testing is completed for each DPC on the unit, the number of port cards that passed and the number that failed the W72 test are counted. If any of the DPCs fail, the problem is assumed to be with the 8X46 card. Units that fail are put in ISTB (In Service Trouble) status.

Out of service port card testing

After a DPC has been put in ISTB state for possible PCM or signaling failure, the DPC is tested to verify the failure. PCM and signaling tests verify the path through the W72 chips of the 8X46 board to the DPC. If one LEN is found to pass the tests, the fault is cleared for that card. If no LENs pass, the fault is not cleared.

Off-hour PM audit (REX) testing

REX testing is similar to PM audit testing. However, this procedure uses fully datafilled LENs instead of HASU LENs unless no datafilled LENs are available. If there are no datafilled or HASU LENs, no W72 testing is performed. However, if only one LEN is datafilled for a DPC, it is still possible to perform testing for that DPC during the off-hour PM audit.

The software tests the P-side 8X46 board W72 chips by seizing the voice and data LENs of idle IVD (Integrated Voice and Data) sets and tests the PCM and voice channel signaling using the DPMC. If PCM and signaling testing pass once, each of the 10 C-side W72 pins are verified, but only one of the ten P-side pins is verified. This test is repeated until all ten of the P-side pins are tested. In there is a failure, another LEN on the same DPC, but a different X11 chip, is tested. If this test fails, the software determines that either the 8X47 or 8X46 board has failed. The software then stores the information about the DPCs that failed. This information is used for further testing.

After out-of-service testing, the unit is returned to service and the remaining in-service tests are performed. When these have passed, the mate unit is tested. After the W72 chips are tested for both units, the results are compared. If the same 8X47 board failed the test from both 8X46 boards, that 8X47 board is set to SYSB status. For each 8X47 board that passes for one 8X46 but fails for the other 8X46, the unit pin failure count increases by one. The unit with the largest pin failure count is set to SYSB status, giving the 8X46 as the reason.

AD3493**Enhance DLM PM diagnostics** (continued)

This puts the other unit into takeover mode so that service to that 8X47 board is not lost. If both units have failures, a PM 181 log is generated. This log indicates that the 8X46 should be replaced.

Hardware requirements

A DPMC (8X55) board is required for this feature. It must be datafilled in table DLMINV, and the DPMC must be installed and working. If the DLM is not equipped with a DPMC, the additional tests implemented by this feature cannot verify the P-side W72 chips on the 8X46 board. In addition, for these new tests to fully test the W72 chips on the P-side of the 8X46 board of a given DLM, all DPCs must be installed for that DLM.

Limitations and restrictions

The following limitations and restrictions apply to Enhance DLM PM Diagnostics:

- Because there is no hardware on the 8X46 board to perform loop tests for the P-side W72 chips, LENSs must be seized in order to verify the W72 chips.
- W72 testing is not executed unless REX testing is enabled for that particular DLM.
- REX testing should be scheduled for off-hours. If REX tests are run during peak hours, performance degradation should be expected.
- If no HASU LENSs are available for the W72 testing, no W72 testing is performed in the standard PM audit.
- If no datafilled LENSs are available for testing during REX testing, HASU LENSs are used. If there are no HASU LENSs, no W72 testing is performed.

Interactions

REX testing for the DLM is altered to execute the tests. These tests do not require additional action by the user.

Datafill

Enhance DLM PM Diagnostics does not affect data schema tables or office parameters.

Service Orders

Enhance DLM PM Diagnostics does not affect SERVORD.

AD3493

Enhance DLM PM diagnostics (end)

Operational measurements

Enhance DLM PM Diagnostics does not affect operational measurements.

Logs

Enhance DLM PM Diagnostics does not affect logs.

User interface

When a QUERYPM FLT is performed when a DLM is posted at the PM level of the MAP workstation, a new response can be given.

Billing

Enhance DLM PM Diagnostics does not affect billing.

AD3513**Layer 2 OMs for D-Channel Backup****Functionality name**

Layer 2 OMs for D-Channel Backup

Description

This feature adds the capability for DTCI/LTCI/PDTCi PRA backup D-channel's layer 2 performance monitoring for feature AD2606, ISDN DTC Robustness PRADCHL2 OM group.

The Integrated Services Digital Network (ISDN) digital trunk controller (DTCI), ISDN line trunk controller (LTCI), and ISDN PCM30 digital trunk controller (PDTCi) is a new version of DTC/LTC/PDTC with the additional capabilities to support ISDN primary rate interface (PRI). DTCI/LTCI/PDTCi uses the ISDN Signaling Processor (ISP) to provide the D-channel signaling for all the PRI interfaces terminating on it. The OM group, PRADCHL2, monitors the performance of the PRI D-channels in DTCIs/LTCIs/PDTCis. An enhancement of the OM group, PRADCHL2, to include the performance monitoring for backup D-channel was necessary because backup D-channel was released in BCS31.

There are no new OM registers introduced in this feature. The registers used are the same as defined in feature AD2606, ISDN DTC Robustness. For more information, refer to this feature description.

Before the backup D-channel was introduced, a user could check a D-channel's layer 2 performance by entering the command OMSHOW PRADCHL2 followed by the common language location indicator (CLLI) name of that trunk group.

When backup D-channel was introduced in BCS31, CLLI could not be used as a key to index into the PRADCHL2 table to get the performance data because both the primary D-channel and backup D-channel have the same CLLI. If CLLI is used as a key, then a user cannot determine which D-channel's data to review.

A key is defined so that the user can use the key to index into the PRADCHL2 table to review the layer 2 performance. To find the key, the user uses a MAP workstation at the CI level to enter the following commands:

MAPCI;MTC;TRKS;TTP;PRADCH;POST CD xxxxxxxx

AD3513

Layer 2 OMs for D-Channel Backup (continued)

where:

xxxxxxx is the CLLI name of the trunk the user wants to review.

The MAP workstation displays the following:

CKT TYPE	PM NO.	COM LANG	STA
2W IS IS DTCT 10 5 24 xxxxxxxx			D1 INS
DTCT 10 7 24 xxxxxxxx			D2 STB

The user enters the following command to check either the primary D-channel or the backup D-channel's layer 2 performance:

OMSHOW PRADCHL2 ACTIVE DTCT0100524

where:

DTCT0100524 is the key for the primary D-channel of CLLI xxxxxxxx which corresponds to this specific D-channel's circuit location.

The first four characters are DTCT, which indicates that this circuit is on a DTCT.

The next three characters, 010, indicate the DTCT number is 10. Since the DTCT number can be three digits, put a 0 in front if the DTCT number is two digits (010 is 10).

The third part of the key, 05, is the span number of the specific primary D-channel. Since the span number can have two digits, from zero to 19, put a 0 in the front if the span number is a single digit (05 is 5).

The fourth part of the key, 24, corresponds to the time slot in the span of 05. The time slot can be a single digit, so put a 0 in front (if time slot is 2, then enter 02).

Hardware requirements

Layer 2 OMs for D-Channel Backup has no hardware requirements.

AD3513**Layer 2 OMs for D-Channel Backup (end)**

Limitations and restrictions

The following limitations and restrictions apply to Layer 2 OMs for D-Channel Backup:

- supports DMS-based PRI trunks only
- does not support backup D-channel on PDTCi

Interactions

Layer 2 OMs for D-Channel Backup has no functionality interactions.

Datafill

Layer 2 OMs for D-Channel Backup does not affect data schema tables or office parameters.

Service orders

Layer 2 OMs for D-Channel Backup does not affect SERVORD.

Operational measurements

The Operational Measurements group PRADCHL2 is modified to contain the performance monitoring for the PRI backup D-channels as follows:

- PRI D-channel layer 2 OM group
- PRI backup D-channel if datafilled (PDTCi not supported)
- pegged on a per D-channel basis
- The registers are the same as defined in feature AD2606, ISDN DTC Robustness.

Logs

Layer 2 OMs for D-Channel Backup does not affect logs.

User interface

Layer 2 OMs for D-Channel Backup does not change the user interface.

Billing

Layer 2 OMs for D-Channel Backup does not affect billing.

AD3879

Power—Nx64 wideband optionality

Functionality name

Power—Nx64 Wideband Optionality

Description

This feature provides an enhancement to the Nx64 wideband call processing capability. This chapter provides information only for those enhancements.

Currently, wideband calls provide the capability to use either 2, 6, or 24 64-kbps channels in a single call ($N = 2, 6, \text{ or } 24$). This feature enhancement allows 2 to 24 64-kbps channels ($N = 2\text{-}24$) in a single call. Each channel is a DS0, and each channel associated with the wideband call must be on the same DS1. With this feature, a single DS1 can contain up to 24 DS0 channels for a maximum 24 x 64 kbps wideband call.

Wideband introduction

Wideband calls consist of a specific number (indicated by the variable N) of 64 kilobits/second (kbps) channels within a single call. Wideband calls are also known as Nx64 wideband calls, where N equals 2, 6, or 24. This feature package implements Nx64 wideband calls over Integrated Business Network (IBN) ISDN User Part (ISUP) trunks on an MSL-100 switched network. (This feature only supports IBN ISUP trunk to IBN ISUP trunk connections.) One set of ISUP messages, instead of separate messages for each channel, sets up the call connections (2, 6, or 24 connections).

Each DS0 channel resides on the same DS1 link. A single DS1 contains up to 24 DS0s for a maximum 24 x 64-kbps wideband call. Different arrangements of the DS0s within a trunk group can be specified. Outgoing trunk groups can use bounded contiguous DS0s.

Bounded DS0s means that specific channels must be used depending on the number of connections. Outgoing trunks can also use noncontiguous DS0s.

- $N=2$ (bounded)—The DS0 used must be either channels 1-2, 3-4, 5-6, etc. through 23-24.
- $N=6$ (bounded)—The DS0 used must be either channels 1-6, 7-12, 13-18, or 19-24.

Noncontiguous DS0s should be used for wideband calls using the interswitch network. This configuration helps to obtain maximum use of the bandwidth. However, for Customer Premise Equipment (CPE) interfaces, bounded contiguous DS0s should be used for wideband calls. (This configuration follows existing ANSI standards.)

AD3879**Power—Nx64 wideband optionality** (continued)**Wideband call processing**

Incoming calls to the system arrive from the ISUP network or from Customer Premise Equipment (CPE). ISUP messaging is performed on the CCS7 signaling link that is connected to the Link Peripheral Processor (LPP). The ISUP trunks connect to the Digital Trunk Controller (DTC). The outgoing call then connects to the ISUP network or CPE. This feature provides for switching incoming ISUP trunks to the outgoing ISUP trunks as the wideband call needs.

The IAM sent to or received from the CPE uses current accepted ANSI standards to indicate a wideband call. The User Service Information (USI) parameter, in the IAM, indicates the bandwidth of the call. This feature only supports bounded contiguous calls for CPE connections.

ISUP messages (with the exception of the USI parameter) are similar to those used for broadcast calls.

As with call setup, call release can occur in one of two ways. The call is released when a RELease (REL) message is received from either the far-end office or the originating switch. Calls can also be released through maintenance commands, FRLS and BSY, or by a DS1 carrier failure. ISUP protocol requires that trunks states be changed to Idle (IDL) (except for the FRLS command) and the IDBs be unchained.

Routing strategies for wideband calls

Table IBNRTE or Table DNROUTE implements the routing strategies for wideband calls. Table DNROUTE allows a Directory Number (DN) to be associated with a specific trunk group member. This DN is then used to specify the lowest numbered DS0 on the CPE to which the wideband call is supposed to terminate. The incoming call uses the lowest numbered DS0 and bandwidth to connect to the CPE contiguously.

The following validation check helps in the selection of a route:

Only IBNT2 or IBNT0 ISUP trunks with the WB option (Table TRKGRP) can route Nx64 wideband calls.

Hardware requirements

Power—Nx64 Wideband Optionality has no hardware requirements.

Limitations and restrictions

Power—Nx64 Wideband Optionality has no limitations or restrictions.

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Power—Nx64 wideband optionality (end)

Interactions

Power—Nx64 Wideband Optionality has no functionality interactions.

Datafill

Table IBNRTE or Table DNROUTE implements the routing strategies for wideband calls. Table DNROUTE allows a Directory Number (DN) to be associated with a specific trunk group member. This DN is then used to specify the lowest numbered DS0 on the CPE to which the wideband call is supposed to terminate. The incoming call uses the lowest numbered DS0 and bandwidth to connect to the CPE contiguously.

This feature supports only two options for wideband boundary preference (for N = 2-24) in Field WBBOUND in Table TRKGRP (WB). Use the NONCON (Noncontiguous) option for an interswitch network, and use the ANSI option for a Customer Premise Equipment (CPE) interface. If the BNDCON (Bounded Contiguous) option is specified, then N must equal 2, 6, or 24.

Service Orders

Power—Nx64 Wideband Optionality does not affect SERVORD.

Operational measurements

Power—Nx64 Wideband Optionality does not affect operational measurements.

Logs

Power—Nx64 Wideband Optionality does not affect logs.

User interface

Power—Nx64 Wideband Optionality does not change the user interface.

Billing

Power—Nx64 Wideband Optionality does not affect billing.

AD4550**FCC DID answer supervision compliance**

Functionality name

FCC DID Answer Supervision Compliance

Description

This feature makes the MSL-100 switch compliant with the FCC requirement Part 68 requiring a PBX or similar system to return answer supervision to ensure proper billing.

The following items are the requirements for the Commission's Rules and Regulations 68.314 (h):

- Answer supervision associated with DID ports is not readily alterable.
- Equipment returns DID answer supervision no later than 500 milliseconds after the incoming call is:
 - answered by called station
 - answered by an attendant
 - routed to a recorded announcement that can be administered by the PBX operator
 - routed to a dial prompt
- If this equipment has the ability to redirect or forward calls back to the Public Switched Telephone Network (PSTN), it returns answer supervision after:
 - detection of voice energy or removal of audible ringback signal
 - assumes the call is answered after an interval of no more than 20 seconds
- Equipment is not required to return DID answer supervision on incoming calls under the following conditions:
 - audible ringback with no answer
 - busy signal
 - reorder signal

To comply with the FCC requirements, answer supervision must be returned on all trunk-to-trunk calls within 15 seconds. In addition, since the switch operator has the ability to alter the announcements, answer supervision is sent to all trunks that are routed to announcements.

AD4550

FCC DID answer supervision compliance (end)

Hardware requirements

DID trunk interfaces that are not capable of supplying answer supervision may not be provisioned on an MSL-100 switch in the United States.

Limitations and restrictions

The switch operator cannot disable this feature.

This feature is required for all MSL-100 switches in the United States that meet the following requirements:

- manufactured after January 1, 1992
- installed after June 30, 1992
- moved after January 1, 1992

At this time, this software should never be used in any other country.

Interactions

FCC DID Answer Supervision Compliance has no functionality interactions.

Datafill

FCC DID Answer Supervision Compliance does not affect data schema tables or office parameters.

Service Orders

FCC DID Answer Supervision Compliance does not affect SERVORD.

Operational measurements

FCC DID Answer Supervision Compliance does not affect OMs.

Logs

FCC DID Answer Supervision Compliance does not affect logs.

User interface

FCC DID Answer Supervision Compliance does not change the user interface.

Billing

Trunk-to-trunk calls are answered by software after 15 seconds regardless of an actual answer. If one of the trunks returns answer before 15 seconds, billing (if required) begins at that point. When a trunk is routed to an announcement, answer is always returned.

AD7654

Dialable wideband CALLP matrix-to-crossthreads additions

Functionality name

Dialable Wideband CALLP Matrix-to-Crossthreads Additions

Description

This feature supports wideband origination on Integrated Business Network Incoming Trunks (IBNTI). It modifies the wideband functionality so that it supports IBNTI trunks as it does for IBN two-way (IBNT2), IBN outgoing (IBNTO), and IBN Primary Rate Interface (IBNT2 with ISDN PRI signaling) trunks.

A new cross matrix index (CMI) is created to represent the IBN ISDN User Part-IBN (ISUP-IBN) PRI calltype. The correct tables in modules CPTABUI, CPTAB5, CPTAB7 are filled to correctly reflect the processors which are used when an IBN ISUP-IBN PRI calltype is processed.

Hardware requirements

Wideband calls require an enhanced core (ECORE) with an enhanced network (ENET) configuration. The ECORE must contain digital trunk controllers (DTC) equipped with the time switch card, NTAX78AA. This time switch card must also be datafilled in Table LTCINV in the OPTCARD field.

Limitations and restrictions

The following limitations and restrictions apply to Dialable Wideband CALLP Matrix-to-Crossthreads Additions:

- IBNT2 trunks are the only IBN type trunks that support the Nx64 Kb/s feature for ISDN PRI D-channel signaling.
- The DS0s or trunk members datafilled in table TRKMEM have to be datafilled on a DTCI which has the NTAX78AA constant delay time switch card.
- All DS0s used in a call must be datafilled in the same trunk group.
- All DS0s of an Nx64 Kb/s call must lie within the same DS1 span.
- Large dense trunk groups reduce the chance of fragmentation. Dense means that the majority of DS1s belong in a single trunk group.
- For IBNTI type trunks, the Nx64 Kb/s boundary preference must be datafilled in the option field as WIDEBAND followed by WBGRPING.
- For IBNTO and IBNT2 type trunks, the Nx64 Kb/s boundary preference must be datafilled in table TRKGRP for WBGRPING as either FIXED, FLEXIBLE, or FLOATING.

AD7654

Dialable wideband CALLP matrix-to-crossthreads additions (end)

- The Nx64 Kb/s trunk selection sequence must be datafilled in table TRKGRP for WBSELSEQ as either ascending sequential (ASEQ) or descending sequential (DSEQ).
- The Nx64 Kb/s trunk selection method must be datafilled in table TRKGRP for WBSEARCH as either BESTFIT or FIRSTFIT.
- With the completion of this feature, Nx64 Kb/s functionality on IBN type trunks supports the following connection scenarios: ISUP-PRI, PRI-ISUP, ISUP-ISUP, PRI-PRI.
- A 6x50AB DS1 card (revision 67 or greater) is necessary in the DTCI for the Nx64 Kb/s functionality.

Interactions

Dialable Wideband CALLP Matrix-to-Crossthreads Additions has no functionality interactions.

Datafill

Dialable Wideband CALLP Matrix-to-Crossthreads Additions does not affect data schema tables or office parameters.

Service orders

Dialable Wideband CALLP Matrix-to-Crossthreads Additions does not affect SERVORD.

Operational measurements

Dialable Wideband CALLP Matrix-to-Crossthreads Additions does not affect operational measurements.

Logs

Dialable Wideband CALLP Matrix-to-Crossthreads Additions does not affect logs.

User interface

Dialable Wideband CALLP Matrix-to-Crossthreads Additions does not change the user interface.

Billing

Dialable Wideband CALLP Matrix-to-Crossthreads Additions does not affect billing.

AD7655**Digital set support of 64 kbit/s sync data**

Functionality name

Digital Set Support of 64 kbit/s Sync Data

Description

This feature supports the transfer of new data call options to Meridian communication adapter (MCA) data units interfacing with a Meridian SL-100 environment such that all supported features of the Meridian programmable data adapter (MPDA) and added options execute according to specifications. The new data call functions are established through the transfer of configuration parameter messages from the computing module (CM) to the MCA. Such messages are received by a line group controller (LGC) or line trunk controller (LTC) extended peripheral module (XPM), which exists between the CM and MCA along their communication path. Upon receiving a message, the XPM converts it into the appropriate format for transmission toward the MCA. All messages transferred between the XPM and MCA route through an intelligent peripheral equipment (IPE) or a Digital Line Module (DLM) circuit card.

The following changes support the application software:

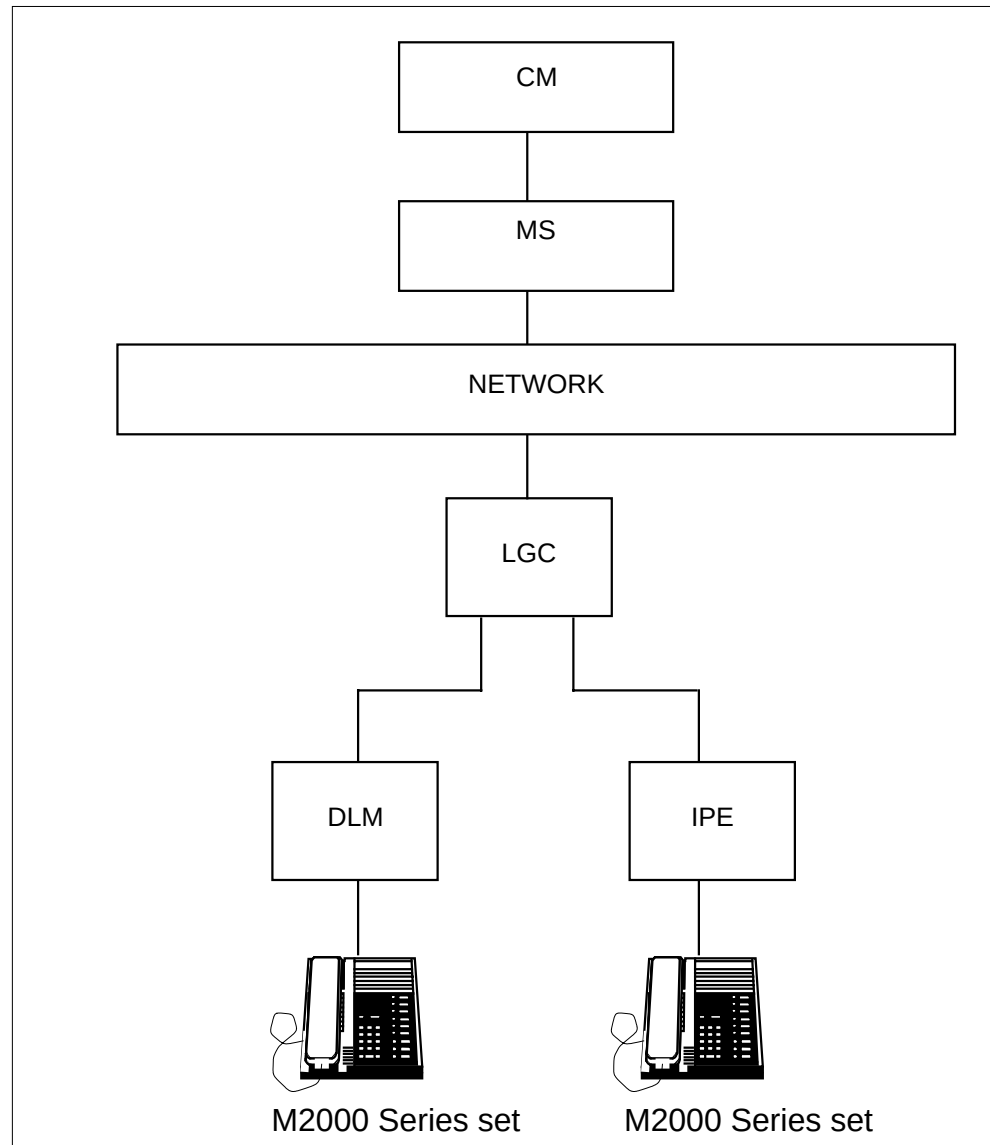
- allows Meridian Telecenter application software to recognize MCA card option
- adds MCA test diagnostics for NT8D02AA, NT8D02AB, NT8D09AB, NT8D09AD, and NT8D03AB enhanced digital port card
- adds MCA test diagnostics for CD8X47BA enhanced digital port card
- allows maintenance users to perform specific tests on MCA as well as query the digital line module (DLM) or intelligent peripheral equipment (IPE) for the status of the mca
- adds predefined error statements used by test modules

Hardware requirements

This feature is used on a Meridian SL-100 LGC or LTC XPM module interfacing with an MCA. The hardware components associated with this feature include Meridian SL-100 switch elements (CM, message switch, Network), LGC or LTC, IPE or DLM, and M2000 series telephone sets containing MCA circuit cards. The following figure provides a pictorial representation of the interface between these hardware elements.

AD7655

Digital set support of 64 kbit/s sync data (continued)



Limitations and restrictions

Digital Set Support of 64 kbit/s Sync Data has no limitations or restrictions.

Interactions

Digital Set Support of 64 kbit/s Sync Data has no functionality interactions.

AD7655**Digital set support of 64 kbit/s sync data** (continued)**Datafill**

The following data schema changes are applicable in this feature:

- adds software for processing table IVDINV to permit the datafilling of MCA as a valid SET_TYPE.
- adds MCA type to data dictionary for logical table IVDINV and binds the type for IPL
- adds necessary changes so that IVDINV table control can add, delete, or validate MCA options
- enhances table DPROFILE processing software to recognize three new parameters for the MCA terminal. Datafill the MCA option and the new V.25, high-level data link control (HDLC) and RTS fields into table DPROFILE. In addition to table control, the software which currently references the MPDA is enhanced by adding support of the MCA.
- includes software to check for valid datafill for line equipment number (LEN), line class code (LCC), and feature keys on M2000 series set
- adds a maintenance code for the MCA terminal to allow the data profile download of the default settings provided in table DPROFILE. This information goes to the MCA during a maintenance return to service (RTS).
- adds recognition of MCA data type when posting and testing a Meridian set at the line test position (LTP)
- allows M2000 series set to recognize MCA as a valid LCC type ID

Service orders

The following commands are affected by this feature when MCA options are applicable: add option (ADO), delete option (DEO), and change keyset line (CKLN). Additionally, service order software is modified to allow automatic datafilling of table DPROFILE for the MCA.

Operational measurements

Digital Set Support of 64 kbit/s Sync Data does not affect operational measurements.

Logs

Digital Set Support of 64 kbit/s Sync Data does not affect logs.

AD7655

Digital set support of 64 kbit/s sync data (end)

User interface

Software is added to allow posting of the MCA at the LTP MAP position. The output of the QLEN and QDN commands is altered for the MCA to display the new V.25, HDLC and RTS options.

Billing

Digital Set Support of 64 kbit/s Sync Data does not affect billing.

AD7656
Line side T1 IPE interface card

Functionality name

Line Side T1 IPE Interface Card

Description

This feature modifies the existing Meridian SL-100 code to recognize the NT5D11AA Line Side T1 Interface (LTI) circuit pack.

Hardware requirements

The product engineering code (PEC), NT5D11AA, is the LTI card, and allows the IPE to interface a T1 with voice mail and voice response equipment.

Limitations and restrictions

The following limitations and restrictions apply to Line Side T1 IPE Interface Card:

- In the system, the LTI behaves like an Analog Line Card.
- This feature does not support T1 carrier diagnostics or alarm messages.
- It is the user's responsibility to ensure that logical datafill for the LTI circuit pack matches the physical circuit pack location. The user also has the responsibility to ensure that ports 8 through 15 of the second card slot are not used.

Interactions

Line Side T1 IPE Interface Card has no functionality interactions.

Datafill

Table LNINV displays the three new card codes 8D02EA, 8D02CC, and 5D11AA as datafill options in the existing list.

The CKTLOC command also displays the new 5D11AA card code.

Service orders

The QUERYPM INVEN CARD and QUERYPM INVEN ALL commands display the new 5D11AA card code.

Operational measurements

Line Side T1 IPE Interface Card does not affect operational measurements.

Logs

Line 101 and PM 181 logs display the new 5D11 option in the card type field.

AD7656

Line side T1 IPE interface card (end)

User interface

Line Side T1 IPE Interface Card does not change the user interface.

Billing

Line Side T1 IPE Interface Card does not affect billing.

AD7658**Fast transfer for digital sets**

Functionality name

Fast Transfer for Digital Sets

Description

The Fast Transfer (FXR) feature is an optional keyset feature that reduces the required number of key strokes for a user to transfer a call to only two keystrokes. The first FXR keystroke establishes the second leg, and the second FXR keystroke transfers the call.

The FXR feature combined with Direct Station Select (DSS) or Busy Lamp Field (BLF) and Meridian Busy Set Station Camp-On (MBSCAMP) features, provide an enhanced functionality to the business set and allow the FXR feature to function at its fullest capability.

The FXR feature is assigned to a line through table control or service orders. The feature allows for the transfer of calls without having to conference. The Call Transfer Recall option is datafilled when assigning the FXR feature to the keyset. This option allows the transferring agent to get called back if no one answers the transferred call after a pre-determined datafilled time.

FXR functionality

The FXR feature can be datafilled on the same set with the Three-Way Call (3WC), Call Transfer (CXR) and Conference Six port circuit (CONF6) features. However, the actual use of these features is mutually exclusive. When one of the features is in use the other features are ignored.

The DSS/BLF lamp has two states, on or off. When the DSS/BLF lamp is off (idle), the FXR and DSS/BLF keys transfer the call with or without announcement. If the terminating agent does not answer and the user has the Call Transfer Recall feature assigned, then the user is recalled after the terminating set rings for the datafilled time interval. When the DSS/BLF lamp is on (busy), the FXR feature should only be used if the MBSCAMP feature is assigned to the set. The caller is camped on to the busy set and continues to receive ringing, silence, music, or an announcement until the call is answered. If the terminating agent does not answer and the recall timer expires, the camped call goes back to the user.

When the MBSCAMP feature is not assigned to the user and the destination set is busy, a call can still transfer to the destination set using the FXR key. The caller hears a busy tone once the call transfers.

AD7658**Fast transfer for digital sets** (continued)

Method of operation for FXR

When a call is presented to the FXR user, the directory number's (DN) liquid crystal display (LCD) flashes and the caller's DN and the called DN are displayed depending on the type of set and datafill. If the terminating agent is unavailable or fails to answer the call, then no further actions are taken. The following table shows the actions initiated by the FXR user.

	User Action	Results
1	Presses the flashing DN key or goes off-hook	The user answers the call and the DN's LCD turns on establishing the first leg of the call. The user is now involved in a two-port call. The user verifies the caller wants to be transferred.
2	Presses the FXR key	The second leg of the call begins. The lamp associated with the FXR key goes solid. The DN lamp associated with the originating agent begins to flash and is on HOLD.
3	Depresses the DSS/BLF key or dials digits	Ideally, the DSS/BLF lamp would be off. If the set is equipped with a display, then the monitored DN (or digits dialed) is displayed on the user's set.
4	May announce to the terminating agent	The call may be announced to the terminating agent before the transfer completes.
5	Presses the flashing FXR key	The call is transferred. The FXR lamp is extinguished as well as the DN lamp associated with the first leg (incoming call). If the set is equipped with a display, then it is updated to reflect that the set is no longer connected to anyone.

AD7658**Fast transfer for digital sets** (continued)**Flip-flopping with FXR**

The FXR user has the ability to flip-flop between the originating agent and the terminating agent as described in the following table.

	User Action	Results
1	Presses the flashing DN key or goes off-hook	The user answers the call and the DN's LCD turns on establishing the first leg of the call. The user is now involved in a two-port call. The user verifies the caller wants to be transferred.
2	Presses the FXR key	The second leg of the call begins. The lamp associated with the FXR key goes solid. The DN lamp associated with the originating agent begins to flash and is on HOLD.
3	Depresses the DSS/BLF key, or dials digits	Ideally, the DSS/BLF lamp is off. If the set is equipped with a display, then the monitored DN (or digits dialed) is displayed on the user's set.
4	Depresses the flashing DN associated with the originating agent	The terminating agent does not want the call transferred, or the user does not want to transfer the call, but would rather confer with the first leg (caller) once more.
5	Presses the flashing FXR key	The user is reconnected to the second leg, but does not lose the connection to the first leg.

AD7658**Fast transfer for digital sets** (continued)

Canceling FXR

The following table describes the actions that take place once the FXR user has a call ringing on the user's set.

	User Action	Results
1	Presses the flashing DN key or goes off-hook	The user answers the call and the DN's LCD turns on establishing the first leg of the call. The user is now involved in a two-port call. The user verifies the caller wants to be transferred to a certain party.
2	Presses the release key	The caller does not want to be transferred. The two-party call releases.
	Presses the FXR key	The second leg of the call starts. The lamp associated with the FXR key goes solid. The DN lamp associated with the originating agent begins to flash and is on HOLD.
3	Presses the release key to stop FXR feature followed by the flashing DN key associated with the originating agent	The user pressed the FXR key by mistake, pressed the wrong DSS/BLF key, or a mistake is made dialing digits and the user wishes to reconnect with the originating agent on the first leg of the call.
4	Presses the FXR key a second time	The FXR key is depressed a second time to transfer the call. At this point, nothing can be done to stop the transfer. The FXR lamp is extinguished as well as the DN lamp associated with the first leg.

Hardware requirements

Fast Transfer for Digital Sets has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Fast Transfer for Digital Sets:

- The FXR feature is restricted to EBS, MBS, and IVD sets and is not compatible with 500/2500 sets.
- The FXR feature does not have conferencing capability.

AD7658**Fast transfer for digital sets** (continued)

- The 3WC, CXR, and CONF6 features and the FXR feature are mutually exclusive, although they can be assigned to the same set. All feature restrictions and limitations that occur with the existing 3WC and CXR features apply to the FXR feature.
- All restrictions and limitations that apply to the DSS/BLF, MBSCAMP, and Recall features also apply when used in conjunction with the FXR feature to transfer a call.
- FXR is a supported feature of Feature Key Templates, but is only on Meridian Business Sets.
- The originator of an incoming trunk to a station using FXR to transfer the caller to a 911 facility can release from the call even though both parties terminate to a 911 agent. The FXR feature functions exactly as 3WC, except that the controller of the 3WC is not allowed to release, but the originator is allowed to release. To prevent the ability of the originator to release, the incoming trunk to the station with FXR should be made over a trunk type of OP or ES when transferring. An incoming trunk of type OP or ES transfers using FXR to an outgoing trunk of type OP and the originator is not allowed to release. However, it cannot be transferred using FXR to an outgoing trunk of type ES.

Interactions

The following paragraphs describe the interactions between Fast Transfer for Digital Sets and other functionalities.

The FXR feature has the same feature interactions as the existing 3WC and CXR features. The following table shows a list of the most commonly used feature interactions.

(Sheet 1 of 2)

Feature	Interaction
Call Forward	If the terminator of the second leg of a FXR call has CFU, then the call forwards as in normal CFU operations.
Call Hold	A held party cannot initiate a FXR call.
Call Park (PRK)	The PRK retrieve access code is dialed as the second leg of a FXR call followed by the DN of the call to be retrieved.

AD7658**Fast transfer for digital sets** (continued)

(Sheet 2 of 2)

Feature	Interaction
Call Pickup (CPU)	A CPU member can pickup a call which is the second leg of a FXR call. A CPU member can pickup a call as the second leg of a FXR call by pressing the FXR key to place the originator on hold and then pressing the CPU key to pickup the ringing member followed by the FXR key to transfer the originator.
Multiple Appearance Directory Number (MADN)	Any member of a FXR call may be a MADN member, Multiple Call Arrangement (MCA) or Single Call Arrangement (SCA).
Inspect	When the INSPECT feature is active on the business set, the user is able to verify the FXR feature by pressing the inspect key and then the FXR key. When the INSPECT feature is assigned to a set with a display, the feature name datafill for the FXR feature displays on the top line. This feature name is "Fast Transfer".

The FXR feature combined with DSS/BLF, or MBSCAMP features provides an enhanced functionality to the business set. However, they can be used independently. When using the DSS/BLF key to set up the second leg of the call, all feature interactions that are presently defined with respect to the terminating agent are valid.

When this feature interacts with the MBSCAMP feature, all feature interactions remain unchanged.

The Blind Transfer Recall functionality remains unchanged and acts as it does with the 3WC or CXR feature.

When a call transfers using the FXR feature, the caller's and destination's business sets show the same reason display as a call transfer through the regular 3WC or CXR features.

The FXR feature is supported by feature groups. If a business set belongs to a feature group, then the option of the specific activity must be assigned to the feature group in order to enable the assignment of that activity on a key on the set. Attempts to assign the key, using service orders, are denied for business sets belonging to a feature group which does not have the option assigned.

AD7658**Fast transfer for digital sets** (continued)

The FXR feature currently interacts with B911. Once a call is made to a 911 operator, the operator has total control of that call. This means that the originator of the call cannot release the 911 operator, nor can the originator put the 911 operator on hold. The user of the FXR feature is not prevented from dialing the 911 operator. However, once connected to the operator, the call is in the hands of the operator. In effect, this means that the FXR controller cannot flip back to the first leg, nor can the controller transfer the call. This call can only be terminated by the 911 operator.

This feature provides the functionality to setup call supervision so that the originator on the first leg of the call cannot release.

Note: The first leg of the call can still be released by the original caller if call supervision is not setup.

Datafill

FXR is added to the valid range of features which may be datafilled on an EBS, MBS, or an Integrated Voice Data (IVD) set feature key in table KSETFEAT.

FXR is added to the valid range of feature options which may be datafilled on a MBS feature group in table FTRGOPTS.

Table OPTOPT now includes the FXR option. The FXR option includes a list of options with which it is incompatible. The incompatible options are the same as the options that are incompatible with 3WC.

Table LCCOPT now includes the FXR option.

Service orders

The FXR key is a feature assigned to feature keys on an EBS, MBS, or an IVD set. This is done when the line is initially set up using the NEW command. It can also be added, changed, and deleted from an existing business set using the Add Option (ADO), Changed Feature (CHF), and Delete Option (DEO) commands in SERVORD. The FXR key is deleted from a line when the line is removed using the OUT command.

The FXR option on a line can be viewed using the QLEN or QDN command.

Operational measurements

The same Operational Measurements (OM) used for 3WC are used for FXR. The following OM's in group TWCIBN are pegged: TWCATT, TWCATT2, TWCFAIL, TWCOVFL, CXFRATT, CFXRATT2, and CXFRFAIL.

AD7658

Fast transfer for digital sets (end)

Logs

Fast Transfer for Digital Sets does not affect logs.

User interface

Fast Transfer for Digital Sets does not change the user interface.

Billing

AMA or SMDR Billing is the same as with the existing 3WC and CXR feature.

- A station is billed for whatever leg it originated the FXR.
- Once the call transfers, the originator is billed for those legs that were originated. Essentially, the user is charged as if the originator originated the transferred call rather than just transferred it.

AD7664

MAGISTRAND SS7 wideband feature robustification

Functionality name

MAGISTRAND SS7 Wideband Feature Robustification

Description

This feature corrects two wideband robustness problems residing in the DMS100 common (CCM) layer. The first correction stops TRAPS from occurring when a call attempt is out of the fixed range of a fixed wideband trunkgroup. The second correction stops non-contiguous calls from TRAPing when an error condition occurs.

With some slight code modifications, the rejected wideband call follows the narrowband call treatment path if rejected. This enhances the robustness by blocking erroneous wideband calls and treating them accordingly.

Message protocols

Although MAGISTRAND only deals with Common Channel Signaling (SS7) wideband messaging protocols, this feature also interacts with other types of wideband calls.

Hardware requirements

Wideband calls require an ECORE with ENET configuration and a digital trunk controller (DTC) equipped with a time switch card (NTAX78AA). Additionally, the DCTAX78 option must be datafilled in the OPTCARD field of table LTCINV.

Limitations and restrictions

This feature only interacts with SS7 wideband initiated calls.

Interactions

MAGISTRAND SS7 Wideband Feature Robustification has no functionality interactions.

Datafill

MAGISTRAND SS7 Wideband Feature Robustification does not affect data schema tables or office parameters.

Service orders

MAGISTRAND SS7 Wideband Feature Robustification does not affect SERVORD.

AD7664

MAGISTRAND SS7 wideband feature robustification (end)

Operational measurements

MAGISTRAND SS7 Wideband Feature Robustification does not affect operational measurements.

Logs

MAGISTRAND SS7 Wideband Feature Robustification does not affect logs.

User interface

MAGISTRAND SS7 Wideband Feature Robustification does not change the user interface.

Billing

MAGISTRAND SS7 Wideband Feature Robustification does not affect billing.

AD7674**Auto recovery DLMs/IPEs****Functionality name**

Auto Recovery DLMs/IPEs

Description

The Auto Recovery DLM/IPE feature implements the conversion of the DLM and IPE peripherals to use the System Recovery Controller (SRC) to coordinate automatic recovery activities.

The SRC is software that acts as a high-level intelligence to coordinate the work and optimize the system resources necessary for automatic recovery following system restarts and degradations.

The most visible functionality gained from this feature is the ability to automatically broadcast-load groups of DLM/IPE peripherals. Before this feature, broadcast-loading was only possible by use of manual commands.

A DLM node consists of two units, while the IPE node consists only of a single unit (the IPE node itself). Therefore, the IPE interacts with the SRC and its utilities as a node, while recovery for the DLM occurs for the entire DLM node and the two individual units.

DLM and IPE units are grouped with other DLM/IPE units for broadcast-loading by the following criteria:

- load-file name
- C-side Extended Peripheral Module (XPM) node type
 - Remote Cluster Controller (RCC), RCC2
 - Line Group Controller (LGC), LGCI, Line Trunk Controller (LTC), and LTCI

The system maintains these static groups automatically over time as datafill changes. The SRC builds dynamic groups (subgroups) of these static groups as needed during recovery activities.

As an example of static grouping, the system puts two DLMs or IPEs that have the same load-file name, but subtend different C-side XPM node types into different groups.

Hardware requirements

Auto Recovery DLMs/IPEs has no hardware requirements.

AD7674

Auto recovery DLMs/IPEs (continued)

Limitations and restrictions

The following limitations and restrictions apply to Auto Recovery DLMs/IPEs:

- The system loads DLM/IPE units that cannot be grouped singly with other DLM/IPE units for broadcast-loading.
- DLMs and IPEs cannot be grouped together for a broadcast-load.

For automatic broadcast-loading, both the DLM and IPE peripherals must have valid load-file names datafilled for them in the following tables:

- DLMINV or IPEINV, respectively
- PMLOADS

DLM/IPEs can only be broadcast-loaded with other DLM/IPEs if they subtend the same C-side XPM node type. There are two types of C-side XPMs applicable to this feature: the RCC family and the LGC/LTC family.

Interactions

The SRC coordinates the broadcast-loading of each member of the group. It also monitors and controls the number of concurrent PM loading tasks.

Manual intervention through the MAP terminal can override any recovery activity. Only the ABTK and BSY (with FORCE option) commands permit manual intervention with system recovery activities. When used, the user is notified and prompted to continue.

Datafill

Auto Recovery DLMs/IPEs does not affect data schema tables or office parameters.

Service Orders

Auto Recovery DLMs/IPEs does not affect SERVORD.

Operational measurements

Auto Recovery DLMs/IPEs does not affect operational measurements.

Logs

Auto Recovery DLMs/IPEs does not affect logs.

AD7674**Auto recovery DLMs/IPEs (continued)**

User interface**Accessing the main directory**

To access the top level Peripheral Module (PM) directory, the user enters the following command:

MAPCI;MTC;PM

Accessing directories for specific peripherals

To access the directory for the specific DLM or IPE directory, the user enters the following appropriate command:

- **MAPCI;MTC;PM;POST DLM ALL**
- **MAPCI;MTC;PM;POST IPE ALL**

At this point, either DLMDIR or IPEDIR is accessed, depending on which peripherals are posted. In addition, NPMDIR is also accessed.

A system-recovery progress indicator appears where regular maintenance messages appear for a posted PM. The text that displays on the map workstation is **System Recovery**. This implies that the posted PM is under control of some SRC-related activity. Specifically, this indicates that the peripheral is awaiting other group members to initiate a load request. A system-busy (SYSB) DLM may be under the control of the SRC when this particular progress indicator is not displayed.

Return to CI

To return to the CI level, the user enters the following command:

QUIT MAPCI

Command description

The POST command at the PM level of the MAP allows a PM or a set of PMs to be selected.

The ABTK command provides the user with the ability to abort any maintenance activity on a peripheral unit. If any unit of the peripheral posted on the MAP terminal is involved in system recovery, the system notifies and prompts the user to continue. The prompt allows the user to stop the abort attempt after noting that system recovery is in progress.

The busy (BSY) command allows the user to place a peripheral, which is posted on the MAP workstation, in the MANB state. Without the FORCE option, any system-recovery maintenance activities running on the peripheral

AD7674

Auto recovery DLMs/IPEs (end)

are executed. That is, no state change occurs. The FORCE option aborts system-recovery maintenance activities and changes the state of the peripheral to MANB.

The activity may be on either the entire node or one or both of the units, in the case of the DLM.

For both the ABTK and BSY (with FORCE option) commands, the actual system action to interrupt the recovery activity is executed only after the user is prompted and chooses to proceed.

Billing

Auto Recovery DLMs/IPEs does not affect billing.

AD8418**Attendant console end-to-end signaling over PRI****Functionality name**

Attendant Console End-to-End Signaling Over PRI

Description

This feature allows an attendant console (AC) to output dual tone multi-frequency (DTMF) tones through a DTMF sender across a primary rate interface (PRI) trunk. This feature also enhances the attendant console end-to-end signaling (ACEES) functionality so that correct supervision between the DTMF sender and PRI trunk occurs.

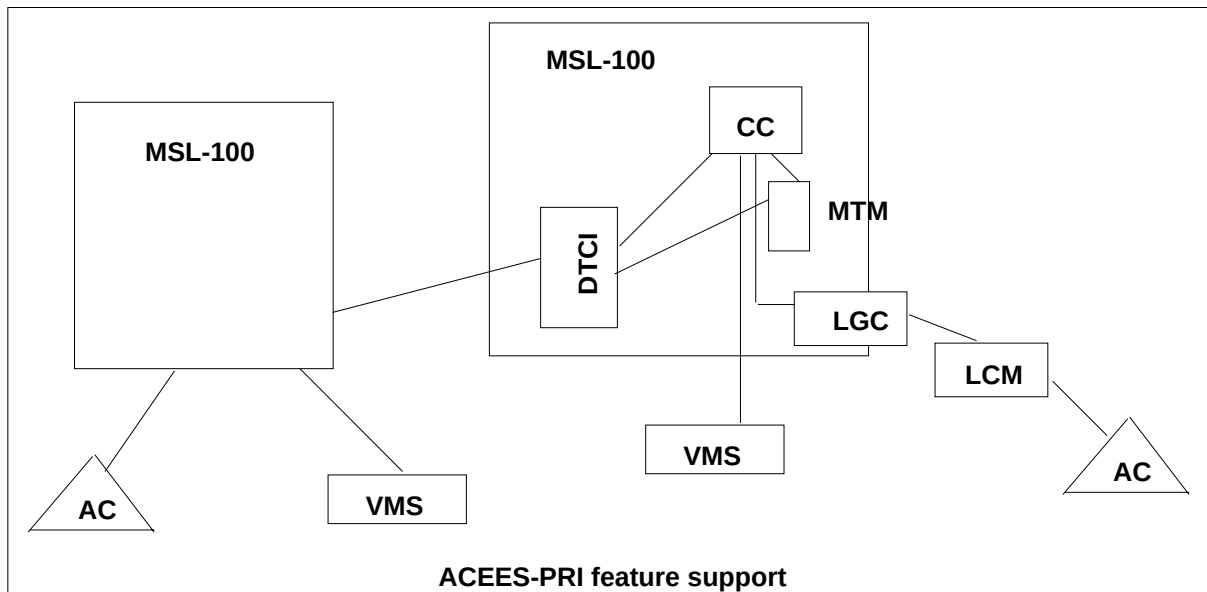
Hardware requirements

Attendant Console End-to-End Signaling Over PRI has no hardware requirements.

Limitations and restrictions

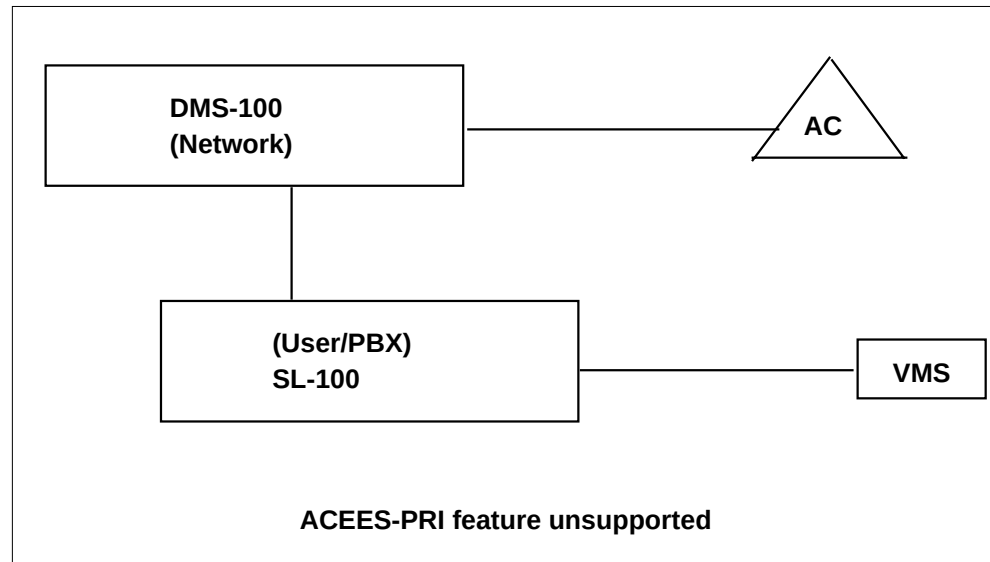
The following limitations and restrictions apply to Attendant Console End-to-End Signaling Over PRI:

- voice mail system (VMS) on network side, AC on MSL-100
- VMS on MSL-100, AC on network side
- AC on MSL-100, VMS on same node through looped back PRI trunks
- This feature does not support any DMS-100 configurations.



AD8418

Attendant console end-to-end signaling over PRI (continued)



Note: This feature only supports Nortel North America (NTNA) PRI variant.

Interactions

Attendant Console End-to-End Signaling Over PRI has no functionality interactions.

Datafill

Attendant Console End-to-End Signaling Over PRI does not affect data schema tables or office parameters.

Service orders

Attendant Console End-to-End Signaling Over PRI does not affect SERVORD.

Operational measurements

Attendant Console End-to-End Signaling Over PRI does not affect operational measurements.

Logs

Attendant Console End-to-End Signaling Over PRI does not affect logs.

AD8418

Attendant console end-to-end signaling over PRI (end)

User interface

Attendant Console End-to-End Signaling Over PRI does not change the user interface.

Billing

Attendant Console End-to-End Signaling Over PRI does not affect billing.

AD8419

Secure set feature support for MSL

Functionality name

Secure Set Feature Support for MSL

Description

This feature activates the secure set option (SSO) for the M5009S secure set using the following layers:

- Meridian Stored Logic (MSL)
- DMS-100 Common (CCM)
- Canadian-North American (CNA)
- Extended Peripheral Module (XPM)

The MSL layer relies on software support from the CCM, CNA, and XPM layers to add the SSO feature as an option to an M5009S and M2616S secure set in tables KSETINV and IVDINV respectively.

The CCM layer contains particular type definitions, constants, and initialization codes which are needed for the SSO to function properly with respect to the M5009S and the M2616S secure phone sets.

The CNA layer provides the COPYSET command through SERVORD to copy an array of options of a given phone set to a group of sets that should have the same set of options.

The XPM layer uses the SSO sent from the computing module (CM) to differentiate a secure set from a non-secure set. The secure set function uses a local ringer to generate a warble tone that notifies the user of an incoming call terminating on any other directory number (DN). A buzzer is used to notify the user of a non-secure set.

Additionally, this feature provides service order (SERVORD) functionality for the SSO. The SSO is assigned to the M5009S on a per set basis using the first DN key on the phone set.

Hardware requirements

This feature uses M5009S and M2016S secure sets.

Limitations and restrictions

The secure and non-secure sets should not be mixed within the multiple appearance directory number (MADN) group. If this occurs, a functional difference in feature notification with respect to the buzz tone could occur on

AD8419**Secure set feature support for MSL (end)**

the non-secure M5009 sets within a particular MADN group if the incoming call is assigned to a secure DN.

Hence, the MADN feature would be used in conjunction with the SSO feature only in the event all phone sets of the MADN group are secure sets.

There is no audible notification for Query Busy Station (QBS), Call Back Queueing (CBQ), Call Waiting, or Group Intercom on a secure set. The only indication for these features and options is the flashing lamp notification on a secure set.

Interactions

The SSO can be added to a non-secure M5009 phone set, therefore make sure to add the SSO to the correct phone set.

Datafill

The SSO is added to tables KSETINV and IVDINV as an option. The tables sizes are not affected.

Service orders

This feature allows the current SERVORD commands, ADO, DEO, and COPYSET, to manipulate the SSO. However, since the M2616S is an IVD set, the copyset command will not work with it.

Operational measurements

Secure Set Feature Support for MSL does not affect operational measurements.

Logs

Secure Set Feature Support for MSL does not affect logs.

User interface

Secure Set Feature Support for MSL does not change the user interface.

Billing

Secure Set Feature Support for MSL does not affect billing.

AD8420

Software activation of M2008 handsfree

Functionality name

Software Activation of M2008 Handsfree

Description

This feature allows handsfree to be enabled or disabled on physical key 7 on the new M2008HF sets using the CHF command in SERVORD. Other features can be assigned to key 7 as long as handsfree is not set to `Y' in SERVORD. The M2008HF sets are shipped from the factory with the handsfree switch set to enable. Once the customer upgrades to MSL06 or later, handsfree becomes software controlled for the M2008HF sets.

Hardware requirements

The product equipment code (PEC) for the M2008HF is NT2K08GP. This feature supports M2008HF sets connected to a digital line module (DLM) and intelligent peripheral equipment (IPE).

Limitations and restrictions

The following limitations and restrictions apply to MSL06: Software Activation of M2008 Handsfree:

- Adding the handsfree field for all M2008s allows the original M2008 to be set to `Y' in SERVORD even though the phone is incapable of handsfree. This is why the warning message is generated to ensure that the M2008 set is handsfree capable.
- Other features can be programmed on key 7 of the M2008HF as long as handsfree is set to `N'.

Interactions

Software Activation of M2008 Handsfree has no functionality interactions.

Datafill

The handsfree field is added to the M2008 set type in KSETYPES. The default value for handsfree is set to N in the IVDINV table located in the MSL layer.

Service orders

SERVORD allows the handsfree feature to be enabled or disabled on physical key 7 for M2008 set types. Perform this action through the CHF command instead of the ADO command, since handsfree is a feature, not an option. After handsfree is added to a M2008 set, a warning message displays whenever the handsfree field is set to Y. This reminds the user to ensure that the M2008 phone being assigned handsfree is a M2008HF set.

AD8420

Software activation of M2008 handsfree (end)

Operational measurements

Software Activation of M2008 Handsfree does not affect operational measurements.

Logs

Software Activation of M2008 Handsfree does not affect logs.

User interface

Software Activation of M2008 Handsfree does not change the user interface.

Billing

Software Activation of M2008 Handsfree does not affect billing.

AD8422

Multiple station message waiting indicators

Functionality name

Multiple Station Message Waiting Indicators

Description

This feature provides the main functionality for the Multiple Station Message Waiting Indication (MSMWI) key set feature. MSMWI provides a visual indication of a message waiting for a primary terminal on one or more secondary terminals. A primary terminal must be datafilled with the Message Waiting (MWT) or Executive Message Waiting (EMW) feature. All attempts to remove MWT or EMW from the primary terminal are blocked until all MSMWI assignments associated with that primary terminal are removed from the corresponding secondary terminals.

The visual indication on the secondary terminals consists of the lighting of the liquid-crystal display (LCD) lamp associated with the MSMWI key. When message waiting indication is set for the primary terminal, the LCD lamp associated with the corresponding MSMWI key on the secondary terminal(s) is turned on (lit in a steady state). When message waiting indication is turned off for the primary terminal, the LCD lamp associated with the corresponding MSMWI key on the secondary terminal is turned off.

Note: If the terminal datafilled with the MSMWI key set feature has an light-emitting diode (LED), it will not be used in conjunction with this feature.

The MSMWI key set feature only provides a visual indication of messages left against a primary terminal. Existing methods for accessing messages are unaffected by this feature, and may still be used. Additionally, the MSMWI key set feature behaves over restarts and activity switches similar to other message-related features.

Hardware requirements

The MSMWI key set feature functions with valid terminal types on the following peripheral modules:

- AccessNode
- digital line module (DLM), Remote DLM (RDLM)
- intelligent peripheral equipment (IPE)
- line concentrating module (LCM), enhanced LCM (ELCM), remote LCM (RLCM), LCME (ISDN)

AD8422**Multiple station message waiting indicators** (continued)**Limitations and restrictions**

The following limitations and restrictions apply to Multiple Station Message Waiting Indicators:

The primary and secondary terminals associated with instances of the MSMWI key set feature must be of one of the valid terminal types. Refer to the table in the Datafill section.

The MSMWI key set feature can only be associated with a primary terminal which has one of the following features assigned:

- Message Waiting (MWT)
- Executive Message Waiting (EMW)

Once MSMWI has been assigned to one or more secondary terminals, attempts to remove MWT or EMW from the primary terminal are blocked until the corresponding secondary terminals have MSMWI removed. When such an attempt is made, an appropriate message is presented.

Interactions

The following paragraphs describe the interactions between Multiple Station Message Waiting Indicators and other functionalities.

The MSMWI key set feature relies on existing message waiting features (MWT and EMW) to provide the described visual indication. It does not interact directly with any voice mail system, but instead updates the MSMWI key lamps on secondary terminals when the corresponding indication is set on the primary terminal.

The MSMWI key set feature does not affect the existing functionality of the MWT or EMW features.

AD8422**Multiple station message waiting indicators** (continued)

Datafill**Table name: KSETFEAT**

Table KSETFEAT allows the MSMWI key set feature to be datafilled against the applicable terminal types. The valid terminal types compatible with MSMWI are shown in the following table.

(Sheet 1 of 2)

Terminal Description	Terminal Type
Proprietary Business Sets	PSET
	PSET with display
M2000 Digital Telephones (Digital IVD Sets)	M2009
	M2018
	M2112
	M2317
Meridian Modular Telephones (Digital)	M2006
	M2008
	M2016
	M2016S
	M2216
	M2616
Meridian Business Sets	M5008
	M5009
	M5009S
	M5112
	M5208
	M5209
	M5212
	M5216

AD8422**Multiple station message waiting indicators** (continued)

(Sheet 2 of 2)

Terminal Description	Terminal Type
	M5312
	M5316

Note: The MSMWI key set feature is only assigned through service orders (SERVORD).

The following figure is an example of KSETFEAT tuple with MSMWI.

```

CI:
>table ksetfeat; format pack
MACHINES NOT IN SYNC – DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE – DMOS NOT ALLOWED
TABLE: KSETFEAT
<line length>:      76 columns can be output per line.
<pack mode>:       Pack mode is ON.
<indent column>:   Indented column of output is column 1.
<first column>:    The first column of output is column 1.
>pos lcml 00 1 08 31 5 msmwi
LCM0 00 0 08 31 5 MSMWI MSMWI IPE1 01 0 08 14 4
>

```

AD8422**Multiple station message waiting indicators** (continued)

The following table breaks down the data in the previous tuple.

Field Name	Description	Value
FEATKEY	LEN of secondary terminal	LCM0 00 0 08 31
	Key on secondary terminal	5 (see note a.)
	Key set feature	MSMWI
FEATURE	Key set feature	MSMWI
KVAR	LEN of primary terminal	IPE 01 0 08 14
	Key of primary terminal	4 (see note b.)
Note: a. This is the key on the secondary terminal to which MSMWI is assigned.b. This key on the primary terminal must have either MWT or EMW assigned.		

Table name: MSMWI

Table MSMWI is created in the MSL layer to maintain a direct mapping between the primary terminals and the associated secondary terminals. The table is a read only table and no modifications may be made directly to it at the CI prompt. Any modifications to this table will be made directly as table KSETFEAT is updated.

Note: The MSMWI key set feature is only to be assigned through SERVORD.

The following example shows a MSMWI tuple.

AD8422**Multiple station message waiting indicators** (continued)

```

CI:
>table msmwi; format pack
MACHINES NOT IN SYNC – DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE – DMOS NOT ALLOWED
TABLE: KSETFEAT
<line length>:      76 columns can be output per line.
<pack mode>:       Pack mode is ON.
<indent column>:   Indented lines will begin in column 1.
<first column>:    The first column of output is column 1.
>pos ipe1 01 0 08 14 4
IPE1 01 0 08 14 4 LCM0 00 0 08 31 5
>

```

The following table breaks down the data in the previous tuple.

Field Name	Description	Value
MSMWIKEY	LEN of primary terminal	IPE1 01 0 08 14
	Key on primary terminal	4 (see note a.)
	LEN of secondary terminal	LCM0 00 0 08 31
	Key on secondary terminal	5 (see note b.)
Note: a. This key on the primary terminal must have either MWT or EMW assigned. b. This is the key on the secondary terminal to which MSMWI is assigned.		

Service orders

The MSMWI line options are introduced to allow key set feature MSMWI to be datafilled through SERVORD.

The MSMWI key set feature is datafilled and manipulated through the use of the following SERVORD commands:

- NEW command
- ADO command
- DEO command

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Multiple station message waiting indicators (end)

- CHF command
- COPYSET command (in conjunction with the SETMODEL option)

The NEW command establishes service for an unassigned set. When establishing service with the NEW command, options and features can be assigned to the set.

The ADO command adds options and features to an existing set. The MSMWI feature can be assigned to a set through the use of the ADO command.

The DEO command deletes options and features from a set. The MSMWI feature can be deleted from a set through the use of the DEO command.

The CHF command changes feature data for a feature previously assigned to a set. The MSMWI feature can be changed through the use of the CHF command.

The COPYSET command, used in conjunction with the SETMODEL option, establishes service for up to 100 new sets using an existing set as a model. The MSMWI feature, if assigned to a key on a set with the SETMODEL option, can be assigned through the COPYSET command to the new sets.

Note: The COPYSET command requires unassigned or unused DN or LEN combinations for the new sets which it datafills.

Operational measurements

Multiple Station Message Waiting Indicators does not affect operational measurements.

Logs

Multiple Station Message Waiting Indicators does not affect logs.

User interface

Multiple Station Message Waiting Indicators does not change the user interface.

Billing

Multiple Station Message Waiting Indicators does not affect billing.

AD8425**MSL changes to support DBCP ANI validation**

Functionality name

MSL Changes to Support DBCP ANI Validation

Description

Database Control Point (DBCP) Automatic Number Identification (ANI) validation provides network services software (NSS) the capability of remotely validating an ANI number by providing a transaction capabilities application part (TCAP) message interface to table ANIDATA.

This feature provides the flexibility of choosing an ANI validation method on a dial plan basis. The following validation methods are available:

- inswitch—ANIs are screened using a locally provided table of ANI information.
- remote—ANIs are screened by querying a remote ANI information table. This is accomplished by using the DBCP functions in conjunction with TCAP messaging, which is a standardized part of the Signaling System 7 (SS7) protocol.
- both—ANI screening is performed locally, and if the ANI is not found within the locally available ANI information table, the screening procedure queries the remote table.

This feature further develops the ANI validation application on the DBCP to process ANI validation TCAP queries and send responses back to the originating node, as well as enhances the TRAnslation VERification (TRAVER) utility to handle remote ANI validation.

Hardware requirements

Access to DBCP applications is through an SS7 network using TCAP signaling. As such, the following hardware is required:

- SuperNode cabinet system or SuperNode SE (SNSE) system
- link peripheral processor (LPP) or single shelf LPP on SNSE

TCAP interface

To further expand this feature, OEM interfacing capabilities allows for off-loading database administration to third-party equipment. A destination digits field is added to the query and response messages. Within the query message, this field is loaded with the dialed digits of the incoming FGD call, and is 18 digits in length. Upon return, the destination digits field of the response message replaces the original dialed digits, and the call proceeds to

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MSL changes to support DBCP ANI validation (continued)

translation on the newly replaced dialed digits. The office variable NSS_DBCP_ANI_REPLACE_DR which is either Yes or No, controls this function. If it is datafilled as Yes, then the dialed digits are replaced with the digits in the destination digits field of the TCAP response message. If it is datafilled as No, then the destination digits field of the TCAP response message are ignored and the call translates on the original dialed digits.

It should be noted that this feature handles the destination digits field at the DBCP by taking this field from the query message and immediately reinserting it in the response message. The end result of this is that if the DBCP is a DMS controlled by this feature, sending out the dialed digits in this field within the query message results in having these same digits sent back in the response message, making the status of the office variable NSS_DBCP_ANI_REPLACE_DR irrelevant. It is only when an external SCP is handling the DBCP functions of ANIDATA that this office variable becomes relevant.

Note: Any third party application wishing to provide ANIDATA services in place of the DMS product must ensure to duplicate the ANIDATA functionality exactly as presented in this document, or risk causing serious network breakdown.

Limitations and restrictions

MSL Changes to Support DBCP ANI Validation has no limitations or restrictions.

Interactions

The following paragraphs describe the interactions between MSL Changes to Support DBCP ANI Validation and other functionalities.

This feature operates with any Network Services System (NSS) based Meridian SL-100 SuperNode system.

This feature is a direct extension of the functionality provided in feature AD2857, NSSFGD ANI Screening Database. It is designed as a member of the NSS TCAP application suite, and has a mild interaction with features AD2856, NSS Travel Card Number and AD3466, NSS Replace Dialed Digits. It does not, however, have any impact on these features, nor do they have any impact on this feature.

Additionally, this feature requires the services provided by features AD2857, AD2471, NSS Offnet Access Dialing Plan Driver, and AD2472, NSS DBCP Base.

AD8425**MSL changes to support DBCP ANI validation** (continued)**Datafill**

Table control for table DIALPLAN has been changed to accommodate DBCP ANI validation. The following table shows the first layer fields for table DIALPLAN.

Field Name	Range of Values	Status	Default Value
DIALPLAN	16-char vector	Unchanged	n/a
PLANTYPE	NONE, HOTLINE, SENDERIZ, CUTTHRU	Unchanged	n/a
OPTIONS	CONDHL, TIMEOUT, \$	Unchanged	\$

The table control changes involve modifications to subfields of field PLANTYPE, for the specific plan types of NONE and CUTTHRU. The following table shows the subfield modifications for a PLANTYPE of NONE.

Field Name	Range of Values	Status	Default Value
ANIVALID	INSWITCH, REMOTE, BOTH	New	INSWITCH

The subfield modifications for a PLANTYPE of CUTTHRU are shown in the following table.

Field Name	Range of Values	Status	Default Value
CUTHRUTY	DESTONLY, AUTHONLY, TCNONLY, AUTHORTC	Unchanged	n/a
ANIVALID	INSWITCH, REMOTE, BOTH	New	INSWITCH

The ANIVALID subfield specifies whether ANI validation is done locally without the use of the DBCP application (INSWITCH), remotely through the DBCP application (REMOTE), or first locally, and if that fails, then remotely, (BOTH).

AD8425**MSL changes to support DBCP ANI validation** (continued)

In both of the above cases (PLANTYPE = NONE and PLANTYPE = CUTTHRU), the ANIVALID subfield has two subfields, CLG_ADDR and CLD_ADDR, which represent calling address and called address, respectively. The expected values for these two fields are 10 digit numbers that identify the node requesting remote DBCP ANI validation and the node processing the remote validation request. The following table illustrates this arrangement:

Field Name	Range of Values	Status	Default Value
CLD_ADDR	Vector 0 to 9 of digit	New	n/a
CLG_ADDR	Vector 0 to 9 of digit	New	n/a

Service orders

MSL Changes to Support DBCP ANI Validation does not affect SERVORD.

Operational measurements

This feature uses the standard operational measurements (OM) registers available through OM group NSSTCAP. This feature is registered as a key application called NSSANI and shows uses the command OMSHOW NSSTCAP.

The OM registers are currently defined as follows:

- NTWKPROB—network problem
- NORESRCE—no resource
- QRYPROCD—query processed
- TIMEREXP—timer expired
- QRYSENT—query sent
- INVDIGIT—invalid digits
- TCNFREEC—TCN free call (not applicable)

Logs

This feature introduces log NSS 108, that handles specific ANI validation database lookup failures for both originating and terminating DBCP nodes. It also introduces log NSS 109, which is a catch-all log designed to alert users of configuration errors within the three NSS TCAP applications: remote ANI validation, remote TCN validation, and replace dialed digits. In addition, this feature uses several logs already available within the NSS software.

AD8425**MSL changes to support DBCP ANI validation** (continued)

All logs contain the date, time, the called address of the message, ANI digits, and application name.

NSS 102—query protocol problem

This log is generated on the originating node when it receives a reject response from the DBCP. This response notifies the originator that there is a problem in the query protocol.

Log NSS 102 contains the following fields:

- **APPLICATION**—Identifies the application that is sending the non-standard protocol query. (NSS_ANI in this case).
- **CALLED ADDRESS**—10 digit field that identifies the DBCP node that rejects the query.
- **PROBLEM TYPE**—Indicates the protocol problem. This can be one of the following: **NIL_PROBLEM**, **GENERAL_PROBLEM**, **INVOKE_PROBLEM**, **RESULT_PROBLEM**, **ERROR_PROBLEM**, **TRANSACT_PROBLEM**, **MAX_PROBLEM_FAMILY**, or **UNKNOWN_PROBLEM**.
- **PROBLEM_CODE**—Indicates the protocol problem. It is a generic SCCP / TCAP problem code.

NSS 104—routing problem

This log is generated on either the originating or terminating DBCP nodes when table MSGRTE is not datafilled properly, or no route is defined at all for the calling or called addresses of the DBCP message.

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MSL changes to support DBCP ANI validation (continued)

Log NSS 104 contains the following fields:

- APPLICATION—identifies the application that is encountering the problem. (NSS_ANI in this case).
- CALLED ADDRESS—10 digit field that identifies the entry not correctly datafilled in table MSGRTE.
- REASON—Problem code for the MSGRTE error. There are two types of reasons:
 - MSGRTE_NOT_DATAFILLED, which means that the CALLED_ADDRESS is not datafilled in table MSGRTE, or
 - INVALID_MSGRTE, which means that the routing information provided in the MSGRTE tuple is not correct.

Note: When a tuple in MSGRTE is datafilled as PRA and the PRA D-channel is not in-service, then the log reason will indicate MSGRTE_NOT_DATAFILLED. When the PRA D-channel is in-service the log reason will indicate INVALID_MSGRTE.

NSS 105—DBCP response protocol problem

This log is generated on the DBCP node when it receives a unidirectional message back from the originating node. This response notifies the terminating node that there is a problem in the response protocol. This occurs when the originating node cannot decode the response it receives from the DBCP.

Log NSS 105 contains the following fields:

- APPLICATION—identifies the application where the response protocol error occurred. (NSS_ANI in this case).
- CALLED ADDRESS—10 digit field that identifies the SSP node that could not decode the response.
- PROBLEM TYPE—indicates the protocol problem. This can be one of the following entries: NIL_PROBLEM, GENERAL_PROBLEM, INVOKE_PROBLEM, RESULT_PROBLEM, ERROR_PROBLEM, TRANSACT_PROBLEM, MAX_PROBLEM_FAMILY, or UNKNOWN_PROBLEM.
- PROBLEM CODE—indicates the protocol problem. It is a generic SCCP / TCAP problem code.

AD8425**MSL changes to support DBCP ANI validation** (continued)**NSS 106—DBCP invalid data in response message**

This log is generated on the DBCP node when it receives a unidirectional message back from the originating node. This response notifies the terminating node that there was a protocol error in the DBCP response. Unlike logs NSS 102, 104, and 105, the status of NSS 106 is changed.

Log NSS 106 contains the following fields:

- **APPLICATION**—identifies the application that is sending the non-standard protocol query. (NSS_ANI in this case).
- **CALLED ADDRESS**—10 digit field that identifies the DBCP node that rejects the query.
- **INVALID FIELD**—indicates the protocol problem. This can be one of the following: account code required (ACR), network class of service (NCOS), network identification (NETID), network customer group ID (NETCGRPID), replace dialed digit (REPLDIGIT), ANI suppression field (SUPPRESS)*, international network class of service (INTLNCOS)*, international network ID (INTLNTID)*, or international network customer group ID (INTLNCID)*.

Note: *Indicates new field for this log.

- **INVALID DATA**—contains the corrupted value.

NSS 108—ANI invalid

This is a new log associated with this feature. It is generated at the originating node when a return error message is received back from the DBCP node. The return error message is sent when the ANI is not found in the ANIDATA DBCP database, or the ANI is datafilled as NOT_ALLOWED in the remote database.

Log NSS 108 is generated at the terminating node when a query message from the originating node results in the ANI not being found or datafilled as NOT_ALLOWED in the ANIDATA DBCP database.

AD8425

MSL changes to support DBCP ANI validation (continued)

Log NSS 106 contains the following fields:

- **CALLED ADDRESS**—For the originating node, this field identifies the SSP node where ANI lookup failure occurred. For the terminating node, this field identifies the SSP node requesting the failed ANI lookup.
- **ANI DIGITS**—the received ANI digits used to query the remote database.
- **REASON**—The specific reason that ANI lookup failure occurs can be one of the following reasons:
 - **ANI_NOT_FOUND**, which means that the ANI was either invalid or not datafilled in the ANIDATA DBCP database, or
 - **ANI_NOT_ALLOWED**, which means that the ANI was found but it was datafilled as **NOT_ALLOWED**.

NSS 109—NSS general problem

This is a new log associated with this feature. The purpose of this log is to alert users to problems with datafill and configuration without resorting to the use of SWERS. It is not specific to remote ANI validation, but is used by all the NSS TCAP applications. It is generated at either the originating or terminating node of a TCAP transaction depending on where the configuration error was detected.

Log NSS 109 contains the following fields:

- **APPLICATION**—identifies the application that is responsible for the generation of this log. Currently available applications are **NSS_TCN**, **REPL_DIGS**, and **NSS_ANI**.
- **CALLING ADDRESS**—the originating node of the TCAP transaction that caused this log to be produced.
- **CALLED ADDRESS**—the terminating node of the TCAP transaction that caused this log to be produced.
- **REASON**—the specific reason this log was produced. The following reasons could be presented:
 - **C7GTTYPE_NOT_DATAFILLED**, which means there is no entry in table **C7GTTYPE** for the specified application.
 - **C7GTTYPE_DATA_INVALID**, which means that the entry in table **C7GTTYPE** for the specified application is invalid.
 - **MORE_EXT_BLOCKS_ALLOCATED**, which means that so many transactions are being processed that the switch had to allocate more

AD8425**MSL changes to support DBCP ANI validation** (continued)

extension blocks to handle the load. This is not really an error, but simply an indication of a busy switch.

- LOCAL_SUBSYSTEM_NOT_INSV, which means that the local subsystem for the specified application is not currently in-service (INSV) or in-service trouble (ISTB).

User interface**CI and MAP test command**

This feature provides a resident test tool that is executable from both the CI prompt and a MAP level. The command, NSSANIVR, sends out an ANI remote database query using the same protocol as a call processing remote database query to assist in debugging the remote ANI validation system. The command format follows:

```
> NSSANIVR <Calling Address> <Called Address> <ANI digits>
[<Destination Digits (optional)>]
```

The format for this command when accessed from the SCCPLOC level of the map follows:

```
> TESTSS NSSANI <Calling Address> <Called Address> <ANI digits>
[<Destination Digits (optional)>]
```

The calling and called address field are the 10-digit SCCP address that are normally datafilled in a tuple of table DIALPLAN. The actual SS7 point code is given by table MSGRTE, which uses the called address to map to a SS7 point code. The ANI digits are the 3 or 10 digit ANIs that are presented in an NSSFGD call, and datafilled in table ANIDATA.

The optional destination digits field is for use with the third party destination digit replacement capabilities of this feature. If destination digits (dialed digits) are included in the NSSANIVR command, these digits are included in the outgoing ANI query message. If the result of the NSSANIVR command is a return result message (the ANI is in the remote ANI database, and is not datafilled as NOT_ALLOWED), then the new destination digits contained in the message will be displayed in the CI trace. Only the return result messages (ANI_RESPONSE, ANI_RESPONSE_ALLOW, and ANI_RESPONSE_IDDD) contain space for new destination digits, therefore for digit replacement to work, the ANI must be datafilled in table ANIDATA, and must not be set to NOT_ALLOWED.

Note: The value of the office variable NSS_DBCP_ANI_REPLACE_DR affects the results of the NSSANIVR command. If this office variable is set

AD8425**MSL changes to support DBCP ANI validation (end)**

to N, then no digit replacement occurs and the digits sent out in the query message echo in the response message. This office variable must be set to Y to allow third party digit replacement.

Office parameters

This feature defines three office parameters that are accessible within table OFCVAR. The following table expands on the explanation of these parameters:

Office Parameter	Description
NSS_DBCP_ANI_RESP_TIMEOUT	This parameter has a valid range of 1 to 10 seconds, with a default value of 3. It controls the wait time for response messages after queries have been sent out.
NSS_DBCP_ANI_BLOCK_CALL	This parameter has a valid range of Y or N, with a default value of Y. It controls whether a call should be blocked or allowed to proceed when certain network problems occur.
NSS_DBCP_ANI_REPLACE_DR	This parameter has a valid range of Y or N, with a default value of N. It controls whether the destination digits register received from the response message replaces the dialed digits register used to translate the call.

TRAVER enhancements

The TRAVER CI command is enhanced to allow for checking translations on incoming NSSFGD calls that use ANI screening with a remote ANIDATA database.

Billing

MSL Changes to Support DBCP ANI Validation does not affect billing.

AD9343**NPA FREECALL Expansion for NSS**

Functionality name

NPA FREECALL Expansion for NSS

Description

This feature removes the restriction within tables ANIDATA and REPLDATA that the middle or P digit of the NPA must be either a 0 or 1. Valid NPAs are now in the range 200-999.

In addition, this feature provides a table that allows a user to specify an NPA, and alter its behavior by specifying the NPA maps to a 700-, 800-, or 900-type call.

Table FREECALL maps specified numbering plan areas (NPAs) to 700, 800, or 900 billing characteristics. Once mapped, the specified NPAs assume the call billing characteristics of the 700-, 800-, or 900-type calls to which they are mapped.

At initial program load (IPL), tuples are datafilled in table FREECALL to provide 700, 800, and 900 billing characteristics to 400, 700, 800, and 900 NPAs. Specifically, the 400 and 800 NPAs are mapped to 800-type billing, the 700 NPA is mapped to 700-type billing, and the 900 NPA is mapped to 900-type billing.

The following example shows table FREECALL datafill immediately after IPL.

AD9343**NPA FREECALL Expansion for NSS** (continued)

```
>table FREECALL  
  
TABLE: FREECALL  
>lis all  
  
TOP  
NPA MAPTON00  
-----  
400 800  
700 700  
800 800  
900 900  
BOTTOM
```

Note: The 400 NPA will no longer be hardcoded as an 800-type NPA within NSS. Instead, the mapping of 400 to an 800-type NPA implements as a default tuple within table FREECALL.

The table control for tables ANIDATA and REPLDATA is modified to support a wider range of NPAs than are currently available. At present, the middle digit of an NPA must be a 0 or 1, resulting in a maximum of 160 datafillable NPAs. By removing this restriction, the maximum goes up to 800.

Table ANIDATA allows users to enter either three-, six-, or ten-digit ANIs. The outward appearance of the table control for this table will not be changed, other than to allow for a full range of digits in the middle position of the NPA. Table REPLDATA expects a 10-digit string as a key, indicating a called-party number to be replaced. As with ANIDATA, the outward appearance of table REPLDATA will not be changed, other than to allow a full range of digits in the middle position of the NPA.

A table on the DMS allows users to specify a set of NPAs to be treated as called-party billed calls. The name of this table is FREECALL. In addition to

AD9343**NPA FREECALL Expansion for NSS** (continued)

allowing a specific NPA to be treated as an 800 number call, NPAs can be mapped to 700- or 900-type calls as well.

Note: The FREECALL table does not perform digit replacement. Users who desire this functionality are directed to the Replace Dialed Digits feature of Network Services software.

In addition to modifying the billing behavior of the datafilled NPAs, this feature carries over any call-processing specific treatments of these NPAs by NSS, such as whether ANI validation is performed or not. In other words, within NSS, NPAs datafilled in table FREECALL take on every aspect of the N00-type NPA to which they are mapped.

Bellcore has designated 888 as a free call NPA, and similar plans are now being made for 886 and 887. In addition, NSS treats the 400 NPA as an 800 NPA, and it might be useful to designate 777 as a 700-type NPA, as well as designating 999 as a 900-type NPA.

Hardware requirements

NPA FREECALL Expansion for NSS has no hardware requirements.

Limitations and restrictions

The following limitation or restriction applies to NPA FREECALL Expansion for NSS:

- A limit of 32 possible tuples within table FREECALL has been set.

Interactions

NPA FREECALL Expansion for NSS has no functionality interactions.

Datafill

The three-part keys in tables REPLDATA and ANIDATA (the keys are identical) accommodate a full range of digits in the middle position of the NPA part of the key.

Table FREECALL allows for mapping of non-N00 NPAs to N00-type behavior with regard to billing and ANI validation.

Service orders

NPA FREECALL Expansion for NSS does not affect SERVORD.

AD9343

NPA FREECALL Expansion for NSS (continued)

Operational measurements

NPA FREECALL Expansion for NSS does not affect operational measurements.

Logs

NPA FREECALL Expansion for NSS does not affect logs.

User interface

There is a slight change in the way TRAVER performs. Incoming feature group D calls that would usually pass through a section of code that checks whether or not the NPA is 400, 700, 800, or 900, now pass through code that performs a table lookup that checks table FREECALL. This information is reflected in the TRAVER output of such a call. At the point where the lookup is performed, two lines are inserted in the traver output that indicate whether or not the call is an N00-type call. These two lines are in one of the following formats:

TABLE FREECALL

TUPLE NOT FOUND

This is displayed if the NPA field in the destination digits of the incoming call is not datafilled in table FREECALL (if the NPA is a regular NPA and not set up to be an N00-type NPA).

One of the following is displayed if the NPA field in the destination digits of the incoming call is datafilled in table FREECALL as being mapped to one of the N00-type calls:

TABLE FREECALL

NPA XXX maps to a 700-type number

..... or

TABLE FREECALL

NPA XXX maps to a 800-type number

..... or

TABLE FREECALL

AD9343

NPA FREECALL Expansion for NSS (end)

NPA XXX maps to a 900-type number

Billing

Billing records for 800-type calls will be produced for any NPAs datafilled in table FREECALL as mapping to an 800 behavior. Also, 700- and 900-type billing records are produced for NPAs datafilled in table FREECALL as mapping to 700 or 900 behavior.

AD9693

CCM: Trunk Member Display

Functionality name

CCM: Trunk Member Display

Description

This feature displays the name of the Common Language Location Identifier (CLLI) and circuit member number of the trunk to the user of a Meridian business set (MBS) or integrated voice and data (IVD) set.

The TRKDISP feature is active and displays the CLLI and circuit member number of the trunk to which it is connected when the Trunk Member Display (TRKDISP) key is pressed. When the TRKDISP key is pressed a second time, the feature updates the set with the previous display and cancels the feature.

The SERVORD tool is used to datafill this feature. This feature is capable of displaying the trunk data from any trunk type.

Accompanying feature

This feature works in conjunction with feature AD9706, XPM: Trunk Member Display.

Hardware requirements

CCM: Trunk Member Display has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to CCM: Trunk Member Display:

- This feature cannot be assigned to any softkeys.
- This feature is not compatible with any CLASS sets or features.
- This feature does not apply to the attendant console.
- This feature is not compatible with Integrated Services Digital Network (ISDN) type sets.
- This feature and any Three-way Call (3WC) or conference feature cannot be simultaneously active.
- The Display option cannot be deleted before the TRKDISP option.

Interactions

The following paragraphs describe the interactions between CCM: Trunk Member Display and other functionalities.

AD9693**CCM: Trunk Member Display** (end)

This feature interacts with the information that is displayed on the set before the TRKDISP feature is activated.

Datafill

A new feature, TRKDISP, is introduced in table KSETFEAT.

Service orders

TRKDISP is a new line option for this feature.

This feature is verified by using the following commands:

- QLEN
- QDN
- QLENWRK
- QDNWRK

Operational measurements

CCM: Trunk Member Display does not affect operational measurements.

Logs

CCM: Trunk Member Display does not affect logs.

User interface

CCM: Trunk Member Display does not change the user interface.

Billing

CCM: Trunk Member Display does not affect billing.

AD9694

Call Forward Indication

Functionality name

Call Forward Indication

Description

This feature provides users with 500/2500 set types an audible notification that their phone is still manually forwarded. After the tone is heard, the set receives dial tone. Because users may not know that their phone has been forwarded, calls can mistakenly be forwarded to another number while the user is at his or her desk.

The Call Forward Indication (CFIND) feature is datafilled using SERVORD. The service representative specifies the audible tone from table STN.

Hardware requirements

Call Forward Indication has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Call Forward Indication:

- Supports 500/2500 integrated business network (IBN) sets and Residential (RES line class code) sets.
- Supports IBN sets that have the Call Forward Universal (CFU) or Call Forward Intragroup (CFI) options assigned to them.
- Supports CFW for RES sets.
- The set must be manually forwarded before the Call Forward Indication feature is considered active.
- Does not support Automatic Lines (AUL), Call Forward Busy (CFB) and Call Forward Don't Answer (CFD).
- The tone ANSPD may not be used for CFIND.

Interactions

Call Forward Indication has no functionality interactions. The implementation of this feature occurs before dial tone. Therefore, Message Waiting and other features which use stuttered dial tones are not affected.

Datafill

Table LCCOPT is modified by the use of an EXT file to allow the CFIND option to be datafilled to IBN and RES sets. Table OPTOPT is datafilled so that AUL, CFD and CFB are incompatible with CFIND.

AD9694

Call Forward Indication (end)

Service orders

Service orders are modified so that the CFIND options may be datafilled. The service representative has the option of assigning the call forward indication method to be any tone currently datafilled in table STN.

The Query Line Equipment Number (QLEN) and the Query Directory Number (QDN) commands are modified so that when a 500/2500 set is queried by its line equipment number (LEN) or directory number (DN), the CFIND option, along with the notification tone, is shown.

Operational measurements

Call Forward Indication does not affect operational measurements.

Logs

Call Forward Indication does not affect logs.

User interface

Call Forward Indication does not change the user interface.

Billing

Call Forward Indication does not affect billing.

AD9695

CCM: Automated Datafill for IPE Line Cards

Functionality name

CCM: Automated Datafill for IPE Line Cards

Description

This feature, along with feature AD9718, MSL: Automated Datafill and Resource Allocation for the IPE, allows the MSL-100 system to poll the intelligent peripheral equipment (IPE) line card and dynamically datafill the line card information into table LNINV. This capability allows MSL-100 users to make immediate upgrades of existing card types for the IPE without software intervention.

This automatic datafill procedure provides the following benefits:

- Minimal software patches are needed.
- Accurate and up-to-date product inventory is provided on user's switch.
- Support can accurately identify and resolve field problems.
- Minimizes human error.

Currently, a feature activity must be opened for any new version of line card that must be datafilled in table LNINV for the IPE. If table LNINV is not updated with the new product code of the line card, the current software does not allow the activation of that product.

Automated datafill is a plug and play design. It allows automatic datafill of a line card's product engineering code (PEC) in table LNINV and maps proper test and diagnostic procedures to the line card.

To accomplish this functionality, the automated datafill operation is concerned primarily with polling cards within the IPE, creating a table for compatible cards, and binding diagnostic routines for compatible cards. The new table containing the compatible cards is considered the kernel of this feature. Information taken from it provides the data needed to properly automate the process of datafilling the IPE's line cards.

The Automated Datafill for IPE Line Cards feature assumes that new line card version code is one of the following types:

- 8D02, digital line card
- 8D03, analog line card

AD9695**CCM: Automated Datafill for IPE Line Cards** (continued)

- 8D09, analog/message waiting line card
- 5D11, line side T1

Accompanying features

This feature works in conjunction with the following features:

- AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.
- AD9724, IPE: Automated Datafill and Resource Allocation for the IPE.

Hardware requirements

CCM: Automated Datafill for IPE Line Cards supports the following hardware:

- 8D02, digital line card
- 8D03, analog line card
- 8D09, analog/message waiting line card
- 5D11, line side T1

Limitations and restrictions

The CCM: Automated Datafill for IPE Line Cards feature applies only to IPE.

Interactions

CCM: Automated Datafill for IPE Line Cards impacts system operations with table LNINV, line card maintenance, and diagnostics functions for the IPE.

Datafill

CCM: Automated Datafill for IPE Line Cards does not affect data schema tables or office parameters. New data schema is created by feature AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.

Service orders

CCM: Automated Datafill for IPE Line Cards does not affect SERVORD.

Operational measurements

CCM: Automated Datafill for IPE Line Cards does not affect operational measurements.

AD9695

CCM: Automated Datafill for IPE Line Cards (end)

Logs

CCM: Automated Datafill for IPE Line Cards does not affect Logs. New logs are created by feature AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.

User interface

CCM: Automated Datafill for IPE Line Cards does not change the user interface.

Billing

CCM: Automated Datafill for IPE Line Cards does not affect billing.

AD9697
CCM: NAS RLT Enhancements

Functionality name

CCM: NAS RLT Enhancements

Description

This feature decreases the number of trunking facilities required when the attendant services are consolidated at one node for two or more nodes in the network. This is accomplished by bridging the call at an MSL-100 node where the call was routed to the centralized attendant.

This feature enhances Network Attendant Services Release Link Trunk (NAS RLT) by allowing a bridged call to recall the attendant once the call has been released.

The bridged call attendant call allows the NAS RLT call to be recalled to the centralized attendant in the event that the call is not answered by the far end.

The originator of a NAS RLT ends up at the centralized console. The attendant then activates NAS RLT. Upon attendant release of a successfully bridged call, a recall timer is set to expire on the originator. If the far end does not answer before the timer expires, the call recalls to the attendant console subgroup that bridged the call.

Accompanying feature

This feature works in conjunction with feature AD9714, MSL: NAS RLT Enhancements.

Hardware requirements

CCM: NAS RLT Enhancements requires the Meridian Services Attendant Console (MSAC), NT409BB.

Limitations and restrictions

CCM: NAS RLT Enhancements has no limitations or restrictions. Refer to features AD3285, NAS RLT IBN ISUP Trunk Interactions, AD3286, NAS RLT AC Special Function Key, and AD3287, NAS RLT Table Control and ISUP Messaging for additional limitations or restrictions on NAS RLT functionality.

Interactions

CCM: NAS RLT Enhancements has no functionality interactions. Refer to features AD3285, NAS RLT IBN ISUP Trunk Interactions, AD3286, NAS

AD9697

CCM: NAS RLT Enhancements (end)

RLT AC Special Function Key, and AD3287, NAS RLT Table Control and ISUP Messaging for additional interactions on NAS RLT functionality.

Datafill

CCM: NAS RLT Enhancements does not affect data schema tables or office parameters.

Service orders

CCM: NAS RLT Enhancements does not affect SERVORD.

Operational measurements

CCM: NAS RLT Enhancements does not affect operational measurements.

Logs

CCM: NAS RLT Enhancements does not affect logs.

User interface

CCM: NAS RLT Enhancements does not change the user interface.

Billing

CCM: NAS RLT Enhancements does not affect billing.

AD9698**CCM: CFB/CFD Per Key Destination**

Functionality name

CCM: CFB/CFD Per Key Destination

Description

This feature allows the user to assign different forwarding directory numbers (DN) to the keys specified in the KEYLIST of the Call Forward Busy/Call Forward Don't Answer (CFB/CFD) feature. This is accomplished by adding a new control type in the KEYLIST field. This feature supports Meridian business sets (MBS), integrated voice and data (IVD) sets, and Integrated Services Digital Network (ISDN) sets.

To activate the feature, the switch administrator selects K for the CFB/CFD Per Key Control Field and specifies what DN keys he wants the feature active on in the KEYLIST. After the user of the set enters which keys he would like the feature on, he programs the forwarding DN as he would for the Programmable Control Option.

This feature does not affect how the current CFB/CFD normal, fixed, and programmable control options work.

The control type, K, works with the office parameter CFX_SEPARATE_KEYLIST_FEATURE, found in table OFCENG. The office parameter can be set to Y or N.

The CFB/CFD-Internal/External feature supports the new control type of K.

Accompanying features

The following features work in conjunction with this feature:

- AD9702, CNA: CFB/CFD Per Key Destination
- AD9720, MSL: CFB/CFD Per Key Destination

Hardware requirements

CCM: CFB/CFD Per Key Destination has no hardware requirements.

AD9698

CCM: CFB/CFD Per Key Destination (end)

Limitations and restrictions

The following limitations and restrictions apply to CCM: CFB/CFD Per Key Destination:

- This feature is assigned to the primary DN key of a set and has a maximum of 24 DN keys that can be specified in the KEYLIST.
- FTRGRPS and the residential varieties of CFB/CFD (CFBL/CFDA) do not support the CFB/CFD Per Key types.

Interactions

CCM: CFB/CFD Per Key Destination has no functionality interactions.

Datafill

CCM: CFB/CFD Per Key Destination affects data schema tables and office parameters in the following way. There is a change to the way in which tuples are displayed in table CFX. When the control type is set to K, a tuple is displayed for every key that is entered in the KEYLIST field.

Service orders

CCM: CFB/CFD Per Key Destination does not affect SERVORD but a new CFB/CFD control option type is added. The switch administrator enters a K to select the CFB/CFD Per Key feature as the Control Type in SERVORD.

Operational measurements

CCM: CFB/CFD Per Key Destination does not affect operational measurements.

Logs

CCM: CFB/CFD Per Key Destination does not affect logs.

User interface

CCM: CFB/CFD Per Key Destination does not change the user interface.

Billing

CCM: CFB/CFD Per Key Destination does not affect billing.

AD9699**LINE 117/125 Log Enhancements****Functionality name**

LINE 117/125 Log Enhancements

Description

This feature enhances the LINE117 and LINE125 logs and provides identification information of the calling party.

The LINE117 and LINE125 logs are modified to provide the directory number (DN) of the calling party. If the DN of the calling party is not available and a charge number is found, then the charge number is displayed for the calling party. If both the DN and charge number for the calling party are unavailable, then no DN is provided. The source of the DN is identified (calling number, charge number, or unavailable).

In addition to LINE117 and LINE125 logs, LINE115 and LINE126 logs are related to this enhancement. The following table describes these logs.

Line logs (115, 117, 125 and 126)

Log	Description
LINE115	A call originating from another line connected to the switch terminates to a line with the calling line identification (CLI) service order option.
LINE117	A call originating from a trunk connected to the switch terminates to a line with the CLI service order option.
LINE125	A call originating from a trunk connected to the switch terminates to a line with the calling line flash-hook (CLF) service order option, and the hookswitch is flashed.
LINE126	A malicious call originates from another line connected to the switch with the CLF option and a flash is done from this line (the malicious call trace feature is activated).

The implementation of logs LINE115 and LINE126 provides the following:

- terminating Line Equipment (LEN) and DN
- originating LEN and DN

AD9699

LINE 117/125 Log Enhancements (continued)

- CALLID
- time (LINE115 only)

The existing implementation of logs LINE117 and LINE125 provides the following:

- terminating LEN and DN
- incoming trunk identifier consisting of a Common Language Location Identifier (CLLI) and circuit number
- CALLID
- time (LINE117 only)

SOC options

Feature AX0923, CCM: SOC for LINE 117 and LINE 125 Enhancements, provides a software optionality control (SOC) to control the availability of calling party information. Refer to feature AX0923 for more information.

Hardware requirements

LINE 117/125 Log Enhancements has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to LINE 117/125 Log Enhancements:

- The availability of the DN or charge number of the calling party is dependent upon its being passed to the terminating nodes.
- Trunks using common channel signaling system 7 (CCS7) or primary rate interface (PRI) signaling should pass either the DN or the charge number of the calling party. Trunks which deliver automatic number identification (ANI) should also pass either the DN or the charge number of the calling party.

Interactions

LINE 117/125 Log Enhancements has no functionality interactions.

Datafill

LINE 117/125 Log Enhancements does not affect data schema tables or office parameters.

AD9699

LINE 117/125 Log Enhancements (continued)

Service orders

LINE 117/125 Log Enhancements does not affect SERVORD.

Operational measurements

LINE 117/125 Log Enhancements does not affect operational measurements.

Logs

An example of the new LINE117 and LINE125 logs follows.

AD9699

LINE 117/125 Log Enhancements (end)

Example of new LINE117 and LINE125 logs

```
NEWLINELOGS * LINE117 OCT29 11:10:39 5800 INFO CALLING LINE IDENT
LEN LCM1 00 1 09 31 DN 9975056 KEY 1
INCOMING TRUNK = CKT RCHTORTPPTS 0
CALLID        = 360467
TIME: OCT29 11:10:39
CALLING NUMBER = 2149975015
SOURCE        = CALLING NUMBER

NEWLINELOGS * LINE125 OCT29 11:11:37 8000 INFO TRACE_ON_MALICIOUS_CALL_IN
LEN RLCM 00 0 10 00 DN 9975002
INCOMING TRUNK = CKT RCHTORTPPTS 1
CALLID        = 360459
CALLING NUMBER = 2149975015
SOURCE        = CALLING NUMBER

NEWLINELOGS * LINE117 OCT29 11:12:41 5800 INFO CALLING LINE IDENT
LEN LCM1 00 1 09 31 DN 9975056 KEY 1
INCOMING TRUNK = CKT RCHTORTPPTS 0
CALLID        = 360522
TIME: OCT29 11:12:41
CALLING NUMBER = 2149975015
SOURCE        = CHARGE NUMBER

NEWLINELOGS * LINE117 OCT29 11:15:07 5800 INFO CALLING LINE IDENT
LEN LCM1 00 1 09 31 DN 9975056 KEY 1
INCOMING TRUNK = CKT RCHTORTPPTS 0
CALLID        = 360456
TIME: OCT29 11:15:07
CALLING NUMBER =
SOURCE        = UNAVAILABLE
```

User interface

LINE 117/125 Log Enhancements does not change the user interface.

Billing

LINE 117/125 Log Enhancements does not affect billing.

AD9701
CNA: M2616CT & ATA Support

Functionality name

CNA: M2616CT & ATA Support

Description

This feature allows the system software to recognize and configure two additional terminal types. The first terminal, M2616CT, is a cordless version of the existing M2616 terminal and has the same interface and control into the MSL-100 system. The second terminal type, analog terminal adapter (ATA), adds an analog port to a digital terminal. The ATA fits into the base of the models M2006, M2008, M2008HF, M2216, M2616, and M2616CT phone sets and saves desktop space. The ATA has the same interface and control into the MSL-100 as the existing M2006. The ATA is datafillable on the odd line equipment number (LEN) of a digital link module/intelligent peripheral equipment (DLM/IPE). Whereas the M2006 phone set along with all other voice sets, is only datafillable on the even LEN of a DLM/IPE.

These two additional terminal types are configured in the computing module (CM). The line group controller (LGC), line trunk controller (LTC), remote cluster controller (RCC), SONET remote cluster controller (RCC2) extended peripheral modules (XPM) that exist between the CM and the terminals handle these two additional terminal types as messages. The messages pass to and from the CM and the terminals. All messages transferred between the XPM and the M2616CT phone and ATA are routed through an IPE or DLM circuit card. This feature identifies the definitions required within a host XPM for the additional terminals. It also allows the terminals to be datafillable using SERVORD with separate line class codes (LCC).

Accompanying features

The following features work in conjunction with this feature:

- AD9708, XPM: M2616CT & ATA Support
- AD9711, TL: M2616CT & ATA Support
- AD9719, MSL: M2616CT & ATA Support
- AD9753, CCM: M2616CT & ATA Support

AD9701

CNA: M2616CT & ATA Support (end)

Hardware requirements

This feature works on the MSL-100 LGC or LTC XPM module interfacing with an M2616 cordless telephone (M2616CT) or an ATA. The following hardware components are associated with this feature:

- MSL-100 switch elements (CM, MS, Network)
- host XPM (LGC/LTC/RCC/RCC2)
- IPE/DLM
- M2616CT or other sets (M2006, M2008, M2008HF, M2216, M2616) containing the ATA terminal in their base

Limitations and restrictions

CNA: M2616CT & ATA Support has no limitations or restrictions.

Interactions

All configurations of a DLM/IPE work, including with a DS30 interface card or a fiber interface card.

Datafill

CNA: M2616CT & ATA Support does not affect data schema tables or office parameters.

Service orders

CNA: M2616CT & ATA Support does not affect SERVORD.

Operational measurements

CNA: M2616CT & ATA Support does not affect operational measurements.

Logs

CNA: M2616CT & ATA Support does not affect logs.

User interface

CNA: M2616CT & ATA Support does not change the user interface.

Billing

CNA: M2616CT & ATA Support does not affect billing.

AD9702**CNA: CFB/CFD Per Key Destination**

Functionality name

CNA: CFB/CFD Per Key Destination

Description

This feature allows the user to assign different forwarding directory numbers (DN) to the keys specified in the KEYLIST of the Call Forward Busy/Call Forward Don't Answer (CFB/CFD) feature. This feature supports Meridian business sets (MBS), integrated voice and data (IVD) sets, and Integrated Services Digital Network (ISDN) sets.

To activate the feature, the switch administrator selects K for the CFB/CFD Per Key Control Field and specifies which DN keys he wants the feature active on in the KEYLIST. After the user of the set enters which keys he would like the feature on, he programs the forwarding DN as he would for the Programmable Control Option.

The changes specific to the CNA layer involve supporting the COPYSET command and the Call Screening, Monitoring, Intercept (CSMI) feature. The COPYSET command and the CFB/CFD-Internal/External feature support the control type K.

This feature does not affect how the current CFB/CFD normal, fixed, and programmable control options work.

The control type, K, works with the office parameter CFX_SEPARATE_KEYLIST_FEATURE, found in table OFCENG. The office parameter can be set to Y or N.

Accompanying features

The following features work in conjunction with this feature:

- AD9698, CCM: CFB/CFD Per Key Destination
- AD9720, MSL: CFB/CFD Per Key Destination

Hardware requirements

CNA: CFB/CFD Per Key Destination has no hardware requirements.

AD9702

CNA: CFB/CFD Per Key Destination (end)

Limitations and restrictions

The following limitations and restrictions apply to CNA: CFB/CFD Per Key Destination:

- This feature is assigned to the primary DN key of a set and has a maximum of 24 DN keys that can be specified in the KEYLIST.
- FTRGRPS and the residential varieties of CFB/CFD (CFBL/CFDA) do not support the CFB/CFD Per Key types.
- CSMI only works for calls forwarded from the primary DN. CSMI only functions for Per Key from the primary DN.

Interactions

CNA: CFB/CFD Per Key Destination has no functionality interactions.

Datafill

CNA: CFB/CFD Per Key Destination does not affect data schema tables or office parameters.

Service orders

The SERVORD COPYSET command supports the control type, K.

Operational measurements

CNA: CFB/CFD Per Key Destination does not affect operational measurements.

Logs

CNA: CFB/CFD Per Key Destination does not affect logs.

User interface

CNA: CFB/CFD Per Key Destination does not change the user interface.

Billing

CNA: CFB/CFD Per Key Destination does not affect billing.

AD9706**XPM: Trunk Member Display**

Functionality name

XPM: Trunk Member Display

Description

This feature displays the name of the Common Language Location Identifier (CLLI) and circuit member number of the trunk to the user of a Meridian business set (MBS) or integrated voice and data (IVD) set.

The TRKDISP feature is active and displays the CLLI and circuit member number of the trunk to which it is connected when the Trunk Member Display (TRKDISP) key is pressed. When the TRKDISP key is pressed a second time, the feature updates the set with the previous display and cancels the feature.

The SERVORD tool is used to datafill this feature. This feature is capable of displaying the trunk data from any trunk type.

Overview of TRKDISP key in XPM

A TRKDISP key stroke turns on the TRKDISP key lamp and clears the display. After the TRKDISP key is pressed, the XPM sends a message to the computing module (CM) to initiate the TRKDISP function. This message indicates to the CM that the TRKDISP key was pressed and sends a FEATURE_MSG to the CM specifying the activation of the feature. The CM responds with a message containing the display information. When the TRKDISP key is pressed a second time, the TRKDISP key lamp is turned off and the display is updated with the previous display.

Accompanying feature

This feature works in conjunction with feature AD9693, CCM: Trunk Member Display.

Hardware requirements

XPM: Trunk Member Display has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to XPM: Trunk Member Display:

- This feature cannot be assigned to any softkeys.
- This feature is not compatible with any CLASS sets or features.
- This feature does not apply to the attendant console.

AD9706

XPM: Trunk Member Display (end)

- This feature is not compatible with Integrated Services Digital Network (ISDN) type sets.
- This feature and any Three-way Conference (3WC) or conference feature cannot be simultaneously active.
- The Display option (DISP/M0200) cannot be deleted before the TRKDISP option. The TRKDISP option cannot be added without the DISP/M0200 option already datafilled.
- This feature is not compatible with 500/2500 sets.

Interactions

The following paragraphs describe the interactions between XPM: Trunk Member Display and other functionalities.

This feature interacts with the information that is displayed on the set before the TRKDISP feature is activated.

Datafill

XPM: Trunk Member Display does not affect data schema tables or office parameters.

Service orders

XPM: Trunk Member Display does not affect SERVORD.

Operational measurements

XPM: Trunk Member Display does not affect operational measurements.

Logs

XPM: Trunk Member Display does not affect logs.

User interface

XPM: Trunk Member Display does not change the user interface.

Billing

XPM: Trunk Member Display does not affect billing.

AD9708**XPM: M2616CT & ATA Support****Functionality name**

XPM: M2616CT & ATA Support

Description

This feature allows the system software to recognize and configure two additional terminal types. The first terminal, M2616CT, is a cordless version of the existing M2616 terminal and has the same interface and control into the MSL-100 system. The second terminal type, analog terminal adapter (ATA), adds an analog port to a digital terminal. The ATA fits into the base of the models M2006, M2008, M2008HF, M2216, M2616, and M2616CT phone sets and saves desktop space. The ATA has the same interface and control into the MSL-100 system as the existing M2006 phone set. The ATA is datafillable on the odd line equipment number (LEN) of a digital link module/intelligent peripheral equipment (DLM/IPE). Whereas the M2006 phone set along with all other voice sets, is only datafillable on the even LEN of a DLM/IPE.

These two additional terminal types are configured in the computing module (CM). The line group controller (LGC), link trunk controller (LTC), remote cluster controller (RCC), SONET remote cluster controller (RCC2) extended peripheral modules (XPM) which exist between the CM and the terminals handle these two additional terminal types as messages. The messages pass to and from the CM and the terminals. All messages transferred between the XPM and the M2616CT and ATA are routed through an IPE or DLM circuit card. This feature identifies the definitions required within a host XPM for the additional terminals. It also allows the terminals to be datafillable using SERVORD with separate line class codes (LCC).

Accompanying features

The following features work in conjunction with this feature:

- AD9701, CNA: M2616CT & ATA Support
- AD9711, TL: M2616CT & ATA Support
- AD9719, MSL: M2616CT & ATA Support
- AD9753, CCM: M2616CT & ATA Support

AD9708

XPM: M2616CT & ATA Support (end)

Hardware requirements

This feature works on the MSL-100 LGC or LTC XPM module interfacing with an M2616 cordless telephone (M2616CT) or an ATA. The following hardware components are associated with this feature:

- MSL-100 switch elements (CM, MS, Network)
- host XPM (LGC/LTC/RCC/RCC2)
- IPE/DLM
- M2616CT or other sets (M2006, M2008, M2008HF, M2216, M2616) containing the ATA terminal in their base

Limitations and restrictions

XPM: M2616CT & ATA Support has no limitations or restrictions.

Interactions

XPM: M2616CT & ATA Support has no functionality interactions.

Datafill

XPM: M2616CT & ATA Support does not affect data schema tables or office parameters.

Service orders

XPM: M2616CT & ATA Support does not affect SERVORD. See feature AD9753, CCM: M2616CT & ATA Support, for SERVORD activity.

Operational measurements

XPM: M2616CT & ATA Support does not affect operational measurements.

Logs

XPM: M2616CT & ATA Support does not affect logs.

User interface

XPM: M2616CT & ATA Support does not change the user interface.

Billing

XPM: M2616CT & ATA Support does not affect billing.

AD9711**TL: M2616CT & ATA Support**

Functionality name

TL: M2616CT & ATA Support

Description

This feature allows the system software to recognize and configure two additional terminal types. The first terminal, M2616CT, is a cordless version of the existing M2616 terminal and has the same interface and control into the MSL-100 system. The second terminal type, analog terminal adapter (ATA), adds an analog port to a digital terminal. The ATA fits into the base of the models M2006, M2008, M2008HF, M2216, M2616, and M2616CT phone sets and saves desktop space. The ATA has the same interface and control into the MSL-100 system as the existing M2006 phone set. The ATA is datafillable on the odd line equipment number (LEN) of a digital link module/intelligent peripheral equipment (DLM/IPE). Whereas the M2006 phone set along with all other voice sets, is only datafillable on the even LEN of a DLM/IPE.

These two additional terminal types are configured in the computing module (CM). The line group controller (LGC), line trunk controller (LTC), remote cluster controller (RCC), SONET remote cluster controller (RCC2) extended peripheral modules (XPM) which exist between the CM and the terminals handle these two additional terminal types as messages. The messages pass to and from the CM and the terminals. All messages transferred between the XPM and the M2616CT and ATA are routed through an IPE or DLM circuit card. This feature identifies the definitions required within a host XPM for the additional terminals. It also allows the terminals to be datafillable using SERVORD with separate line class codes (LCC).

Accompanying features

The following features work in conjunction with this feature:

- AD9701, CNA: M2616CT & ATA Support
- AD9708, XPM: M2616CT & ATA Support
- AD9719, MSL: M2616CT & ATA Support
- AD9753, CCM: M2616CT & ATA Support

AD9711

TL: M2616CT & ATA Support (end)

Hardware requirements

This feature works on the MSL-100 LGC or LTC XPM module interfacing with an M2616 cordless telephone (M2616CT) or an ATA. The following hardware components are associated with this feature:

- MSL-100 switch elements (CM, MS, Network)
- host XPM (LGC/LTC/RCC/RCC2)
- IPE/DLM
- M2616CT or other sets (M2006, M2008, M2008HF, M2216, M2616) containing the ATA terminal in their base

Limitations and restrictions

TL: M2616CT & ATA Support has no limitations or restrictions.

Interactions

TL: M2616CT & ATA Support has no functionality interactions.

Datafill

TL: M2616CT & ATA Support does not affect data schema tables or office parameters.

Service orders

TL: M2616CT & ATA Support does not affect SERVORD. See feature AD9753, CCM: M2616CT & ATA Support, for information of SERVORD activity.

Operational measurements

TL: M2616CT & ATA Support does not affect operational measurements.

Logs

TL: M2616CT & ATA Support does not affect logs.

User interface

TL: M2616CT & ATA Support does not change the user interface.

Billing

TL: M2616CT & ATA Support does not affect billing.

AD9714**MSL: NAS RLT Enhancements****Functionality name**

MSL: NAS RLT Enhancements

Description

This feature decreases the number of trunking facilities required when the attendant services are consolidated at one node for two or more nodes in the network. This is accomplished by bridging the call at an MSL-100 node where the call is routed to the centralized attendant.

This feature enhances Network Attendant Services Release Link Trunk (NAS RLT) by adding the following:

- A bridged call can recall to the attendant once the call has been released.
- A new log report is generated whenever a facility reject message (FRJ) is created by the far end.

The originator of a NAS RLT ends up at the centralized console. The attendant then activates NAS RLT (for example, Manual NAS RLT). Upon attendant release of a successfully bridged call, a recall timer is set to expire on the originator. If the far end does not answer before the timer expires, the call recalls to the attendant console subgroup that bridged the call.

The following table describes the recall scenarios for manual and automatic NAS RLT.

xNAS RLT recall scenarios

Originator	Automatic NAS RLT	Manual NAS RLT
Line	Recall	Recall
SS7 trunk	Recall	Recall
PRI trunk	Recall	No recall
PTS trunk	Recall	Recall

Accompanying feature

This feature works in conjunction with feature AD9697, CCM: NAS RLT Enhancements.

AD9714

MSL: NAS RLT Enhancements (continued)

Hardware requirements

MSL: NAS RLT Enhancements requires the Meridian Services Attendant Console (MSAC), NT409BB.

Limitations and restrictions

MSL: NAS RLT Enhancements has no limitations or restrictions. Refer to features AD3285, NAS RLT IBN ISUP Trunk Interactions, AD3286, NAS RLT AC Special Function Key, and AD3287, NAS RLT Table Control and ISUP Messaging for additional limitations or restrictions on NAS RLT functionality.

Interactions

MSL: NAS RLT Enhancements has no functionality interactions. Refer to features AD3285, NAS RLT IBN ISUP Trunk Interactions, AD3286, NAS RLT AC Special Function Key, and AD3287, NAS RLT Table Control and ISUP Messaging for additional interactions on NAS RLT functionality.

Datafill

MSL: NAS RLT Enhancements does not affect data schema tables or office parameters.

Service orders

MSL: NAS RLT Enhancements does not affect SERVORD.

Operational measurements

MSL: NAS RLT Enhancements does not affect operational measurements.

Logs

A new log report, NRLT104, is created when the NAS RLT receives an FRJ with a cause indicator of CI_CALL_RETURNS.

The report is generated when one of the following conditions occur at the centralized attendant.

- The NAS RLT originator has another feature active (for example, 3-way calling).
- The originator is an attendant (attendant is attached).

AD9714

MSL: NAS RLT Enhancements (end)

- The NAS RLT terminator has another feature active (for example, 3-way calling).
- The terminator is an attendant (second call is an attendant).

Example log

```
MMSLDSNX06CB  NRLT104 JAN24 14:22:53 7500 INFO NAS RLT  
PROBLEM: NAS RLT bridging rejected by far end  
CALLID: 983066
```

User interface

MSL: NAS RLT Enhancements does not change the user interface.

Billing

MSL: NAS RLT Enhancements does not affect billing.

AD9716

Answer Supervision Throttling for DID Calls

Functionality name

Answer Supervision Throttling for DID Calls

Description

This feature disables the capabilities of AD4550, FCC DID Answer Supervision Compliance. FCC DID Answer Supervision Compliance applies answer supervision to all Per Trunk Signaling (PTS) trunks in an office that must return answer supervision to the central office on specific calls. An office is any place of business, university, or location that has an MSL-100. This feature provides the Federal Communications Commission (FCC) requirements which protect against fraudulent billing.

Answer Supervision Throttling for DID Calls deactivates answer supervision for offices that are exempted from the FCC ruling.

The use of this feature is controlled by the software optionality control (SOC) utility. This utility controls the secure activation or use of options in a Product Computing-Module Load (PCL). At initial program load (IPL), the features which comprise the option in the PCL register their SOC information (feature name, state or usage support procedures) with the SOC utility. When a user requests an option state change or a usage limit change using the SOC interface, the SOC utility controls the activation or deactivation or usage of the optional software.

Hardware requirements

Answer Supervision Throttling for DID Calls has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Answer Supervision Throttling for DID Calls:

- Applies only to PTS trunks.
- Answer Supervision is active when delivered and after a one night process (ONP) unless the user had answer supervision previously turned off.

Interactions

Answer Supervision Throttling for DID Calls has no functionality interactions.

Datafill

Answer Supervision Throttling for DID Calls does not affect data schema tables or office parameters.

AD9716**Answer Supervision Throttling for DID Calls (end)**

Service orders

Answer Supervision Throttling for DID Calls does not affect SERVORD.

Operational measurements

Answer Supervision Throttling for DID Calls does not affect operational measurements.

Logs

Answer Supervision Throttling for DID Calls does not affect logs.

User interface

The following information provides an overview of the SOC functionality for Answer Supervision Throttling for DID Calls.

The option name is called MSL Disable Ans Sup and its order code is MSL00111.

The SOC state-controlled option is used to control the answer supervision. The SOC state is either soc_on or soc_idle. When this option is in the soc_idle state, answer supervision is active. When this option is in the soc_on state, answer supervision is deactivated. The default for this feature is soc_idle.

The feature is delivered to the user's site in the soc_idle state. If the site is exempt from the FCC regulation, then it has the option of leaving soc_idle on, or changing it with a keycode to soc_on. The state behavior is determined by the state of the software before an ONP. If answer supervision is on before an ONP, then after completion of the ONP it is in the same state. This is controlled by the sensing software on the switch.

Billing

Answer Supervision Throttling for DID Calls does not affect billing.

AD9718

MSL: Automated Datafill and Resource Allocation for the IPE

Functionality name

MSL: Automated Datafill and Resource Allocation for the IPE

Description

This feature includes two functions for the intelligent peripheral equipment (IPE):

- ringing resource allocation
- automated datafill for IPE line cards

Ringing resource allocation

Ringing resource allocation exploits the full capability of the IPE's ringing generator. Currently there are three types of ringing generators available for IPE use, NT6D42, NT8D21, and NT7D03. Each ringing generator supports simultaneously ringing analog sets. NT6D42 supports 16; NT7D03 and NT8D21 support eight.

This feature makes more efficient use of ringing resources within the IPE. Due to hardware limitations of ringing generators for analog phone sets, concurrent ringing can only be supplied to a limited number of phones without physically damaging the ringing generators.

Table control is used to differentiate between ringing generators. The IPE now only recognizes the ringing generator that can ring eight phones. The throttling that the IPE currently uses is based on the actual ringing generator and notification is sent to the IPE setting its maximum ringing resource (MRR). The MRR value is set by executing either the RTS or QUERYPM command. In order to trace resource inadequacies for phones needing the resource, but failing to get it, a log is produced indicating this failure. Additionally, an operational measurement is pegged to keep statistics.

Automated datafill for IPE line cards

This feature allows the MSL-100 system to poll the IPE line card and dynamically datafill the line card information into table LNINV. This capability allows MSL-100 users to make immediate upgrades of existing card types for the IPE without software intervention.

This automatic datafill procedure provides the following benefits:

- Minimal software patches are needed
- Accurate and up-to-date product inventory is provided on the user's switch

AD9718**MSL: Automated Datafill and Resource Allocation for the IPE**

- Support can accurately identify and resolve field problems
- Minimizes human error

Currently, a feature activity must be opened for any new version of line card that must be datafilled in table LNINV for the IPE. If table LNINV is not updated with the new product code of the line card, the current software does not allow the activation of that product.

Automated datafill is a plug and play design. It allows automatic datafill of a line card's product engineering code (PEC) in table LNINV and maps proper test and diagnostic procedures to the line card.

To accomplish this functionality, the automated datafill operation of this feature is concerned primarily with polling cards within the IPE, creating a table for compatible cards, and binding diagnostic routines for compatible cards. The new table containing the compatible cards is considered the kernel of this feature. Information taken from it provides the data needed to properly automate the process of datafilling the IPE's line cards.

The automated datafill for IPE line cards assumes that new line card version codes will be one of the following types:

- 8D02, digital line card
- 8D03, analog line card
- 8D09, analog/message waiting line card
- 5D11, line side T1

Accompanying features

This feature works in conjunction with the following features:

- AD9695, CCM: Automated Datafill for IPE Line Cards.
- AD9724, IPE: Automated Datafill and Resource Allocation for the IPE.

Hardware requirements

MSL: Automated Datafill and Resource Allocation has the following hardware requirements:

- MSL-100 Enhanced Core/SuperNode Small Edition (ECORE/SNSE) switch
- line group controller (LGC), line trunk controller (LTC), or remote cluster controller (RCC) peripheral module

AD9718

MSL: Automated Datafill and Resource Allocation for the IPE

- IPE peripheral module
- NT5D11, NT8D02, NT8D03, or NT8D09 line cards
- ringing generators NT6D42, NT8D21, or NT7D03

Limitations and restrictions

MSL: Automated Datafill and Resource Allocation for the IPE only supports the following card types:

- NT8D02, digital line card (XDLC)
- NT8D03, analog line card (XALC)
- NT8D09, analog/message waiting line card (XMLC)
- NT5D11, line side T1 (XALC)

Interactions

MSL: Automated Datafill and Resource Allocation for the IPE has no functionality interactions.

Datafill

Table IPECARDS is created by this feature. This table requires the ENGWRITE ON setting to write into it.

Service orders

MSL: Automated Datafill and Resource Allocation for the IPE does not affect SERVORD.

Operational measurements

An existing OM group (PMRGFLT) is used to keep statistics of ringing resource failures. This OM is a maintenance OM used within the IPE maintenance procedures.

Logs

A log is produced as a result of a ringing resource failure. This log is in PM189 format.

User interface

MSL: Automated Datafill and Resource Allocation for the IPE does not affect user interface.

AD9718

MSL: Automated Datafill and Resource Allocation for the IPE (end)

Billing

MSL: Automated Datafill and Resource Allocation for the IPE does not affect billing.

AD9719

MSL: M2616CT & ATA Support

Functionality name

MSL: M2616CT & ATA Support

Description

This feature allows the system software to recognize and configure two additional terminal types. The first terminal, M2616CT, is a cordless version of the existing M2616 terminal and has the same interface and control into the MSL-100 system. The second terminal type, analog terminal adapter (ATA), adds an analog port to a digital terminal. The ATA fits into the base of the models M2006, M2008, M2008HF, M2216, M2616, and M2616CT phone sets and saves desktop space. The ATA has the same interface and control into the MSL-100 system as the existing M2006 phone set. The ATA is datafillable on the odd line equipment number (LEN) of a digital link module/intelligent peripheral equipment (DLM/IPE). Whereas the M2006 phone set along with all other voice sets, is only datafillable on the even LEN of a DLM/IPE.

These two additional terminal types are configured in the computing module (CM). The line group controller (LGC), line trunk controller (LTC), remote cluster controller (RCC), SONET remote cluster controller (RCC2) extended peripheral modules (XPM) which exist between the CM and the terminals handle these two terminal types as messages. The messages pass to and from the CM and the terminals. All messages transferred between the XPM and the M2616CT phone set and ATA are routed through an IPE or DLM circuit card. This feature identifies the definitions required within a host XPM for the additional terminals. It also allows the terminals to be datafillable using SERVORD with separate line class codes (LCC).

Accompanying features

The following features work in conjunction with this feature:

- AD9701, CNA: M2616CT & ATA Support
- AD9708, XPM: M2616CT & ATA Support
- AD9711, TL: M2616CT & ATA Support
- AD9753, CCM: M2616CT & ATA Support

AD9719**MSL: M2616CT & ATA Support (end)**

Hardware requirements

This feature works on the MSL-100 LGC or LTC XPM module interfacing with an M2616 cordless telephone (M2616CT) or an ATA. The following hardware components are associated with this feature:

- MSL-100 switch elements (CM, MS, Network)
- host XPM (LGC/LTC/RCC/RCC2)
- IPE/DLM
- M2616CT or other sets (M2006, M2008, M2008HF, M2216, M2616) containing the ATA terminal in their base

Limitations and restrictions

MSL: M2616CT & ATA Support has the same limitations or restrictions as the M2616 and the 2500 integrated business network (IBN) set, respectively.

Interactions

MSL: M2616CT & ATA Support has the same functionality interactions as the M2616 and the 2500 IBN set, respectively.

Datafill

Table LCCOPT is datafilled using the EXT file in the MSL layer.

Service orders

MSL: M2616CT & ATA Support does not affect SERVORD. See feature AD9753, CCM: M2616CT & ATA Support for information of SERVORD activity.

Operational measurements

MSL: M2616CT & ATA Support does not affect operational measurements.

Logs

MSL: M2616CT & ATA Support does not affect logs.

User interface

MSL: M2616CT & ATA Support does not change the user interface.

Billing

MSL: M2616CT & ATA Support does not affect billing.

AD9720

MSL: CFB/CFD Per Key Destination

Functionality name

MSL: CFB/CFD Per Key Destination

Description

This feature allows the user to assign different forwarding directory numbers (DN) to the keys specified in the KEYLIST of the Call Forward Busy/Call Forward Don't Answer (CFB/CFD) feature. This feature supports Meridian business sets (MBS), integrated voice and data (IVD) sets, and Integrated Services Digital Network (ISDN) sets.

The changes specific to the MSL layer involve supporting the CFB/CFD Per Key Destination feature on IVD sets.

To activate the feature, the switch administrator selects K for the CFB/CFD Per Key Control Field and specifies which DN keys he wants the feature active on in the KEYLIST. After the user of the set enters which keys he would like the feature on, he programs the forwarding DN as he would for the Programmable Control Option.

This feature does not affect how the current CFB/CFD Normal, Fixed, and Programmable Control Options works.

The control type, K, works with the office parameter CFX_SEPARATE_KEYLIST_FEATURE, found in table OFCENG. The office parameter can be set to Y or N.

The CFB/CFD-Internal/External feature supports the control type of K.

Accompanying features

The following features work in conjunction with this feature:

- AD9698, CCM: CFB/CFD Per Key Destination
- AD9702, CNA: CFB/CFD Per Key Destination

Hardware requirements

MSL: CFB/CFD Per Key Destination has no hardware requirements.

AD9720

MSL: CFB/CFD Per Key Destination (end)

Limitations and restrictions

The following limitations and restrictions apply to MSL: CFB/CFD Per Key Destination:

- This feature is assigned to the primary DN key of a set and has a maximum of 24 DN keys that can be specified in the KEYLIST.
- FTRGRPS and the residential varieties of CFB/CFD (CFBL/CFDA) do not support the CFB/CFD Per Key types.

Interactions

MSL: CFB/CFD Per Key Destination has no functionality interactions.

Datafill

MSL: CFB/CFD Per Key Destination does not affect data schema tables or office parameters.

Service orders

MSL: CFB/CFD Per Key Destination does not affect SERVORD.

Operational measurements

MSL: CFB/CFD Per Key Destination does not affect operational measurements.

Logs

MSL: CFB/CFD Per Key Destination does not affect logs.

User interface

MSL: CFB/CFD Per Key Destination does not change the user interface.

Billing

MSL: CFB/CFD Per Key Destination does not affect billing.

AD9724

IPE: Automated Datafill & Resource Allocation for IPE

Functionality name

IPE: Automated Datafill and Resource Allocation for the IPE

Description

This feature ensures proper allocation of resources for the ringing generator and performs the following:

- Design the IPE software to support both eight and 16 maximum ringing resources (MRR).
- Produce a log indicating that a ringing generator overload occurred with an OM pegged of how many overloads occurred.
- Withdraw ringing resources from the line side T1 interface (LTI) (NT5D11) line card.

The feature adjusts the maximum number of simultaneously ringing analog phone sets. This adjustment is done by sending a message to the intelligent peripheral equipment (IPE) from the computing module (CM), capturing the message and adjusting the MRR according to the message. The MRR value is set by executing either the RTS or QUERYPM command.

In addition, this feature withdraws analog ringing resources from the LTI line card by redefining it with its own card type within the IPE software. In the event that the ringing generator becomes overloaded, analog phone sets are placed into the resource's waiting queue. This feature increments the ring saturation counter and transmits a message to the CM that indicates the ringing generator overload state.

Accompanying features

This feature works in conjunction with the following features:

- AD9656, CCM: Automated Datafill for IPE Line Cards.
- AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.

Hardware requirements

The following hardware is needed for this feature:

- one IPE
- one Supernode/SNSE
- LTC/LGC/RCC/LTCI/LGCI/RCC2 (line trunk controller, line group controller, remote cluster controller)

AD9724**IPE: Automated Datafill & Resource Allocation for IPE** (continued)

- line side T1 interface line card with electronically erasable programmable memory (EEPROM) changes
- Ringing generators NT6D42, NT8D21, or NT7D03

Limitations and restrictions

The IPE: Automated Datafill and Resource Allocation for the IPE feature requires MSL07 software for a service representative to change MRR. Software below this release will set the MRR to eight.

Interactions

IPE: Automated Datafill and Resource Allocation for the IPE has no functionality interactions.

Datafill

IPE: Automated Datafill and Resource Allocation for the IPE does not affect data schema tables or office parameters. New data schema is created by feature AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.

Service orders

IPE: Automated Datafill and Resource Allocation for the IPE does not affect SERVORD.

Operational measurements

IPE: Automated Datafill and Resource Allocation for the IPE does not affect operational measurements. A new OM is produced in feature AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.

Logs

IPE: Automated Datafill and Resource Allocation for the IPE does not affect logs. A log is produced as a result of a ringing resource failure in feature AD9718, MSL: Automated Datafill and Resource Allocation for the IPE.

User interface

IPE: Automated Datafill and Resource Allocation for the IPE does not change the user interface. The MRR value is displayed at the MAP level by executing the QUERYPM command.

AD9724

IPE: Automated Datafill & Resource Allocation for IPE (end)

Billing

IPE: Automated Datafill and Resource Allocation for the IPE does not affect billing.

AD9725
MSL: VCDR Removal

Functionality name

MSL: VCDR Removal

Description

This feature removes references to variable call detail recording (VCDR) which is manufactured discontinued (MD). This software removes hooks to VCDR without compromising the existing functionality.

This feature removes all references to VCDR in the MSL development release unit (DRU).

Accompanying features

The following features work in conjunction with this feature:

- AD9730, CCM: VCDR Removal
- AD9783, CNA: VCDR Removal
- AD9817, SHR: VCDR Removal

Hardware requirements

MSL: VCDR Removal has no hardware requirements.

Limitations and restrictions

MSL: VCDR Removal has no limitations or restrictions.

Interactions

The following paragraphs describe the interactions between MSL: VCDR Removal and other functionalities.

This feature completes the removal of VCDR which was started by feature AD6563, MSL Misc Services Decoupling.

Datafill

Table CUSTVCDR is removed.

Service orders

MSL: VCDR Removal does not affect SERVORD.

Operational measurements

MSL: VCDR Removal does not affect operational measurements.

AD9725

MSL: VCDR Removal (end)

Logs

The following log modifications are made:

- Remove VCDR100.
- Remove VCDR101.

User interface

MSL: VCDR Removal does not change the user interface.

Billing

MSL: VCDR Removal does not affect billing.

AD9730
CCM: VCDR Removal

Functionality name

CCM: VCDR Removal

Description

This feature removes references to Variable call detail recording (VCDR) which is manufactured discontinued (MD). This software removes hooks to VCDR without compromising the existing functionality.

This feature removes all references to VCDR in the CCM development release unit (DRU).

Accompanying features

The following features work in conjunction with this feature:

- AD9725, MSL: VCDR Removal
- AD9783, CNA: VCDR Removal
- AD9817, SHR: VCDR Removal

Hardware requirements

CCM: VCDR Removal has no hardware requirements.

Limitations and restrictions

CCM: VCDR Removal has no limitations or restrictions.

Interactions

The following paragraphs describe the interactions between CCM: VCDR Removal and other functionalities.

This feature completes the removal of VCDR which was started by feature AD6563, MSL Misc. Services Decoupling.

Datafill

Modifications are made to the following tables:

- Table IBNXLA
- Table XLANAME

Service orders

CCM: VCDR Removal does not affect SERVORD.

AD9730

CCM: VCDR Removal (end)

Operational measurements

The operational measurement VCDR_RECORDING_UNIT is removed from OMGROUP EXT.

Logs

CCM: VCDR Removal does not affect logs.

User interface

CCM: VCDR Removal does not change the user interface.

Billing

CCM: VCDR Removal does not affect billing.

AD9731
TL: VCDR Removal

Functionality name

TL: VCDR Removal

Description

This feature removes the remaining references to variable call detail recording (VCDR) which is manufacture discontinued (MD). This software safely removes all remaining hooks to VCDR without compromising the existing functionality.

This feature removes all references to VCDR in the telecom (TL) development release unit (DRU).

Accompanying features

The following features work in conjunction with this feature:

- AD9725, MSL: VCDR Removal
- AD9730, CCM: VCDR Removal
- AD9783, CNA: VCDR Removal
- AD9849, BASE: VCDR Removal

Hardware requirements

TL: VCDR Removal has no hardware requirements.

Limitations and restrictions

TL: VCDR Removal has no limitations or restrictions.

Interactions

This feature completes the removal of VCDR which was started by feature AD6563, MSL Misc Services Decoupling.

Datafill

The following tables are modified:

- CRSMAP—Table CRSMAP is changed to reflect the removal of VCDR from the DATA_STREAM_FORMAT which is used for selecting different call types.
- CRSFMT—Table CRSFMT is changed to reflect the removal of VCDR from the DATA_STREAM_FORMAT which is used for selecting different call types.

AD9731

TL: VCDR Removal (end)

- TRKGRP—Table TRKGRP is changed to reflect the removal of VCDR from the options field for IBNT2 and IBNTI trunks.
- DIGMAN—Table DIGMAN is changed to reflect the removal of VCDR from the option field DDD.

Service orders

TL: VCDR Removal does not affect SERVORD.

Operational measurements

TL: VCDR Removal does not affect operational measurements.

Logs

TL: VCDR Removal does not affect logs.

User interface

TL: VCDR Removal does not change the user interface.

Billing

TL: VCDR Removal does not affect billing.

AD9753
CCM: M2616CT & ATA Support

Functionality name

CCM: M2616CT & ATA Support

Description

This feature allows the system software to recognize and configure two additional terminal types. The first terminal, M2616CT, is a cordless version of the existing M2616 terminal and has the same interface and control into the MSL-100 system. The second terminal type, analog terminal adapter (ATA), adds an analog port to a digital terminal. The ATA fits into the base of the models M2006, M2008, M2008HF, M2216, M2616, and M2616CT phone sets and saves desktop space. The ATA has the same interface and control into the MSL-100 system as the existing M2006 phone set. The ATA is datafillable on the odd line equipment number (LEN) of a digital link module/intelligent peripheral equipment (DLM/IPE). Whereas the M2006 phone set along with all other voice sets, is only datafillable on the even LEN of the DLM/IPE.

These two additional terminal types are configured in the computing module (CM). The line group controller (LGC), line trunk controller (LTC), remote cluster controller (RCC), SONET remote cluster controller (RCC2) extended peripheral modules (XPM) which exist between the CM and the terminals handle these two terminal types as messages. The messages pass to and from the CM and the terminals. All messages transferred between the XPM and the M2616CT phone set and ATA are routed through an IPE or DLM circuit card. This feature identifies the definitions required within a host XPM for the additional terminals. It also allows the terminals to be datafillable using SERVORD with separate line class codes (LCC).

Accompanying features

The following features work in conjunction with this feature:

- AD9701, CNA: M2616CT & ATA Support
- AD9708, XPM: M2616CT & ATA Support
- AD9711, TL: M2616CT & ATA Support
- AD9719, MSL: M2616CT & ATA Support

AD9753

CCM: M2616CT & ATA Support (continued)

Hardware requirements

This feature works on the MSL-100 LGC or LTC XPM module interfacing with an M2616 Cordless Telephone (M2616CT) or an ATA. The following hardware components are associated with this feature:

- MSL-100 switch elements (CM, MS, Network)
- host XPM (LGC/LTC/RCC/RCC2)
- IPE/DLM
- M2616CT or other sets (M2006, M2008, M2008HF, M2216, M2616) containing the ATA terminal in their base

Limitations and restrictions

CCM: M2616CT & ATA Support has no limitations or restrictions.

Interactions

All configurations of a DLM/IPE work, including a DS30 interface card of a fiber interface card.

Datafill

CCM: M2616CT & ATA Support does not affect data schema tables or office parameters.

Service orders

SERVORD is modified to allow the M2616CT phone set and ATA to be provisioned.

For the ATA, a user is only able to datafill this LCC on the odd LEN of a DLM/IPE. The SERVORD prompts are similar to the current M2006 single-line set.

Operational measurements

CCM: M2616CT & ATA Support does not affect operational measurements.

Logs

CCM: M2616CT & ATA Support does not affect logs.

User interface

CCM: M2616CT & ATA Support does not change the user interface.

AD9753

CCM: M2616CT & ATA Support (end)

Billing

CCM: M2616CT & ATA Support does not affect billing.

AD9783

CNA: VCDR Removal

Functionality name

CNA: VCDR Removal

Description

This feature removes references to variable call detail recording (VCDR) which is manufactured discontinued (MD). This software removes hooks to VCDR without compromising the existing functionality.

This feature removes all references to VCDR in the CNA development release unit (DRU).

Accompanying features

The following features work in conjunction with this feature:

- AD9725, MSL: VCDR Removal
- AD9730, CCM: VCDR Removal
- AD9817, SHR: VCDR Removal

Hardware requirements

CNA: VCDR Removal has no hardware requirements.

Limitations and restrictions

CNA: VCDR Removal has no limitations or restrictions.

Interactions

The following paragraphs describe the interactions between CNA: VCDR Removal and other functionalities.

This feature completes the removal of VCDR which was started by feature AD6563, MSL Misc Services Decoupling.

Datafill

CNA: VCDR Removal does not affect data schema tables or office parameters.

Service orders

CNA: VCDR Removal does not affect SERVORD.

Operational measurements

CNA: VCDR Removal does not affect operational measurements.

AD9783

CNA: VCDR Removal (end)

Logs

CNA: VCDR Removal does not affect logs.

User interface

CNA: VCDR Removal does not change the user interface.

Billing

CNA: VCDR Removal does not affect billing.

AD9817

SHR: VCDR Removal

Functionality name

SHR: VCDR Removal

Description

This feature removes references to variable call detail recording (VCDR) which is manufactured discontinued (MD). This software removes hooks to VCDR without compromising the existing functionality.

This feature removes all references to VCDR in the SHR development release unit (DRU).

Accompanying features

The following features work in conjunction with this feature:

- AD9725, MSL: VCDR Removal
- AD9730, CCM: VCDR Removal
- AD9783, CNA: VCDR Removal

Hardware requirements

SHR: VCDR Removal has no hardware requirements.

Limitations and restrictions

SHR: VCDR Removal has no limitations or restrictions.

Interactions

The following paragraphs describe the interactions between SHR: VCDR Removal and other functionalities.

This feature completes the removal of VCDR which was started by feature AD6563, MSL Misc Services Decoupling.

Datafill

Modifications are made to table TRKGRP.

Service orders

SHR: VCDR Removal does not affect SERVORD.

Operational measurements

SHR: VCDR Removal does not affect operational measurements.

AD9817

SHR: VCDR Removal (end)

Logs

SHR: VCDR Removal does not affect logs.

User interface

SHR: VCDR Removal does not change the user interface.

Billing

SHR: VCDR Removal does not affect billing.

AG0621

PAD Provisioning Software

Functionality name

PAD Provisioning Software

Description

PAD Provisioning Software provides a single set of PAD group names and values for use by all MSL-100 switches rather than having to custom engineer each office. This is required to implement the PBX loss or gain plan as defined by the Electronic Industries Association (EIA) standards for the MSL-100 switch.

For those MSL-100 PBX offices that do not wish to use the EIA standard names and values, the module SLPADIPL should not be included in their loads. Existing MSL-100 PBX offices may not decide to convert to this standard due to the work involved in changing all the tables that use PAD group names.

Hardware requirements

PAD Provisioning Software has no hardware requirements.

Limitations and restrictions

PAD Provisioning Software has no limitations or restrictions.

Interactions

PAD Provisioning Software has no functionality interactions.

Datafill

New PAD group names and values are entered in table PADDATA.

Service orders

PAD Provisioning Software does not affect SERVORD.

Operational measurements

PAD Provisioning Software does not affect operational measurements.

Logs

PAD Provisioning Software does not affect logs.

User interface

PAD Provisioning Software does not change the user interface.

AG0621

PAD Provisioning Software (end)

Billing

PAD Provisioning Software does not affect billing.

AM0032

XPEC call processing—phase I

Functionality name

XPEC Call Processing—Phase I

Description

This feature provides the Extended Peripheral Equipment (IPE), in the MSL-100 environment, with the following functions:

- **Circuit Disconnect:** Provides the capability for the extended Peripheral Equipment Controller (XPEC) to make connections between DS30X channels in an IPE and channels in the DS30A links to an XMS-based Peripheral Module.
- **Audit and Reconstruction of Connection Memory:** Compares connection memories with an image stored in Ram and makes corrections when discrepancies are detected.
- **Station Set Ringing and Cadence Control Features:** Processes commands from the XMS-based Peripheral Module (XPM) to initiate or terminate ringing of station sets attached to the IPE.
- **Babbling Set Detection, Isolation and Notification:** Performs monitoring of IPE ports to detect the condition of excessive message transmission from a particular station set indicating that an error condition exists.
- **EPEC Internal Message Queuing and Dequeuing Capabilities:** Performs message queuing tasks internal to the IPE.

Hardware requirements

XPEC Call Processing—Phase I has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to XPEC Call Processing—Phase I:

- Calls are completed in the IPE with this feature.
- No intra-switching is supported in the XPEC.

AM0032**XPEC call processing—phase I (end)**

Interactions

This feature interacts with software in the IPE. It has no affect on the XPM or Central Control (CC). This feature interacts with the following features in the XPEC:

- XPEC Message Translation (AM0043)
- XPEC Maintenance (AM0044)
- XPEC Monitor (AM0042)

Datafill

XPEC Call Processing—Phase I does not affect data schema tables or office parameters.

Service Orders

XPEC Call Processing—Phase I does not affect SERVORD.

Operational measurements

Dial Tone Speed Recording (DTRS) is not supported in this phase.

Logs

XPEC Call Processing—Phase I does not affect logs.

User interface

XPEC Call Processing—Phase I does not change the user interface.

Billing

XPEC Call Processing—Phase I does not affect billing.

AM0033

IPE PM maintenance—phase II

Functionality name

IPE PM Maintenance—Phase II

Description

This feature is a continuation of feature AM0037, IPE PM Maintenance—Phase I. This feature is concerned with the following:

- Diagnostics for Intelligent Peripheral Equipment (IPEs) and its associated line cards
- Log reports generated by IPE PM Maintenance. Logs are generated upon state changes of an IPE or one of its line cards, when a diagnostic routine finds a problem and when an IPE exception is detected.
- Operational Measurements (OMs) located on the IPE peripheral. When a fault is detected or other significant occurs, a corresponding OM is pegged.

Hardware requirements

IPE peripherals are required.

Limitations and restrictions

The following limitations and restrictions apply to IPE PM Maintenance—Phase II:

- This feature does not implement logs associated with audits.
- The OM group DTSR is not supported for IPEs.

Interactions

This feature needs the IPE MAP level to use the TST command. This feature does not enhance the Busy (BSY) and Return-To-Service (RTS) commands created in Phase I by adding the appropriate diagnostics as part of the BSY and RTS sequences.

Datafill

IPE PM Maintenance—Phase II does not affect data schema tables or office parameters.

Service Orders

IPE PM Maintenance—Phase II does not affect SERVORD.

AM0033**IPE PM maintenance—phase II** (continued)**Operational measurements**

The Operational Measurement (OM) group values affected by an IPE are as follows:

OM group	Description
PM	One tuple for each peripheral module. The stored measurements relate to the performance of the peripheral.
PMTYP	One tuple for each peripheral module type. The stored measurements relate to how the peripherals of a given type are doing collectively.
LMD	One tuple for each line peripheral. The stored measurements are related to call processing.
ENG640M1 TRA125M1 TRA125M2 TRA250M1	These remaining four OMs measure Subscriber Line Usage (SLU). Each of these scan a selected set of lines at a selected scan interval. There is a table corresponding to each of these OMs, where the lines to be scanned are listed. These tables are: • ENG40I1 • TRA125I1 • TRA125I2 • TRA250I1 An entry in another table (OFCVAR) determines the scan rate for each OM. There is only one tuple per OM group. These measurements reflect the usage of the set of lines listed in the table corresponding to the OM, scanned at the rate specified in the OFCVAR table.

Logs

The following is a list of logs, and a description of the event that causes the log to be generated. These logs are not exclusive to the IPE, and may be generated due to similar events or errors detected in other peripherals.

(Sheet 1 of 2)

Log	Description
PM 102	The IPE goes from the InSv or ISTb state to the SysB state.
PM 103	The IPE goes form the MBsy or SysB state to the Offl state.

AM0033**IPE PM maintenance—phase II (end)**

(Sheet 2 of 2)

Log	Description
PM 104	The IPE shelf goes from Offl state to an UnEq state. This log is only generated if the IPE is posted at the map when the state change occurs.
PM 105	The IPE goes from the InSv, ISTb, Offl, or SysB state to the ManB state.
PM 106	The IPE goes from the SysB or ManB state to the InSv state.
PM 107	The IPE goes from the InSv, SysB, or ManB state to the CBsy state.
PM 116	A message is sent from the IPE to the CC indicating that a message error is detected.
PM 117	There is some kind of trouble at the IPE. The reason for the trouble is described in the text of the log.
PM 128	The IPE goes from the InSv state to the ISTb state.
PM 179	A message is sent from the IPE to the CC indicating a hardware exception is detected.
PM 180	A message is sent from the IPE to the CC indicating a software exception has occurred.
PM 181	A Diagnostic at the IPE fails, or there is some information about the IPE to be logged. This log is also generated upon line card state changes.

User interface

IPE PM Maintenance—Phase II does not change the user interface.

Billing

IPE PM Maintenance—Phase II does not affect billing.

AM0034

IPE downloading

Functionality name

IPE Downloading

Description

The Intelligent Peripheral Equipment (IPE) downloading feature provides the necessary Central Control (CC) software support to download the IPE peripheral software load from the MSL-100 system.

This feature:

- provides a LOADPM command to allow MSL-100 customers to initiate the loading of peripheral program files into POST IPE via the IPE level of the Maintenance and Administration Position (MAP) system
- describes all responses to explain results or problems to users
- generates a log report when a IPE software load is downloaded

Hardware requirements

The following hardware requirements are necessary for this feature:

- an MSL-100 IPE Peripheral
- IVD Meridian M2000 and M3000 series sets

Limitations and restrictions

The following limitations and restrictions apply to IPE Downloading:

- Automatic loading of IPE software from a MSL-100 system is not supported by this feature.
- The IPE PM load may only reside on tape, disk, or SFDEV when it is downloaded from the MSL-100 system.

Interactions

IPE Downloading has no functionality interactions.

Datafill

IPE Downloading does not affect data schema tables or office parameters.

Service Orders

IPE Downloading does not affect SERVORD.

AM0034

IPE downloading (end)

Operational measurements

IPE Downloading does not affect operational measurements.

Logs

No new logs are introduced. However, the existing PM181 Log Report is enhanced to indicate the completion of the loading of IPE files. All the existing functions of this log remains the same.

User interface

A new command, LOADPM, is introduced by this feature to the IPE level of the Maintenance and Administration Position (MAP) system for initiating the download process of the IPE software from the MSL-100 system.

Billing

AMA/Billing is required if AMA/SMDR/Billing is affected.

AM0035**CC/IPE feature regression**

Functionality name

CC/IPE Feature Regression

Description

This feature verifies the table control and call processing aspects of MSL-100 features when assigned to IVD terminals residing on the new IPE. The following MSL-100 features are verified:

Automatic Message Accounting Test (AMATEST)

The Automatic Message Accounting (AMA) data associated with a particular line is verified by placing the AMATEST option on the line and making a call that originates or terminates to this line. This insures that a particular translations path is producing an AMA record and that the proper information is contained within the record fields.

AT&T Line Study (SDY)

The SDY is assigned to directory number (DN) appearances that require an AMA record for complaint observing studies (OBS) and line usage studies (LUS).

Authorization Code Conditional Last

With the Authorization Code Conditional Last feature, the user first dials the calling number. If it is then determined that call routing is restricted, the user is prompted for an authorization code. The call is then routed based on the network class of service (NCOS) of the entered authorization code.

Authorization Code Unconditional First

The Authorization Code Unconditional First feature allows the user to enter an authorization code prior to dialing the calling number. The subscriber first dials an authorization code access code which then prompts for the entrance of an authorization code. The subsequent call is then routed based on the NCOS of the authorization code as opposed to that of the station.

Auto Answerback (AAB)

The AAB feature allows any incoming call to the primary directory number (PDN) of the set (equipped with a hands-free unit with an auto answerback applique circuit) automatically answered after four seconds of ringing.

ACD Call Forcing

With the ACD Call Forcing feature, the agent does not need to press the INCALLS key to answer a call. A 500 millisecond burst of tone is given and

AM0035

CC/IPE feature regression (continued)

the lamp associated with the INCALLS key flashes. When the tone is completed, the call is automatically answered and the lamp stays on.

This feature increases the efficiency of an ACD agent by freeing the agent from conventional telephone interactions. When the caller disconnects, the ACD agent is given a 2.5 second delay, followed by a short burst of tone, and then is presented with another call. This delay allows the agent time to activate Make Set Busy (MSB) or ACD Not Ready (ACDNR) to stop the next call from being presented.

ACD Make Set Busy (MSB)

If an agent presses the MSB key while active on an ACD call, the agent is unable to receive new ACD or non-ACD calls. ACD and non-ACD calls already in progress when the MSB key is pressed are unaffected. If the MSB feature is activated on an idle ACD agent position, the agent is logged out.

ACD Line of Business Code Key (LOB)

The LOB feature provides the ACD agent with a smooth LOB code entry sequence during an ACD call. The agent, while active on an ACD call, stores the LOB code per ACD by pressing the LOB key and dialing the three-digit LOB code. The LOB code is sent to the Down Stream Processor via ACD MIS through the existing ACD call Released Event Messages.

ACD Not Ready (ACDNR)

This feature makes the ACD INCALLS key temporarily unable to receive ACD calls and also to release an answered ACD call by pressing the ACDNR key.

Call Agent key (CAG)

The CAG is used in conjunction with the Observe Agent (OBS) feature to conference a supervisor into the ACD call that is currently being observed or used to call an agent position so a supervisor can communicate with the agent.

When CAG is used to originate a call, the CAG key and the associated lamp function exactly like a secondary directory number (SDN) key that can only be used to originate calls.

When CAG is used in conjunction with the OBS key, the CAG conferences a supervisor into the ACD call that is currently being observed. The OBS feature enables a supervisor to listen (observation mode) or conference (conference mode) in on an ACD call. In the observation mode, the supervisor can only listen to the ACD call being observed. If the supervisor wants to enter

AM0035**CC/IPE feature regression** (continued)

the conversation, the CAG can be pressed to move from observation to conference mode.

Call Supervisor (CLSUP) key

The Call CLSUP key allows an ACD agent to call the supervisor using only one key. The agent does not need to dial the supervisor's INCALLS, SDN number, or program an Automatic Dialing (AUD) key.

The CLSUP key is also used to answer calls from the supervisor that are originated by the CAG key.

Agent key (AGT)

The AGT feature enhances the CAG and OBS features by reducing the dialing requirements. The AGT uses the same datafill as the Agent Status Lamp (ASL) feature. The lamp associated with the ASL feature always reflects the current status of the agent.

Agent Status Lamp (ASL)

The ASL allows the supervisor of an ACD group to monitor the status of the agent position. The lamp is updated when the status of the agent changes. Activity on an SDN is also monitored by the supervisor using the ASL feature.

Answer Emergency Key (AEMK)

The AEMK is an SDN on the supervisor set, designated to answer emergency calls from agents. Emergency calls from an agent are placed to the supervisor when an abusive caller is on the agent's ACD line.

Calls cannot be originated from this key, nor can any access codes be entered when this key is pressed.

Controlled Interflow (CIF)

CIF provides the capability to activate/deactivate CIF from an ACD supervisor's set. When CIF is active, new calls to an ACD group are rerouted to a customer defined in table ACDGRP.

Display Agent Summary Key (DASK)

The DASK feature provides the ACD supervisor with the capability to quickly check on the overall state of the ACD agent positions assigned to an ACD group. Pressing the DASK key for a particular ACD group displays the following number of agent positions:

- busy on ACD and non-ACD calls
- waiting for calls

AM0035

CC/IPE feature regression (continued)

- not ready to receive ACD calls
- not manned

Display Queue Status (DQS)

The DQS feature is assigned to an ACD supervisor set to allow the supervisor to display the load status information associated with an ACD group. A DQS key is assigned to a set having a 32-character alphanumeric display. Before the DQS feature is assigned to a set, the set must have key number one assigned to the Supervisor (SUPR) feature.

Display Queue Threshold (DQT)

The DQT feature is assigned to either an ACD agent or an ACD Supervisor set to display the threshold status associated with an ACD group.

Emergency Key (EMK)

The EMK feature allows the ACD agents to conference to their supervisor in the event of a threatening or abusive ACD call.

Multi-Stage Queue Status (MSQS)

The MSQS feature allows ACD supervisors and agents to quickly determine which ACD groups need help in the form of either additional agents or a redistribution of agent positions. Three thresholds are assigned on a per ACD group basis to assess call handling for the MSQS feature. These queue thresholds are monitored by the operation of SD points, by displaying the current thresholds on an agent's display each time an ACD call is presented to that ACD agent position, or by pressing the DQT key to display the current ACD group status.

Night Service (NGTSRVCE)

The OBS feature allows an ACD supervisor to press a Night Service key, placing all ACD agent sets, belonging to an ACD group, into night service mode. ACD calls arriving to the ACD queues, after night service is activated, are routed to a specified treatment. The NGTSRVCE feature allows an ACD supervisor to press a Night Service key, placing all ACD agent sets, belonging to an ACD group, into night service mode. ACD calls arriving to the ACD queues, after night service is activated, are routed to a specified treatment.

Supervisor (SUPR)

ACD allows a supervisor to perform special supervisory functions within the ACD group. A supervisor is designated by assigning the SUPR option to key number one of the set.

AM0035**CC/IPE feature regression** (continued)

Automatic Dialing (AUD)

AUD allows for frequently dialed numbers by pressing feature keys assigned to AUD. Each key is programmed.

Automatic Display (AUTODISP)

The AUTODISP feature displays incoming call information (such as calling name and number) on the display of a business set.

Automatic Line (AUL)

When an off-hook is reported from a line with the feature AUL, a connection is made to a predetermined location. This predetermined location is served by the switching unit or outpulsing. The stored number ranges from one to 15 digits.

Automatic Set Relocation (ASR)

ASR allows a telephone user to move IVD telephone sets from one location to another without the intervention of a service representative. After entering some special codes, the user simply unplugs the set from its current location and plugs the set into its new location. At the new location, the user goes off-hook (or presses the PDN), and dials the special ASR ``IN" code. This transfers all directory numbers and features associated with the set from the old LEN to its new location.

Blind Transfer Recall Identification

The Blind Transfer Recall Identification feature enables the user of a Business Set (with display) to change to a call transfer recall by a message on the display.

Block Calling Name/Number Delivery Blocking Per Call (CNNB/CNDB/CNB)

This feature allows subscribers to control the display of DNs on the terminating station on a call-by-call basis. It also allows subscribers to suppress their DN and Name to the termination station on a call-by-call basis. This feature introduces three access codes:

- Calling Number Delivery Blocking (CNDB)
- Call Number Blocking (CNB)
- Calling Number Name Blocking (CNNB)

Call Back Queuing (CBQ)

The CBQ feature notifies a station user, encountering an all trunks busy condition, when a trunk becomes idle. The user is then connected to the called

AM0035

CC/IPE feature regression (continued)

number using the CBQ feature. After receiving a busy tone or no-circuit treatment, the user activates CBQ by flashing. When the trunk against which the CBQ is activated becomes idle, the station user is notified by Ring Again ringing. When the station user goes off-hook to answer the CBQ recall, the network connection to the trunk is made and the called number is outpulsed.

Call Forwarding

Call Forwarding allows a customer to have incoming calls to a station automatically forwarded to a predetermined telephone number. Call Forwarding consists of several variants. Following are several call forwarding related features:

- Call Forwarding Universal (CFU): Permits stations to forward calls to user defined locations inside/outside of the customer group.
- Call Forward Intragroup (CFI): Permits stations to forward calls only to customer defined locations within the customer group programmable at activation time.
- Call Forward Fixed (CFF): Permits stations to forward calls only to locations initially entered by the Telephone Operating Company. This does not allow users to program the forwarding numbers.
- Call Forward Don't Answer (CFD): If the called station does not answer, the incoming call is routed to another designated station or to an attendant.
- Call Forward Busy (CFB): When the call station is busy, all calls are forwarded to a predefined station inside/outside the customer group.

Call Forwarding Universal Intragroup Fixed (CFUIF)

CFUIF is only available when the switching unit has the separate keylist feature. Four types of call forwarding (Universal, Intragroup, Fixed, Universal per Key) are available to allow them a separate keylist.

Call Forwarding Don't Answer Variable Timing (CFDVT)

The CFDVT feature allows customers flexibility in assigning different call forward don't answer time out values. CFDVT is assigned to DN appearances on the set that have the CFD feature assigned.

Call Forwarding Per Key (CFK)

The CFK feature allows the user to forward each DN on the Meridian Business Set to different destinations.

AM0035**CC/IPE feature regression (continued)**

Call Forwarding - Remote Access (CFRA)

The CFRA feature lets the user activate/deactivate CFU, or CFF call forwarding from a digitone (DGT) line other than his own.

Call Forwarding Simultaneous (CFS)

The CFS is available on a line-by-line basis and puts an upper bound on the number of calls forwarded simultaneously for lines with call forwarding options.

Call Forward Validation (CFWAL)

The CFWAL verifies that a line successfully forwards at the time that call forwarding is activated. Depending on the validation method specified for the customer group, the system either verifies routing to the forwarded DN or actually completes the call to the forwarded DN.

Denied Call Forwarding (DCF)

A line assigned this option does not receive any calls that have been forwarded.

Multiple Call Forward (MULTICFX)

The MULTICFX feature allows a station to forward more than one call at a time. This option allows multiple call forwarding for other call forwarding features such as CFU, CFI, CFB, and CFD.

Personal Call Screening (PCSCFA/PCSCFB/PC)

This feature allows a user to transfer calls back to a base station regardless of the fact that call forwarding is activated. This feature allows personal call screening for CFU/CFI (PCSCFA), CFB (PCSCFB), and CFD (PCSCFD).

Call Park (PRK)

PRK allows a DN appearance to park a call against its DN. The call is retrieved by any station by first requesting the call park retrieve and then dialing the DN of the station that parked the call.

Call Park Recall Identification

The Call Park Recall Identification feature allows the user of a business set to distinguish between Call Park (PRK) and Directed Call Park (DCPK) recalls and other types of calls. Depending on the options subscribed to, business users are alerted to a Call Park Recall in the following manner:

- a flashing DN
- a display message indicating that a call is a Call Park Recall

AM0035

CC/IPE feature regression (continued)

- a flashing Call Park lamp
- a distinctive ring

Call Transfer (CXR)

The CXR feature is assigned to a station when call transfer for the station is different from the call transfer assigned to the customer group in table CUSTSTN.

Call Transfer Warning (CTW)

CTW provides a warning tone to conferees whenever the transferring party remains on the line after transferring a call. A disconnect tone is given to the conferees after the transferring party goes on-hook.

Call Waiting (CWT)

This feature alerts a station of another call by a third party while talking to another party. The basic call waiting option only applies to the following:

- attendant extended
- Direct Inward Dial (DID)
- Enhanced Private Switching Communications (EPSCS)
- tie trunk calls

Call Waiting Exempt (CWX)

The CWX feature exempts a station from Dial Call Waiting (CWD) and Call Waiting Originate (CWO).

Call Waiting Intragroup (CWI)

The CWI feature allows intragroup calls to use call waiting. This option is only assigned to stations having the CWT option.

Call Waiting Originate (CWO)

The CWO feature imposes call waiting when a call is placed to a busy line that does not have CWI assigned.

Call Waiting Ringback (CWR)

The CWR feature provides a distinctive ringing option to the caller which indicates whether the destination is idle or engaged in another call. CWR can only be assigned to stations which have the CWT option.

AM0035**CC/IPE feature regression** (continued)**Calling Line Address Display (CLIDSP)**

The CLIDSP feature, which is only available through feature groups, provides greater flexibility in defining the format of the calling line address for display on business rates.

Calling Name Display (CND)

The CND feature provides a visual display on a business set for incoming and outgoing calls. Parties originating a call visually display the name of the party they have dialed. Parties receiving calls are given a visual display of the name of the party calling.

Calling Line Identification (CLI)

The CLI feature is assigned to DN appearances that require calling line identification. When this feature is assigned, all local and toll calls terminating on the caller's line record the time and date of the call as the LEN and DN of the line being called on the DMS log system. For local calls, the LINE 115 output report is used, which also provides the LEN and DN of the calling party. For toll calls, the LINE 117 output report is used, which also provides the common language name (CLLI) and the member number of the incoming line.

Cancel Call Waiting (CCW)

The CCW feature allows station users to use the Cancel Call Waiting feature provided CCW_AS_LINE_OPTION in table OFCVAR is set to ``Y" (Yes).

Carrier Toll Denied (CTD)

The CTD feature denies toll access from the given station for up to 21 selected carriers.

Closed User Group (CUG)

The CUG feature provides a measure of security by restricting access into and out of a predefined group of data lines while allowing members of the group to communicate with each other and with members of predetermined compatible groups. CUG numbers of both the originator and terminator are checked to decide whether the call is allowed to proceed.

Customer Data Change (CDC)

The CDC feature allows users to change the translation and routing parameters of their business sets and data units to suit their needs.

Denied Incoming (DIN)

If the DIN feature is assigned, the DN appearance cannot receive calls from outside the customer group. This includes all calls incoming by trunks, except

AM0035

CC/IPE feature regression (continued)

those trunk groups flagged as intragroup only. The attendant also cannot complete incoming calls to the station if the call originates outside the customer group unless DN is modified by a Terminating Restriction Code.

Denied Originating Service (DOR)

The DOR is assigned to any line where the customer receives calls only. When a line with the DOR option attempts to originate a call, it is routed to the originating suspended service treatment (ORSS) specified in the Line Treatment Table.

Denied Terminating Service (DTM)

The DTM is assigned to any line where the customer originates calls only. When translation attempts to terminate to a line with DTM, it is routed to Denied Terminating Treatment (DNTR) in the Line Treatment Table.

Dial Call Waiting (CWD)

This option allows a station to impose call waiting on a called station.

Directed Call Park (DCPK)

The DCPK feature allows any member of the set to park a call against any line in the same customer group. The call is retrieved by any line in the same customer group using either the DCPK key or dialing the Call Park Retrieve access code, and the DN of the parked line. If there is a security code associated with the DCPK feature on the line on which the call is parked against, then the security code is supplied.

Directed Call Pickup Barge-In (DCBI)

The DCBI permits a station to answer a call that is ringing on any other line within the same customer group by dialing the Directed Call Pickup (DCP) access code. If the call is answered by the called station, the DCBI station barges into the answered call and is connected into a three-way call configuration.

Directed Call Pickup Non Barge-In Exempt (DCBX)

The DCBX feature blocks any attempt by another station with DCBI to barge in if the call is answered by this station.

Directed Call Pickup Non Barge-In (DCPU)

The DCPU feature permits a station to answer a call, which is ringing on any other line within the same customer group, by dialing the DCP access code. If the call is not answered by the called station, the dialing sequence is completed.

AM0035**CC/IPE feature regression** (continued)**Directed Call Pickup Non Barge-In Exempt (DCPX)**

The DCPX feature blocks any station assigned with DCBI or DCPU from picking up a call ringing on this station.

Disconnect Timeout (DISCTO)

The DISCTO feature enables the data line held in an unavailable state for a predetermined amount of time. Some devices take a significant amount of time to clear a call in their software.

Display Called Number

The Display Called Number feature provides the user of a business set with the display of the called number. When the display is idle, incoming call information is automatically displayed on the upper line of the two-line display.

Display Module (M0200)

The Display Module feature provides a two-line by 24-character display for the following Meridian Digital Telephones: M2008, M2616, M2016S, M2216A, and M2216B.

Distinctive Ringing (DRING)

The DRING feature allows the subscriber to specify the ringing cadences (Bell Canada Ringing Cycles 1 through 8) that are supplied to different types of calls on a per set basis.

DN Network Attribute Suppression (SUPPRESS)

The SUPPRESS feature prohibits the display of line identification information.

Do Not Disturb (DND)

The DND feature is assigned to a DN appearance that is made a member of a DND group. When DND is activated on a DN appearance, all calls to that DN are diverted to a treatment (tone or announcement), to a specified route, or to an attendant. This feature only applies if option DND is assigned to the customer group.

Enhanced MBS Reason Display (REASDISP)

The REASDISP feature adds to the information displayed on a business set. Messages display to inform the user of the reason for a call redirection or to provide information about the progress of the call. This information is known as the "reason display".

AM0035

CC/IPE feature regression (continued)

Essential Line Service (ELN)

The ELN feature specifies that the line is exempt from override attempts.

Executive Bust Override (EBO)

The EBO feature allows a business set to call a busy station by pressing the EBO key or activating the EBO access code.

Executive Message Waiting (EMW)

The EMW feature allows a line to receive messages from calling stations with a compatible mailbox class of service (MCOS). The respective EMW lamp is turned on when there is a message.

Expensive Route Warning Tone (ERWT)

The ERWT feature provides a warning tone to indicate the selection of an expensive route. Upon receiving ERWT, the user either refuses to use the expensive route by going on-hook or waits for time out to occur and allows the call to terminate on the expensive route.

Flexible Station Controlled Conference (CNF)

The CNF feature permits a station to establish a conference call consisting of more than three parties without the assistance of the attendant. The maximum number of conferees, including the originating station is 30. The station can be assigned one of seven feature variants. These are 6, 10, 18, 22, 26 or 30 conferees. The conferees can include lines in the same customer group, lines belonging to another customer group, and stations reached by trunks.

Free Number Terminating (FNT)

The FNT feature applies to local calls only. It is assigned when a charge condition is not returned to the terminating call.

Group Intercom (GIC)

The GIC feature allows a user to terminate on a member of a predetermined group using abbreviated dialing. The Intercom group may contain any combination of 500/2500 sets and business sets. To originate a call, the desired GIC key is pressed and the terminating member's number is dialed. The corresponding GIC lamp of the termination member flashes and audible ringing is given if the set is not busy. Pressing the flashing GIC key answers the call.

Held Calls

The Held Call feature allows a business set user to hold an established call on any DN on the business set. The user may then originate or receive another

AM0035**CC/IPE feature regression** (continued)

call on any other idle DN. Business set Held Calls can be divided into two categories; Hold and Automatic Hold. To operate the regular Hold option, the user presses the Hold key to hold the active DN. To operate Automatic Hold, the user presses any channel-associated key. The original call may be reached by pressing its associated key.

Handsfree (HNDSFREE)

The HNDSFREE feature specifies whether or not a set can be used without a handset.

Hunting

assigned, the switch offers the call to a sequence of other lines, searching for an idle line to complete the call. There are seven types of Hunting available.

Directory Number Hunting (DNH)

Each line in the Hunt group has a unique DN. The hunt group is accessed by dialing the main number (Pilot DN) or by dialing the DN of one of the hunt group members. Hunting starts at the DN dialed.

Multi-Line Hunting (MLH)

There is one Pilot DN associated with the MLH. To access the group, the Pilot is dialed. Hunting starts with the pilot and ends at the last line, in a sequential fashion.

Distributed Line Hunting (DLH)

There is one Pilot DN associated with the DLH. To access the group, the Pilot DN is dialed. Hunting starts on the subsequent line in the group. If the line at which the hunting starts is not idle due to an origination, the next line is checked continuing until the hunting starting point is reached.

Line Hunt Overflow to a Route (LOR)

The LOR feature enables hunting to continue for a specified route, when all lines are busy.

Line Hunt Overflow to a DN (LOD)

The LOD feature enables hunting to continue to a specified DN, when all lines to a Hunt group are busy.

Bridged Night Number (BNN)

When a hunt group has several bridged night numbers, hunting takes place among the BNN. The BNN numbers can be formed into a BNN hunt group. Hunting is sequential unless Circular Hunting (CIR) to the hunt group.

AM0035

CC/IPE feature regression (continued)

Preferential Hunt (PRH)

The PRH feature (optional) is assigned to one or more of the DNH groups. Each DNH group can have up to 64 PRH lists with up to 19 members each. Calls made directly to a busy DN of a PRH list hunt over the members of the PRH list before returning to search the DNH group. Preferential hunting only occurs when the pilot DN of the PRH list is busy.

Individual Page From GIC (GICPAGE)

The GICPAGE feature provides for one member of a GIC group, using the GIC key of a business set, to activate the built-in alerting speaker of another GIC member's business set for paging purposes. Both GIC members must be in the same GIC group. If a two-way conversation is desired, the called party can press the "On" key of the handsfree unit or lift the handset.

Inspect (INSPECT)

The INSPECT feature displays information about feature keys, directory number keys, and call information on incoming calls to a DN key.

Intercom (ICM)

The ICM feature allows a station, upon pressing the intercom key, to directly terminate on a predesignated set. If the terminating set is not busy, audible ringing is given and the terminator's ICM key lamp begins flashing. The terminator then chooses to answer the call by pressing the ICM key or waits for the two-second delay preceding an automatic connection being made. If the set is busy, a buzzing tone is given to the terminator's set and the ICM key flashes but no automatic connection is made. To answer the call, the terminator presses the ICM key.

Key Expansion Module (M0022)

The Key Expansion Module feature allows for a 22-key add-on unit to be added to Meridian Digital telephone M2616, M2016S, M2216A, and M2216B.

Key Short Hunt (KSH)

The KSH feature allows incoming calls to search a set of DNs for idle DNs to terminate. Hunting always takes place starting from the dialed DN up the keys of the business set.

Last Number Redial (LNR)

The LNR feature permits the last number dialed to be redialed by using a single key instead of the whole number. Every time a number is dialed, it is stored as the LNR number. LNR is activated by pressing the pound sign (#) or dialing the LNR access code datafiled in the table IBNXL A.

AM0035**CC/IPE feature regression** (continued)

Last Number Redial Associated with Set (LNRA)

The LNRA feature permits the user to redial the last number dialed from the set, using one key. It is associated with the entire set, rather than a specific directory number. LNRA cannot be assigned if LNR is assigned to a set. The two options are mutually exclusive. LNRA can only be assigned to the PRN.

Listen On Hold

The Business Set Listen On Hold feature allows the user to put a called party on hold and listen to it through the speaker. The intended use of this feature is to enable the business user on hold to replace the handset and listen through the speaker to determine when the call is re-established.

Local Call Detail record (LCDR)

The LCDR feature is assigned to lines when details of all local calls originated by the line are recorded on the AMA tape.

Multiple Appearance Directory Number (MADN)

The MADN feature is assigned to more than one set. The sets that are assigned this DN are known as a MADN group. MADN groups are configured in either Single Call Arrangements (SCA) or Multiple Call Arrangements (MCA).

Single Call Arrangement (SCA)

The SCA allows one set to be active, either originating or terminating, on the MADN, at any given time. A MADN member can originate or pick up an incoming call while the MADN group is idle. When any member of the MADN group is in a call, the lamps of the remaining members are turned on to indicate that the group is busy. The PRL is used to establish a conference call among MADN SCA members and an external party. A maximum of 30 parties is permitted in a single MADN call.

Multiple Call Arrangement (MCA)

The MCA allows more than one set active on the MADN simultaneously. The number of simultaneous calls is restricted by the number of members in the MADN group. A MADN MCA member can originate calls without affecting the other members of the group.

Make Set Busy (MSB)

The MSB feature allows for all directory number appearances excluding private business lines and MADN members busy to all incoming calls. This feature is activated either by code access or by pressing the MSB key.

AM0035

CC/IPE feature regression (continued)

Make Set Busy Except GIC

The Make Set Busy Except GIC feature allows the subscriber to continue to receive GIC calls and calls on certain DN's while the MSB feature is active. Without this feature, the activation of MSB causes all incoming calls to receive a busy tone or other treatments.

Make Set Busy Intragroup (MSBI)

The MSBI feature allows the user to make a line busy or available to intragroup calls by activating/deactivating the MSB feature. External calls are not blocked. Intragroup calls, blocked while MSBI is active, receive a busy tone.

Malicious Call Hold (MCH)

The MCH feature allows any DN appearance on the business set to hold a connection on a malicious call. When both parties terminate in the same switching unit, the entire call is held until released by the called party. When the call is on an incoming trunk, the call is held to the incoming trunk.

Meridian Telecenter (TELECNR)

The TELECNTR feature applies only to the MPDA. It specifies that the MPDA use the Meridian Telecenter Personal Computer Application.

Meet Me Conference

The Meet Me Conference provides conference bridges and a DN that conference members dial at a specified time in order to hold a conference. The originator of a Meet Me Conference must call the attendant to receive a DN for a conference bridge, and inform all potential conference members of the DN, the time, and the date of the conference. Up to 30 conferees can participate the conference.

Message Waiting (MWT)

The MWT feature allows the PDN to receive and retrieve messages from the message center. Variations of this feature include an option of making a call request to another line that is busy/don't answer to ring back.

Message Waiting Indication (MWIDC)

The MWIDC allows an Electronic Business Set (EBS) with display to function as a message center. The EBS Message Center operator may activate/deactivate the message waiting indication at a user's telephone set. The operator presses the MWIDC key to activate the message waiting indication at the user's telephone set, indicating that calls forwarded to the EBS Message Center, directly or indirectly by that user, are waiting for retrieval. Upon call retrieval, the operator presses the MWIDC key to deactivate the message waiting indication at the user's set.

AM0035**CC/IPE feature regression** (continued)**Message Waiting Query (MWQRY)**

The MWQRY feature allows an EBS Center to manually enter a DN with which to check for messages for call retrieval.

Music On Hold (KSMOH)

The KSMOH feature provides music on hold for DN lines on business sets. When the business set user places a call on hold or autohold, the held party is connected to an audio source such as music. When the business set user takes the call off hold, the call is re-established on the DN line.

Network Resource Selector (NRS)

The NRS feature is only valid for data units. Activation of this feature causes a connection to the non-busy outbound DU-Modem pair selected from a modem pool by the switch when the user receives the carrier or answer tone when the far end modem goes off-hook.

No Double Connection (NDC)

The NDC feature is assigned to lines that are not connected to a verification or test circuit when the line is busy.

No Receiver Off-Hook Tone (NOH)

The NOH is not transmitted to lines with this option assigned when the lines have a permanent signal or partial condition.

Off-Hook Queuing (OHQ)

The OHQ feature allows a call, that cannot be completed because inexpensive, outgoing trunks are unavailable, to wait off-hook for an idle trunk. An idle trunk cannot be found in the inexpensive route set when Automatic Route Selection encounters a queue head in the route list. Inexpensive routes are defined as all routes before the queue head. When an outgoing trunk becomes available, the call progresses in a normal manner.

On-Hook Dialing

The On-Hook Dialing feature allows the user to originate calls without lifting the handset, by pressing an idle DN key and dialing the desired number. Call progression tones and ringback are heard through the business set speaker. The user may lift the handset at any time and establish a two-way connection. Feature keys such as Speed Calling, Automatic dialing, and Ring Again are used with On-Hook Dialing. The call terminates at any time by pressing the release key.

AM0035

CC/IPE feature regression (continued)

Originating Line Select Option (OLS)

The OLS feature consist of two options:

- Idle Line Select (IDLE): Allows a user to automatically connect to an idle line when going off-hook.
- No Line Select (NOSELECT): Requires a user to manually select the originating line by pressing the desired DN key.

Operator Number Identification (ONI)

The ONI option is assigned to lines that require operator number identification. Lines not assigned this option are assigned as Automatic Number Identification (ANI) lines.

Plug Up (PLP)

The PLP option is assigned to lines that are in the plug up state.

Preset Conference (CONF)

The CONF feature allows stations, trunks, or attendant consoles to set up a conference with a maximum of 25 conferees, by dialing a specific DN. This feature invokes simultaneous ringing of preselected conference members. The conferees are specified in advance in a data table indexed by the conference DN.

Primary Interlata Carrier (PIC)

The PIC feature assigns a PIC to an IBN line.

Private Business Line (PBL)

The PBL feature allows the DN appearance on the set to look like POTS lines, having a POTS dialing plan. All features assigned to the business set are unavailable to the PBL.

Query Busy Station (QBS)

The QBS feature allows a business set to monitor the busy/idle status of a specific set. It also allows the monitoring set to be alerted when the monitored set becomes idle.

Random Make Busy (RMB)

The RMB feature is assigned to any hunt line. It provides for a miscellaneous scan to point circuit controlled by an external key. When RMB is activated, the line is made permanently busy. When RMB is deactivated, the line is normal.

AM0035**CC/IPE feature regression** (continued)

Reason Display (READSP)

The READSP feature displays information about the feature keys, DN keys, and call information on incoming calls to a DN key, call waiting key, or Intercom without answering the call. Messages displayed can be defined to use the default set defined for the whole switch or uniquely defined for each set.

Requested Suspension (RSUS)

The RSUS feature is assigned to a DN appearance when the customer requests suspension of service. When RSUS is assigned to a DN, originations from and terminations to the specified DN are blocked. The call is instead routed to a customer specified treatment.

Ring Again (RAG)

The RAG feature allows a calling party encountering a busy station to be notified when the busy station becomes idle. When this occurs, the calling party receives notification tone. To complete the call, press an idle DN key and press the RAG key for the second time. The RAG feature dials the call and the calling party receives audible ringing.

Ringtype

The type of ringing that is generated on a set is datafillable. The following codes may be entered for the type of distinguishable ringing required:

- Fast High (FH)
- Fast Low (FL)
- Slow High (SH)
- Slow Low (SL)

Secondary Language (SL)

The SL feature gives users a second language option for office announcements for features such as Call Forward or Remote Access.

Security Code (SEC)

The SEC feature is assigned to a DN appearance when security is desired for the activation of certain features. When assigned, the security code must be supplied prior to the feature's activation.

Simplified Message Desk Interface (SMDI)

The SMDI feature provides an interface using a data link and the MSL-100 to a text messaging system type of message desk. Agents logged into a UCD

AM0035

CC/IPE feature regression (continued)

SMDI serve as an answering service for stations that have their calls forwarded.

Special Billing (SPB)

The SPB feature permits a billing DN, other than the station's DN, to be written to tape. For Station Message Detail Record (SMDR), the SPB DN is used if this feature is assigned to a line. The SPB DN must be a seven or ten-digit number.

Speed Calling Long List (SCL)

The SCL feature permits a customer to place calls to a previously designated list of frequently called numbers by dialing a two-digit speed calling code instead of the complete number. The long list consists of 30, 50, or 70 numbers. The SCL can belong to an individual line or a number of users.

Speed Calling Short List (SCS)

The SCS feature permits a customer to place calls to a previously designated list of frequently called numbers by dialing a two-digit speed calling code instead of the complete number. The short lists consists of ten stored numbers. The Speed Calling Codes can range from zero to nine.

Station Message Detail Record (SMDR)

The SMDR feature is assigned to lines when details of all local calls originated by the line are recorded on AMA tape. All entries on the AMA are in the SMDR format.

Station Origination Restrictions (SOR)

The SOR is assigned to any DN appearance in order to place that DN into a SOR group. A station or an attendant console that acts as a SOR Controller (SORC) can apply a SOR level (0 through 4) against the SOR group.

- A level 0 restriction permits completion of all calls allowed by the NCOS.
- A level 1 restriction allows completion of only intragroup calls and calls specified in an exception list.
- A level 2 restriction allows completion of only the intragroup calls.
- A level 3 restriction allows completion of only intragroup calls and calls specified in an exception list.
- A level 4 restriction allows completion of only 911 calls.

AM0035**CC/IPE feature regression** (continued)

Station Origination Restrictions Controller (SORC)

A DN with the SORC feature assigned is allowed to apply a restriction level (0 through 4) against another DN or group of DNs in the same customer group. The SOR feature is used to group the DNs.

Station Specific Authorization Code (SSAC)

The SSAC enables the customer to limit the validity of an authorization code (authcode) to a single set. This restriction increases security by proving that calls are made by the individual who owns a particular SSAC, since the authcode is linked to that individual's station.

SSAC eliminates the problem of unauthorized long distance charges and unfamiliar directory numbers appearing on user's accounts by allowing privileges accessed by an authcode only after the authcode is verified against the station from which it is disabled.

Stop Hunt (SHU)

The SHU feature is assigned to any DN appearance that is a member of DNH, MLH, or DLH hunt group. This feature provides for a miscellaneous scan point circuit controlled by an external key. When the key is not activated, the line is normal. The hunting feature is canceled when the key is activated. The same miscellaneous scan point may be simultaneously assigned to one, several, or all lines within the hunt group, depending on the number of lines having hunting canceled.

Subscriber Line Usage (SLU)

The SLU feature is assigned to a DN appearance that requires a peg count of all originating and terminating calls.

Suspended Service (SUS)

The SUS feature is assigned to lines that have originating and terminating service suspended.

Terminating Line Select Option (TLS)

The TLS feature consists of two options:

- Incoming Call Select: Allows a user to automatically answer an incoming call when going off-hook.
- No Line Select: Requires a user to manually select the line to answer by pressing the desired DN key.

AM0035

CC/IPE feature regression (continued)

Time and Charge Services on 1+ Calls (ATC)

The ATC feature applies to lines with time and charge option. When a line is assigned this feature, call details for all 1+ calls are sent to the printer. The charges are calculated and sent via phone back to the subscriber.

Total Essential Service (TES)

The TES feature applies to lines that are allowed access to the toll network, when all other lines are denied access, through the activation of toll network protection. All lines with the TES feature also have the option ELN.

Uniform Call Distribution (UCD)

The UCD feature permits even distribution of incoming calls to a number of predesignated sets.

Uniform Call Distribution Login (UCDLG)

The UCDLG feature allows a UCD agent to automatically login/logout of the specified UCD group.

Uniform Call Distribution SD Point (UCDSD)

The UCDSD allows a Signal Distributor (SD) point to monitor a UCD agent's login/logout status through an External Device Connection.

Three Way Calling (3WC)

The 3WC feature enables any DN appearance on the assigned set to add another party to an existing connection for a three way conference.

Hardware requirements

This feature requires IVD M2000 and M3000 series sets off the MSL-100 version of the IPE peripheral.

AM0035**CC/IPE feature regression** (continued)

Limitations and restrictions

The following limitations and restrictions apply to CC/IPE Feature Regression:

- Business Set features (unless supported in IVD terminals) and system features should function properly on IVD terminals residing on the IPE.
- Verification of an Attendant Console or Integrated Services Digital Network (ISDN) features does not occur.
- Verification of any Meridian Business Set features does not occur. This includes the following:
 - Call Covering (CCV)
 - Group Intercom All Call (GIAC)
 - Leave Message (LVM)
 - Message List Editing (MLE)
 - Power Feature Display (PFDSP)
 - Privacy (PRV)
 - Terminating Billing Option (TBO)
 - Terminal Management Environment (TME)

Interactions

This feature has no impact on existing MSL-100 features, but rather serves to verify functionality on IVD terminals residing on the IPE.

Datafill

CC/IPE Feature Regression does not affect data schema tables or office parameters.

Service Orders

Service Orders for the applicable MSL-100 features are verified by feature AM0036 - IPE Service Orders/Query Commands.

Operational measurements

CC/IPE Feature Regression does not affect operational measurements.

Logs

CC/IPE Feature Regression does not affect logs.

AM0035

CC/IPE feature regression (end)

User interface

CC/IPE Feature Regression does not change the user interface.

Billing

CC/IPE Feature Regression does not affect billing.

AM0036**IPE Service Orders/Query Commands**

Functionality name

IPE Service Orders/Query Commands

Description

This feature expands the MSL-100 Service Order capabilities to include support of the intelligent peripheral equipment (IPE). The IPE now supports integrated voice and data (IVD) digital lines. Service Orders are used to add and delete subscribers in the data base, add or delete options for a subscriber, and suspend or restore service and to query the information on a subscriber. In addition to the required enhancements, this feature also verifies the correct use of each SERVORD command on the new peripheral.

All existing service order commands are retained and are available for the IPE. All existing checking applies to the new IPE peripheral.

Hardware requirements

IPE Service Orders/Query Commands requires the MSL-100 version firmware for the M2000 and M3000 series sets. The IPE peripheral, NT8D25AA, is also required.

Limitations and restrictions

The following limitations and restrictions apply to IPE Service Orders/Query Commands:

- When assigning an IVD voice terminal to a line equipment number (LEN), the terminal may only be added to an even-numbered LEN. The data terminal Meridian asynchronous data option (MADO) or Meridian programmable display adapter (MPDA) may only be added to odd-numbered LENS.

Interactions

IPE Service Orders/Query Commands has no functionality interactions. This feature verifies the compatibility of the features documented in AM0035, CC/IPE Feature Regression.

Datafill

IPE Service Orders/Query Commands does not affect data schema tables or office parameters.

AM0036

IPE Service Orders/Query Commands (end)

Service orders

IPE Service Orders/Query Commands affects SERVORD as stated in the Description section.

Operational measurements

IPE Service Orders/Query Commands does not affect operational measurements.

Logs

IPE Service Orders/Query Commands does not affect logs.

User interface

IPE Service Orders/Query Commands does not change the user interface.

Billing

IPE Service Orders/Query Commands does not affect billing.

AM0037**IPE PM maintenance—phase I**

Functionality name

IPE PM Maintenance—Phase I

Release applicability

IPE PM Maintenance—Phase I was introduced in BCS31, and is applicable for MSL03 and up.

Description

This feature provides the Central Control (CC) software changes necessary to provide limited maintenance and diagnostic capabilities for the MSL-100 Intelligent Peripheral Equipment (IPE) and its associated interface cards. A new IPE MAP level is added. Maintenance commands provided by the new IPE level for the IPE are similar to those provided for other Meridian SL-100 peripherals, such as the Digital Line Module (DLM) and the Line Concentrating Module (LCM).

The Extended Peripheral Equipment Controller (XPEC) provides the primary interface and control functions for the IPE. It receives messages from the network, Line Trunk Controller (LTC) or Line Group Controller (LGC), peripheral line cards, and terminals. It communicates with Extended Digital Line Cards (XDLC) and Extended Message Waiting Line Cards (XMLC).

The XDLC has 16 ports and support 32 terminals per card. It interfaces with a maximum of 16 Meridian M2000 or M3000 digital sets, plus 16 data options. The XMLC supports 16 ports per card. An XMLC can be interfaced to a maximum of fifteen 500 or 2500 analog terminals, and supports message waiting lamp capability on terminals equipped with a message waiting lamp. Any line card slot in an IPE shelf accepts an XMLC or XDLC.

The XPEC resides in the IPE shelf and is capable of interfacing with as many as 16 line cards. In the Meridian SL-100 environment, the XPEC communicates with the cards through the CARD-LAN interface on the IPE back panel.

Links between an IPE and an MSL-100 system are assigned to an IPE in the IPEINV table. The first two links assigned to an IPE serve as combined message and speech links for the peripheral. The first 2 channels of a combined message and speech link carry message traffic and the remaining 30 channels carry speech traffic. The remaining links carry only speech traffic on all channels. One message and speech link is connected to each unit of the IPE's C-side peripheral (LGC or LTC). LGCs and LTCs operate in "hot stand-by" mode instead of load sharing mode. The IPE does not receive

AM0037**IPE PM maintenance—phase I** (continued)

conflicting messages from the two message links, because only one link is active at a time. Because the IPE is a simplex peripheral, the takeover process does not apply to this peripheral type.

IPE maintenance

A peripheral module with an IPE node type is a single-unit, single-shelf module. Up to four single-unit IPEs are housed in one Universal Equipment Module Frame (UEMF). The four IPEs in an UEMF are numbered from bottom to top with ascending numerical values assigned to each shelf. As with LCMs and DLMs, site names identify IPEs. The assignment of site name is controlled by entries in the SITE table. Each UEMF is identified by a discrimination number ranging from 0 to 99. This number, plus the shelf number of the IPE in the UEMF are the parameters used with the POST command. The site name, with the UEMF number and shelf number are also the key to table IPEINV. An IPE has as many as six DS30A C-side links to its controlling LTC or LGC. C-side link numbers range from 0 to 5. At the LTC or LGC, where these links are P-side, the links are identified using the range 0 to 19. This covers all 20 links to a number of peripherals or trunks. For maintenance purposes, each circuit on the IPE is identified by a circuit number that depends on the card type and a line subgroup number ranging from 0 to 15. This corresponds to the line card slot on the IPE shelf where the circuit resides.

IPE maintenance states are basically the same as those defined for other Meridian SL-100 peripherals. The following table provides a description of the valid IPE node states.

Valid IPE node states (Sheet 1 of 2)

IPE node state	Code	Description
System Busy	SysB	System maintenance automatically removes PMs from service.
Manual Busy	ManB	The BSY command manually removes PMs from service to allow testing and other manual maintenance action.
Offline	Offl	System maintenance does not act upon PMs. They must manually be brought back into service.

AM0037**IPE PM maintenance—phase I** (continued)**Valid IPE node states (Sheet 2 of 2)**

IPE node state	Code	Description
Central Side Busy	CBSy	PMs connected to the network are unable to communicate with the CC because the network or the links used to carry messages between the PM and the P-side of the network are unavailable.
In-Service Trouble	ISTb	PMs are still in service but flagged by system maintenance because a minor error condition occurred, the PM failed a minor audit test, or the load is not listed in the corresponding data table. Call processing service is unaffected.
In-Service	InSv	PMs are in service and available to support any intended process.

An IPE can be placed in the In-Service Trouble state for any of the following reasons:

- Line cards resident in the IPE do not match CC IPE lines datafill.
- There is a mismatch between the load specified in the IPEINV table and the actual software load in the IPE.
- One of the message links to the IPE is out of service.

IPE MAP level changes

Maintenance operations on an IPE are performed on the IPE level of the MAP display, which is an increment of the existing PM MAP level. The following is a list of commands available at the IPE level:

- The POST command accesses the PM sublevel for the specified PM or sets of PMs that the corresponding menu of commands is to perform action on. This command has been changed to allow access to the new IPE PM sublevel.
- The DISP command displays a list of all IPEs in the specified maintenance state. This is a PM level command. It has been changed to display IPEs using this command.
- The NEXT command posts the next IPE in the post set. The posted IPE number increases to the next higher discrimination number of the set of posted IPEs. The display is updated to show the state of the most recently

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IPE PM maintenance—phase I (continued)

posted IPE. This PM level command places the next PM in the post set into the control position. It now recognizes IPEs as a valid PM node type.

- The QUIT command causes the current display to change to a higher level.
- The TRNSL command identifies the C-side speech and message links of a previously posted IPE. The display includes the status and type of the links.
- The BSY command changes the state of an IPE in Manual Busy (ManB) state. The BSY command can be applied to the entire posted IPE, or to each individual card in the IPE. A PM105 log report generates whenever an IPE is placed in ManB state.
- The RTS command returns a posted IPE or any of its individual cards to service. No tests are executed. The device being returned to service must be in ManB state. A PM106 log report generates when an IPE is returned to service.
- The OFFL command places the posted IPE or one of its individual cards in the offline state. The device being taken off-line must first be placed in the ManB state. A PM103 log report generates when an IPE is set to offline. An off-line IPE remains in the OFFL state through all restarts.
- The QUERYPM command displays miscellaneous information about the posted IPE.
- The ABTK command aborts the current task on the posted IPE. This command does not appear on the menu for the IPE MAP level.

Hardware requirements

The following peripherals are required:

- Extended Peripheral Equipment Controller
- Extended Digital Line Card
- Peripheral Equipment Power Supply
- Universal Equipment Module (UEM)
- UEM Top Cap
- UEM Pedestal
- IVD Meridian M2000 or M3000 sets

AM0037**IPE PM maintenance—phase I (end)**

Limitations and restrictions

The following limitations and restrictions apply to IPE PM Maintenance—Phase I:

- No in-service tests are provided with this feature.
- No out-of-service tests are provided with this feature.
- No operational measurements are provided with this feature.
- Because the IPE is a single-unit peripheral, the takeover process does not apply to this peripheral type.

Interactions

IPE PM Maintenance—Phase I has no functionality interactions.

Datafill

IPE PM Maintenance—Phase I does not affect datafill.

Service Orders

IPE PM Maintenance—Phase I does not use SERVORD.

Operational measurements

IPE PM Maintenance—Phase I does not affect operational measurements.

Logs

IPE PM Maintenance—Phase I does not affect logs.

User interface

See the “IPE MAP level changes” section for a list of the commands that were added or changed for this feature.

Billing

IPE PM Maintenance—Phase I does not affect billing.

AM0038

XPM support of IPEs

Functionality name

XPM Support of IPEs

Description

This feature provides the Line Group Controller (LGC) and Line Trunk Controller (LTC) software to support Intelligent Peripheral Equipment (IPE). The IPE attaches to the P-side of XMS-based Peripheral Module (XPM). This peripheral supports Integrated Voice and Data (IVD) terminals for this feature. This feature provides the following functions:

- peripheral maintenance, which adds the capability for the software in the Central Control (CC) to send and receive messages to and from the IPE peripherals. Messages pass between the CC and the IPE through the XPM.
- facilities maintenance, which initializes store in the XPM for each datafilled terminal on an IPE peripheral. Facilities maintenance also provides support for any functions that the XPM needs for an IPE peripheral type, such as digit collection, messaging, updating the set data, and P-side channel allocation.
- call processing in the XPM

Hardware requirements

This feature requires an IPE attached to an XPM.

Limitations and restrictions

Analog sets are not supported with this feature.

Interactions

This feature is required to interface an IPE to an XPM. It is used by and uses other features to accomplish the interfacing of IVD terminals and analog sets to the MSL-100 digital switch.

Datafill

XPM Support of IPEs does not affect data schema tables or office parameters.

Service Orders

XPM Support of IPEs does not affect SERVORD.

Operational measurements

XPM Support of IPEs does not affect operational measurements.

AM0038

XPM support of IPEs (end)

Logs

XPM Support of IPEs does not affect logs.

User interface

XPM Support of IPEs does not change the user interface.

Billing

XPM Support of IPEs does not affect billing.

AM0039

IPE lines table control

Functionality name

IPE Lines Table Control

Description

This feature provides the software necessary to allow datafilling of Integrated Voice and Data (IVD) digital lines from an Intelligent Peripheral Equipment (IPE). Line Equipment Numbers (LENs) can now refer to lines on an IPE. This feature also establishes the valid product equipment codes (PECs) to line cards on the IPE.

This feature supports the following Meridian IVD terminal types:

- M2009
- M2112
- M2018
- Meridian Asynchronous Data Option (MADO)
- M2317
- M3000
- M2008
- M2616
- M2016S
- M2216A
- M2216B
- Meridian Programmable Data Adaptor (MPDA)

This feature affects tables LNINV and IVDINV.

Line equipment numbers

Line Equipment Numbers for the IPE include the following subfields:

- SITE - IPEs are assigned site names that fully identify them. The SITE table controls the assignment of site names.
- FRAME - The frame for an IPE refers to the Intelligent Peripheral Equipment Column (IPEC) where the IPE resides.
- SHELF - Each IPEC contains one to four IPEs. There is one IPE per shelf. Shelves are numbered starting from the bottom with shelf 0 through shelf 3.

AM0039

IPE lines table control (continued)

- LSG - Line subgroup refers to the subgroup number that corresponds to an IPE line card to which a line is assigned. There are 16 line subgroups on each IPE numbered 0 through 15.
- CIRCUIT - This refers to the circuit within an IPE line card to which a line is assigned. There are 32 circuits numbered 0 through 31 for each Extended Digital Line Card (XDLC). IVD digital sets can only be datafilled with even-numbered circuit numbers. The corresponding data option is datafilled in the odd-numbered circuit number, which is one greater than the mate set.

Table LNINV

The line circuit inventory table LNINV contains the following data for each line card slot:

- the LEN for each line
- the PEC of the line card for a line
- the pad group for the line
- the status of the line card

This feature associates LENs with an IPE and establishes the PECs for the new IPE line cards.

Table IVDINV

The IVD table contains the following information:

- the LEN
- the set type and ring type
- the optional features for a set

This feature allows datafilling of IVD sets on an IPE.

The following figure shows sample data tuples for table IVDINV. The first tuple shows a M2009 being datafilled with a fast high ring and no CDC option. The second tuple is the datafill for the associated Meridian Asynchronous Data Option (MADO).

AM0039**IPE lines table control** (continued)

Sample IVD data tuple

Site	Frame	IVDLEN Shelf	LSG	Circuit	SETDATA		Option	CDC Owner	*
					SET TYPE	RING TYPE			
Host	02	0	03	00	M2009	FH			\$
Host	02	0	03	01	MADO				\$

Hardware requirements

This feature is used with the Extended Digital Line Card (NT8D02AA). The IPE peripheral NT8D25AA is required.

Limitations and restrictions

A LEN for an IVD digital set can only be datafilled with an even-numbered circuit number. The corresponding data option is datafilled in the odd-numbered circuit number, which is one greater than the mate set.

Interactions

Before datafilling any tables changed in this feature, there must be a corresponding valid entry in table IPEINV.

Datafill

Tables LNINV and IVDINV were changed for this feature. Table LNINV was modified to accept lines hanging off the IPE. The new line cards used with the XPE are added to field CARDCODE, and LENs are checked for consistency between the line card being datafilled and the line cards that are already datafilled.

AM0039

IPE lines table control (continued)

Table LNINV

The following table lists the changed fields in table LNINV, the valid range of values for each field, and explains the change to each field that was implemented with this feature.

Changed fields in table LNINV

Field name	Range of values	Description of change
CARDCODE	N/A	Added card codes 8D02AA and 8D09AA for IPEs.
FRAME	0 through 99	FRAME can refer to an IPE column number.
SHELF	0 through 9	This field contains the valid shelf numbers for IPEs. Valid shelf numbers are 0 to 3. The lower-most IPE in a frame is shelf 0 and the upper-most IPE is shelf 3.
DRAWER or LSG	0 to 23	This field contains the valid line subgroup numbers for IPEs are 0 to 15.
CIRCUIT	0 to 31	The valid circuit numbers for IPEs depend on the card being datafilled. Circuits 0 to 15 are valid for the analog line card and circuits 0 to 31 are valid for the digital line card.
PADGRP	STDLN, UNBAL, PPHON, RCT LRLM, alphabetic, NPDGP, or "	Use only NPDGP for IEPs
GND	Y or N	Use only N for IPEs
BNV	L, NL, or "	Use only NL for IPEs
MNO	Y, N, or "	Use Y for IPE line cards

Before datafilling a line from an IPE in this table, there must be an entry for the IPE in the IPE inventory table IPEINV.

The following figure shows a sample data tuple for a digital line connected to an XDLC. There is no pad group assigned and the status is Hardware Assigned Software Unequipped (HASU).

AM0039**IPE lines table control** (continued)**Sample XDLC data tuple**

		LEN								
Site	Frame	Shelf	LSG	Circuit	Cardcode	PADGRP	Status	GND	BNV	MNO
Host	00	2	3	2	8D022A	NPDGP	HASU	N	NL	Y

Table IVDINV

Changes were made to the SHELF and SUBGROUP subfields of the LEN field so that IVD digital lines can be assigned to an IPE.

Changed fields in table IVDINV

Field name	Range of values	Description of change
FRAME	0 through 99	Frame can refer to an IPE frame number instead of only a DLM frame number.
SHELF	0 through 3	Shelf can refer to an IPE shelf number instead of only a DLM shelf number.
SUBGROUP	0 to 15	Subgroup can refer to an IPE subgroup number instead of only a DLM subgroup number.
CIRCUIT	0 to 31	Circuits can be on XDLCs that are used in the IPE. The PEC for the XDLC is NT8D02AA. For all IVD digital terminals except MADOs and MPDAs, the circuit number must be even (0 through 30). For MADOs and MPDAs, the circuit number must be odd and one greater than the set with which it is associated.

The following figure shows sample data tuples for table IVDINV. The first tuple shows a M2009 being datafilled with a fast high ring and no CDC option. The second tuple is the datafill for the associated Meridian Asynchronous Data Option (MADO).

AM0039**IPE lines table control** (continued)**Sample IVD data tuple**

Site	Frame	IVDLEN Shelf	LSG	Circuit	SETDATA		Option	CDC Owner	*
					SET TYPE	RING TYPE			
Host	02	0	03	00	M2009	FH			\$
Host	02	0	03	01	MADO				\$

Service Orders

The following table lists available service order commands and their definitions.

Service order input commands (Sheet 1 of 4)

Command	Use	Applicable to
ABNN	Adds bridged night numbers	Hunt group members
ADA	Adds an authcode	Offices with Integrated Business Network (IBN) authcodes
ADD	Adds lines to an existing hunt group	Hunt group members
ADO	Adds options to lines	Individual lines
	Adds existing lines to a DNH group	DNH group members, pilot of hunt group
	Adds options to hunt group lines specified by LEN	MLH/DLH group members
	Adds proprietary Electronic Telephone Set (P-phone) and Data Unit features to set and data unit keys	Electronic telephone set and data units
	Adds IVD voice and data features to voice set and data keys	Meridian voice and data sets
BULK	Verifies or updates from a batch of Service Orders input in bulk	All Service Order types
CDN	Changes Directory Number (DN)	All DNs of a hunt group except the pilot DN

AM0039**IPE lines table control** (continued)**Service order input commands (Sheet 2 of 4)**

Command	Use	Applicable to
CHF	Changes feature information for a feature that already exists on a line	Individual lines, DNH group members, pilot of hunt group, MLH/DLH group members, electronic telephone set and data units, and Meridian voice and data sets
CHG	Changes translation or routing information	Offices with IBN authcodes
CICP	Changes intercept type	All unassigned DNs
CKLN	Changes keyset line equipment number	N/A
CLN	Changes line equipment number	All lines except party lines
CLTG	Changes line treatment group	All Plain Ordinary Telephone Service (POTS) lines
DBNN	Deletes bridged night numbers	Hunt group members
DEA	Deletes an authcode	Offices with IBN authcodes
DEL	Deletes lines from a hunt group	Hunt group members except the pilot
DELCF	Deletes casual features	Standard lines
DEO	Deletes options from lines	Individual lines, DNH group members, pilot of hunt group
	Deletes options from hunt group lines specified by the LEN	MHL/DLH group members
	Deletes features from electronic telephone set keys	Electronic telephone set and data units
	Deletes features from Meridian set keys.	Meridian voice and data sets
DNC	Specifies the Dynamic Network Controller	Network Operating Systems (NOS) using a DNC through the DMS passthrough MAP display
DSP	Displays translation and routing information	Offices with IBN authcodes

AM0039**IPE lines table control** (continued)**Service order input commands (Sheet 3 of 4)**

Command	Use	Applicable to
ECHO	Turns on echoing of Service Orders to a terminal connected to the DMS/MSL-100 system	Service Order Echo
EST	Establishes a hunt group	Hunt groups with members having common options, 2WW service, electronic telephone set with DNH group, data unit, Meridian voice sets with DNH group, IVD data sets
NEW	Establishes service	Individual (non-hunt) lines and party lines, electronic telephone set and data units, Meridian voice and data sets
NEWDN	Assigns a block of DNs not associated with line equipment	DNs associated with an office route
	Assigns a station not associated with a LEN as the remote station to which calls are forwarded	Remote Call Forwarding feature
OUT	Removes service	Individual lines, pilot of hunt group, electronic telephone set and data units, Meridian voice and data sets
OUTDN	Deletes the assignment of a block of DN	DN associated with an office route
	Deletes the assignment of a remote station that calls are forwarded to	Remote Call Forwarding feature
PLP	Places on trouble intercept (plug-up)	Individual lines, pilot of hunt group, DNH group members
RES	Restores service from suspension or plug-up	Individual lines, pilot (to restore hunt group)
RESGRP	Restores service for a group of lines	Group of lines (NCOS)
SDNA	Sets up directory number attributes	Group of directory numbers
STOPECHO	Turns off echoing of Service Orders to a terminal connected to the DMS/MSL-100 system	Service Order echo

AM0039

IPE lines table control (end)

Service order input commands (Sheet 4 of 4)

Command	Use	Applicable to
SUS	Suspends service	Individual lines, pilot (to suspend hunt group)
SWAP	Enables the exchange of DNs for up to 32 LENS	Offices with IBN authcodes

Operational measurements

IPE Lines Table Control does not affect operational measurements.

Logs

IPE Lines Table Control does not affect logs.

User interface

IPE Lines Table Control does not change the user interface.

Billing

IPE Lines Table Control does not affect billing.

AM0040**XPE lines maintenance—phase I****Functionality name**

XPE Lines Maintenance—Phase I

Description

This feature enables a line circuit or set of line circuits served by Intelligent Peripheral Equipment (IPE) modules to be put into post (POST), busy (BSY), and return-to-service (RTS) modes. Maintenance actions on line circuits are invoked manually at the MAP display. This feature supports the following commands:

- POST
- BUSY
- RTS
- CKTLOC
- HOLD
- NEXT
- NEXTH
- NEXTP

The POST command is used to select a line circuit or set of line circuits from the IPE to the Line Test Position (LTP) for maintenance actions. The posted line circuit is placed in the control position. The POST command must be entered before using the BUSY or RTS commands. The following fields are displayed and continuously updated for a line in the control position:

- line class code
- party
- LEN
- DN
- state
- seizure indicator
- line test access (LTA) connection mode
- terminating equipment

The BUSY command is used to change the state of the line in the control position, or lines in the control set, to a Manual Busy (ManB) state. Only lines in the Call Processing Busy (CPB), Installation Busy (INB), Idle (IDL), and

AM0040

XPE lines maintenance—phase I (continued)

Lock-out (LO) state are affected. The ALL option appended to this command is used to change the states of all lines in the posted set, including the one in the control position, to ManB state. The state change requested by this command is delayed when invoked on a line or set of line circuits in the CPB state. The circuit is changed to CPD state and placed in the busy queue until the call in progress is completed.

The RTS command changes the state of the line in the control position or lines in the control set from the ManB state to the IDL state. Only lines in the ManB state are affected. The ALL option appended to this command returns all line circuits in the posted set to service.

The CKTLOC (circuit locate) command displays the location identifier of the circuit in the control position.

The HOLD, NEXT, NEXTH, and NEXTTP commands select and manipulate circuits in the Control and Hold positions of the Line Test Position (LTP). They are provided as in the previous implementation for the Meridian Integrated Voice and Data (IVD) sets.

Access to these maintenance commands for lines connected to the IPE are similar to those provided for lines connected to a Line Concentrating Module (LCM) or Digital Line Module (DLM).

Hardware requirements

This feature requires the new IPE peripherals and the IVD Meridian M2000 or M3000 series sets.

Limitations and restrictions

This feature provides limited commands for perform maintenance on lines connected to the IPE. The following limitations and restrictions apply to XPE Lines Maintenance—Phase I:

- No diagnostic test capabilities are supported in this release.
- Line circuits off the IPE are not included in Automatic Line Testing (ALT).
- The IPE supports only Meridian IVD M2000 and M3000 series terminals.

Interactions

This feature uses the existing access methods at the LTP level of the MAP display to post, make busy, and return lines to service off of the IPE.

AM0040

XPE lines maintenance—phase I (end)

Datafill

XPE Lines Maintenance—Phase I does not affect data schema tables or office parameters.

Service Orders

XPE Lines Maintenance—Phase I does not affect SERVORD.

Operational measurements

XPE Lines Maintenance—Phase I does not affect operational measurements.

Logs

XPE Lines Maintenance—Phase I does not affect logs.

User interface

XPE Lines Maintenance—Phase I requires no activation or deactivation by the end user.

The following directories are changed for this feature to include the new commands:

- LNLTPDIR
- LNDATADIR
- LNMANDIR

The commands that were changed for this feature are described in the "Description" section.

Billing

XPE Lines Maintenance—Phase I does not affect billing.

AM0041

IPE PM table control/call processing

Functionality name

IPE PM Table Control/Call Processing

Description

This feature verifies existing call processing and upgrades the software to allow Integrated Voice and Data (IVD) digital lines from Intelligent Peripheral Equipment (IPE) to perform basic line-to-line call processing. It also provides the necessary software within the Central Controller (CC) to support the new IPE node type for call processing purposes. A new inventory table, IEPINV, allows datafilling of the IPE into the Meridian SL-100 system.

This feature ensures that IVD digital lines on the IPE share the same call processing and feature codes as the equivalent agent types that the Digital Line Module (DLM) supports. The supported terminal types are as follows:

- M2009
- M2112
- M2018
- Meridian Asynchronous Data Option (MADO)
- M2317
- M3000
- M2008
- M2616
- M2016S
- M2216A
- M2216B
- Meridian Communications Adaptor (MCA)

An IPE is a single-unit, single-shelf module. As many as four IPEs can be stacked into one Intelligent Peripheral Equipment Column (IPEC). The four IPEs in an IPEC are numbered 0 through 3 from bottom to top. As with Line Concentrating Modules (LCMs) and Digital Line Modules (DLMs), site names identify IPEs. The SITE table controls the assignment of site names. The site name, a frame number (0 to 99), and a shelf number (0 to 3) further identifies the IPE. The site name, combined with the frame and shelf number are the key to the new inventory table, IPEINV. An IPE has as many as six DS30A C-side links to its controlling Line Trunk Controller (LTC) or Line

AM0041**IPE PM table control/call processing** (continued)

Group Controller (LGC). C-side links are numbered from 0 to 5. At the associated LTC or LGC, the links are numbered from 0 to 19.

All characteristics of an IPE are assigned through table IPEINV. For each frame of an IPE, this table assigns the following data:

- the site where the IPE is located
- the frame type that the peripheral module is mounted on
- the floor, row on floor, frame position in the row, and shelf number of the module
- the shelf position associated within an IPE frame
- the issue name of the peripheral module software
- the peripheral module type and number to which the IPE is attached
- the assignment of IPE C-side peripheral module links

Hardware requirements

A Meridian SL-100 IPE peripheral and Meridian M2000 and M3000 series IVD sets are required.

Limitations and restrictions

Only the Meridian M2000 and M3000 IVD sets are supported on the IPE peripheral. Only the Meridian SL-100 feature set is supported for this phase. Because the IPE is a single-unit peripheral, the takeover process does not apply to this peripheral type.

Interactions

This feature interacts with IPE lines and peripheral maintenance functions.

Datafill

The following table lists the fields in table IPEINV.

IPEINV fields (Sheet 1 of 3)

Field name	Valid values	Description
IPENM	Alphanumeric	The IPE name. This field is comprised of subfields SITE, FRAME, and SHELF, and is the key into the table.
SITE	Alphanumeric	The site name assigned to the IPE location. If left blank, the default value is HOST.

AM0041**IPE PM table control/call processing** (continued)**IPEINV fields (Sheet 2 of 3)**

Field name	Valid values	Description
FRAME	0 through 127	The physical frame number of the IPE.
SHELF	0 through 3	The IPE shelf number, numbered from the bottom. This number, combined with the entry in the FRAME field, produces a unique designation.
FRTYPE	IPEC	The frame type that the peripheral module equipment is mounted on. Enter IPEC for Intelligent Peripheral Equipment Column.
SHPOS	0 through 77	The shelf position that the peripheral module equipment is mounted on. The value indicates the number of inches above the floor.
FLOOR	0 through 99	The floor on which the peripheral module frame is located.
ROW	A-H, J-N, P-Z, AA-HH, JJ-NN, PP-ZZ	The row on the floor where the peripheral module frame is located.
FRPOS	0 through 99	The frame position in the row of the peripheral module equipment frame.
EQPEC	8D37AA	The equipment product engineering code (PEC) of the peripheral module.
LOAD	Alphanumeric	The name given to the issue of the peripheral module software.
CSPMNO	Alphanumeric	The C-side peripheral module number. This field is comprised of subfields PMTYPE and PMNO.
PMTYPE	LGC, LTC	The peripheral module type that this IPE is attached to.
PMNO	0 through 63	The peripheral module number that this IPE is attached to.
IPEINFO	Alphanumeric	The intelligent peripheral equipment information. This field is comprised of subfields IPESELECTOR and LKINFO.
IPESELECTOR	HIPE	The IPE selector. HIPE defines this IPE as a host.

AM0041**IPE PM table control/call processing** (continued)**IPEINV fields (Sheet 3 of 3)**

Field name	Valid values	Description
RGEQUIP	Y or N	This field specifies whether the unit is ringing generator equipped. Must be set to "N".
LKINFO	Vector 2 to 6 of 0 through 19 or \$	The C-side link information for IPESELECTOR=HIPE. The LGC or LTC links (0 through 19) that a host IPE is assigned to. At least two links must be defined. The first one is a message link. Two to six entries can be made. All links entered must be of type DS30A. Even-numbered links are usually assigned to unit 0 of the C-side peripheral, and odd-numbered links to unit 1. Enter \$ to end data entry.

Datafill this table in the same sequence as tables LCMINV and DLMINV. Tables LTCINV and LTCPSINV must be datafilled before table IPEINV. Table SITE can optionally be datafilled before table IPEINV. The minimum size of this table is 0 tuples; the maximum size is 255 tuples.

The following figure shows a sample data tuple.

Sample data tuple

IPENM			FRTYPE	SHPOS	Floor	Row	FRPOS
Site	Frame	Shelf					
Host	04	0	IPEC	4	2	B	16

EQPEC	Load	CSPMNO		IPEINFO		
		PMTYPE	PMNO	IPESEL	RGEQUIP	LKINFO
8D37AA	IPE31AA	LTC	1	HIPE	N	3 4 5 6 7 8 \$

Service Orders

IPE PM Table Control/Call Processing does not affect SERVORD.

Operational measurements

IPE PM Table Control/Call Processing does not affect operational measurements.

AM0041

IPE PM table control/call processing (end)

Logs

IPE PM Table Control/Call Processing does not affect logs.

User interface

IPE PM Table Control/Call Processing does not change the user interface.

Billing

IPE PM Table Control/Call Processing does not affect billing.

AM0042
XPEC monitor

Functionality name

XPEC Monitor

Description

This feature enhances the existing Extended Peripheral Equipment Controller (XPEC) monitor to facilitate software debugging. It also incorporates the pROBE-68K System Debugger/Analyzer (pROBE) into the XPEC software as an optional component. The user interface allows the user to switch easily between the XPEC Monitor and pROBE to debug the XPEC software.

The XPEC supports a maintenance port that interfaces to a maintenance terminal through a faceplate connector. The monitor allows Nortel personnel to control the maintenance port and execute commands given by the user. The user interface is an ASCII terminal connected to the nine-pin maintenance port interface on the XPEC. The XPEC Monitor is an internal debugging tool that is intended for Nortel personnel use only.

pROBE-68K is a system debugger and analyzer from Software Components Group (SCG), Inc. Along with pSOS-68K, pROBE is resident on the XPEC. It uses knowledge of the operating system software to observe, control, and simulate system execution. pROBE remains in stand-by mode until the user activates it.

Hardware requirements

This feature runs on the XPEC card (NT7D07AC). A maintenance port on the XPEC is used to interface to a maintenance terminal through a faceplate connector for monitoring the XPEC functions. An ASCII terminal is necessary to access the XPEC monitor. The dual UART (DUART) chip on the XPEC provides the interface port to the maintenance terminal. An ASCII terminal is required to use the XPEC monitor.

Limitations and restrictions

The following limitations and restrictions apply to XPEC Monitor:

- The XPEC monitor should be used by Nortel personnel only.
- pROBE is an optional component in this feature and can be excluded or included in an XPEC load as needed.
- The incorporation of XPEC monitor commands into PMDEBUG is not provided with this feature.

AM0042

XPEC monitor (continued)

Interactions

The XPEC Monitor commands and the pROBE commands provide various functions for monitoring and debugging the XPEC software. The monitor commands interact with different XPEC processes and their controlling mechanisms.

Note: Using these commands without caution can disrupt the normal XPEC operation.

Datafill

XPEC Monitor does not affect data schema tables or office parameters.

Service Orders

XPEC Monitor does not affect SERVORD.

Operational measurements

XPEC Monitor does not affect operational measurements.

Logs

XPEC Monitor does not affect logs.

User interface

Two distinct sets of monitoring and debugging commands are available through the maintenance port on the XPEC. One set of commands is an application-oriented debugging tool developed by Nortel Technology for internal use only. The other optional set consists of the pROBE-68K commands that were developed by SCG, Inc.

The monitor operates in one of two modes. After system initialization, the monitor is in the monitor mode. Only XPEC monitor commands are available in this mode. If pROBE-68K is present in the XPEC load, press the BREAK key to access pROBE mode. If pROBE is not built into the load, pressing the BREAK is treated simply as an error key input. To return to the monitor mode, clear any breakpoints and enter GO.

The prompt characters indicate the current mode. If the monitor is in monitor mode, the prompt appears as follows:

```
Vmmdd>
```

AM0042**XPEC monitor** (continued)

In this prompt, mmdd represents the release month and day. If the monitor is in pROBE mode, the prompt appears as follows:

pROBE>

XPEC monitor commands

The following are the commands that were modified for this release:

- Dump Memory (d) dumps XPEC memory, starting at a specified address with a specified length.
- Message (m) constructs a message destined to a specific queue in a test buffer.
- Help (h) displays a list of available commands and their command syntaxes.

The following are the commands that are new for this release:

- Dump IVD Status Record (di) dumps the IVD status record, starting at a specified IVD channel number.
- Display Message Monitor (dmon) displays the currently active message monitor settings.
- Dump Peripheral Status Record (dp) dumps the peripheral status record starting at a specified card.
- Dump R72 Control Memory (r72) dumps the R72 (TSIC chip) control memory for the specified DS30A link or line card.
- Remove Message Monitor (rmon) removes active messages under monitoring.
- Start Message Monitor (smon) monitors messages based on selected destination task ID, source task ID, line card number, and channel number.
- Write A31 Status Clear (wc) clears the buffer count and maximum messages used in the Write A31 Status command.
- XPEC Diagnostic Test (x) conduct basic XPEC diagnostic tests to detect any hardware abnormalities.

pROBE-68K commands

The following are the pROBE commands that are applicable in the Meridian SL-100 environment:

- Display Memory (DM)
- Patch Memory (PM)

AM0042

XPEC monitor (continued)

- Fill Memory (FM)
- Search Memory (SM)
- Search Memory (SM)
- Move Memory (MM)
- Compare Memory (CM)
- Disassemble Memory (DM)
- Assemble into Memory (AS)
- Display Registers (DR)
- Display Offset Registers (DF)
- Patch Registers (PR)
- Define Breaks (DB)
- List Breaks (LB)
- Clear Breaks (CB)
- Resume Execution (GO)
- Go Non-Stop (GN)
- Step (ST)
- Go Start pSOS (GS)
- Go Until pSOSExit (GX)
- Query Process (QP)
- Query Exchange (QX)
- Query Memory (QM)
- Query Time (QT)
- Query Configuration Table (QC)
- Enable Profile (EP)
- List Profile Data (LP)
- Issue pSOS System Call (SC)
- Evaluate Constant (FC)
- Set pROBE Flag (FL)
- Help (HE)

AM0042

XPEC monitor (end)

Billing

XPEC Monitor does not affect billing.

AM0043

XPEC message translation

Functionality name

XPEC Message Translation

Description

This feature translates messages from DMS-X format to an internal Extended Peripheral Equipment Controller (XPEC) format, or from the internal XPEC format to DMS-X format, and routes these messages to an appropriate software process. The purpose of this feature is to:

- manage communications between the XMS-based Peripheral Module (XPM) and Extended Peripheral Equipment (XPE) from the XPEC C-side
- translate messages destined for the XPM or Central Controller (CC) into DMS-X format over a DS30A link using DMS-X protocol
- receive a reset message from the XPM and reset the XPE when that type of message is received
- receive call processing and maintenance messages from the XPM and route the request to the appropriate process
- receive set messages from the XPM and pass them down to the line cards

This feature is required to provide the XPEC with messaging capability with XPMs through a DS30A link, using DMS-X protocol. Messages over the DS30A link adhere to the DMS-X protocol. DMS-X is a byte-oriented, half duplex protocol. Handshaking is performed between communicating transceivers. The DMS-X format has the following structure:

- two start-of-message bytes
- packet data
- two Cyclic Redundancy Check (CRC) bytes
- two end-of-message bytes

The packet data encompasses destination IDs, source task IDs, the peripheral processor number, destination terminal ID, and data bytes that contain the actual message.

Set messages are translated for the Extended Digital Line Card (XDLC) and Extended Message Waiting Line Card (XMLC) for 500 and 2500 sets. If there is a transmission error, the XPEC S71 chip retries the transmission. If the second transmission fails, it discards the buffer and pegs an error counter. No timeout mechanism exists when a message is sent to the XP from the XPE. If the link fails when a message is sent, or needs to be sent, no action is taken.

AM0043

XPEC message translation (end)

Hardware requirements

This feature requires the following components:

- Extended Peripheral Equipment Controller
- Extended Digital Line Card
- Peripheral Equipment Power Supply (PEPS)
- Universal Equipment Module (UEM)
- UEM Top Cap
- UEM Pedestal
- A/C Ringing Generator (ACRG)
- XPE Backplane (XPE B/P)

Limitations and restrictions

This feature does not provide diagnostics.

Interactions

XPEC Message Translation has no functionality interactions.

Datafill

XPEC Message Translation does not affect data schema tables or office parameters.

Service Orders

XPEC Message Translation does not affect SERVORD.

Operational measurements

XPEC Message Translation does not affect operational measurements.

Logs

XPEC Message Translation does not affect logs.

User interface

XPEC Message Translation does not change the user interface.

Billing

XPEC Message Translation does not affect billing.

AM0044

XPEC maintenance - phase I

Functionality name

XPEC Maintenance - Phase I

Description

The Extended Peripheral Equipment Controller (XPEC) Maintenance (Phase I) feature provides the following three functions within the Intelligent Peripheral Equipment (IPE) in the MSL-100 environment:

System Initialization

Performs operating system and applications software initialization.

- This function defines the operating system configuration table, provides procedures for handling processor exceptions, and invokes the operating system startup procedure.
- This function activates the applications software initialization processes, creates interprocess communication paths, and initializes the contents of the data structures.

Routine Maintenance

Responds to and acts upon busy, return-to-service (RTS), test, link status, configuration, and query messages from the Central Control (CC).

- Busy messages are used to logically disable equipment so that it no longer participates in call processing. In the IPE, busy messages refer to one of three types of equipment: the XPEC, line cards, or terminals.
- RTS messages are used to logically enable equipment so that it may participate in call processing. In the IPE, RTS messages refer to one of three types of equipment: the XPEC, line cards, or terminals.
- Test messages are used to isolate faults in the IPE. In the IPE, two comprehensive tests are available: the in-service test and the out-of-service test.
- Link status messages are used to control the operation of the C-side DS-30A links. In the IPE, the links can be either enabled or disabled.
- Configuration messages are used to set up the operational parameters of equipment. In the IPE, configuration messages refer to either line cards or terminals.
- Query messages are used to determine the configuration of equipment. In the IPE, query messages return the load name, the line card configuration, and various maintenance statistics.

AM0044**XPEC maintenance - phase I** (continued)**Background Maintenance**

Handles equipment auditing, hexadecimal display control, watchdog timer setting, and phase lock loop switching.

- Equipment is audited periodically in order to detect unexpected changes in operational status. This function audits each line card and terminal at least once every 15 seconds.
- The EXPEC faceplate has a two digit hexadecimal display. This function handles all output directed to this display from other processes.
- The ability to recover from catastrophic software failures is very important. The XPEC has a watchdog timer circuit that resets the board automatically if it is not cleared periodically by the applications software. This function clears the watchdog timer on a regular basis. If the watchdog times out, a catastrophic software failure is assumed and the XPEC is reset.
- The IPE must be synchronized to the C-side communication links in order to communicate over them. The XPEC has a phase lock loop circuit that accomplishes this synchronization. This function attempts to resynchronize the XPEC if the phase lock loop loses sync with the C-side links.

Hardware requirements

XPEC Maintenance - Phase I requires the MSL-100 version of XPEC firmware.

XPEC Maintenance - Phase I requires the following components:

- Extended Peripheral Equipment Controller (XPEC), NT7D07AC
- Extended Digital Line Card (XDLC), NT8D02AA
- Peripheral Equipment Power Supply (PEPS), NT8D06AA
- Universal Equipment Module (UEM), NT8D25AA

Limitations and restrictions

XPEC Maintenance - Phase I currently only supports digital line cards and digital terminals.

Interactions

The following features interact with XPEC Maintenance - Phase I:

- XPI PM Maintenance (Phase 1)
- XPI PM Maintenance (Phase 2)

AM0044

XPEC maintenance - phase I (end)

- XPM Support of IPEs
- XPEC Message Translation
- XPEC Call Processing

Datafill

XPEC Maintenance - Phase I does not affect data schema tables or office parameters.

Service orders

XPEC Maintenance - Phase I does not affect SERVORD.

Operational measurements

XPEC Maintenance - Phase I does not affect operational measurements.

Logs

XPEC Maintenance - Phase I does not affect logs.

User interface

XPEC Maintenance - Phase I outputs to the hexadecimal display.

Billing

XPEC Maintenance - Phase I does not affect billing.

AM0103
XPEC firmware

Functionality name

XPEC Firmware

Description

This feature covers the message support for Return-To-Service (RTS) and download functions required for the XPEC card. The XPEC pack is used on the IPE shelf, and it serves as the interface between the DS-30 line cards on the shelf and the DS-30A links on the MSL-100 LGC. The XPEC is able to serve up to sixteen DS-30X line cards and from two to six DS-30A network loops.

The following functions are provided by the XPEC II firmware:

- Power up initialization—upon power up the faceplate LED is turned on indicating XPEC is out of service and all decimal points are turned on. After power up, the XPEC attempts to synchronize with the network clock. The characters “CF” appear on the faceplate display until synchronization is obtained and then “00” is displayed.
- Message support for IPE Return-To-Service—the first step in the RTS sequence is to reset the XPEC processor by sending it a RESET message and thus setting the XPEC into the WAI state. The XPEC awaits a STATUS message. Once the message is received a diagnostic test can be requested by sending a TEST message to the XPEC. The final step is to initialize the system by sending a RUN message to the XPEC. Once the message is acknowledged, program execution is turned over to the download software.
- Message support for IPE Peripheral software download—the first step in the RTS sequence is to reset the XPEC processor by sending it a RESET message and thus setting the XPEC into the WAI state. The XPEC awaits a STATUS message. Once the message is received a diagnostic test can be requested by sending a TEST message to the XPEC. The next step is to load the XPEC by sending a sequence of LOAD messages. The response to this message is either an acknowledgement or an error. After loading is complete, the XPM sends a LOAD_CHK message. The final step is to initialize the system by sending a RUN message to the XPEC, and it responds.

Hardware requirements

XPEC Firmware runs on the XPEC card.

Limitations and restrictions

XPEC Firmware has no limitations or restrictions.

AM0103

XPEC firmware (end)

Interactions

XPEC Firmware has no functionality interactions.

Datafill

XPEC Firmware does not affect data schema tables or office parameters.

Service orders

XPEC Firmware does not affect SERVORD.

Operational measurements

XPEC Firmware does not affect operational measurements.

Logs

XPEC Firmware does not affect logs.

User interface

XPEC Firmware does not change the user interface.

Billing

XPEC Firmware does not affect billing.

AM0117**M2006 single-line digital set support**

Functionality name

M2006 Single-line Digital Set Support

Description

The M2006 single-line digital set is one of the Meridian IVD (Integrated Voice and Data) sets. The M2006 set provides the following options:

- A single DN (Directory Number) set
- A six-key set with functionality similar to that of the M2008 set
- Full support of all existing features except those with display capabilities

This feature provides the necessary software to introduce the new terminal type to the Extended Multiprocessor System (XMS)-based Multiprocessor System (XPM) and to make changes to decode and encode the new messages necessary to support the M2006 set. This feature also provides modified facility maintenance diagnostics for testing the M2006 set as other sets are tested.

Hardware requirements

The Meridian IVD sets are supported only on the 7X49 Digital Line Module (DLM) with 8X47BA Enhanced Digital Port Cards (EDPCs). The EDPC is a 16-port line card, with 16 voice and 16 data channels. There are two channels per port. The even-numbered channels (0-30) are voice channels, and the odd-numbered channels (1-31) are data channels.

Limitations and restrictions

The following limitations and restrictions apply to M2006 Single-line Digital Set Support:

- When assigning LENs (Line Equipment Numbers) to a DLM, users can enter only 0 to 9 in the drawer or line subgroup position of the LEN. For example, if a user wants to assign an IVD set to LEN 2 0 1 10, the third position, which is the 1 in this case, is the drawer number of the LEN.
- The set must have a Primary Directory Number (PDN) datafilled before datafilling anything else for the set
- The M2006 does not support any display option

Interactions

M2006 Single-line Digital Set Support has no functionality interactions.

AM0117

M2006 single-line digital set support (end)

Datafill

M2006 Single-line Digital Set Support does not affect data schema tables or office parameters.

Service Orders

Service orders are updated to include the Meridian M2006 IVD set. This set is treated like the other IVD sets currently in the service order. Prompts follow those that are already established for other IVD sets

Error Message

If a user adds a secondary DN to an IVD set and specifies M2006 as the set, the following error message is displayed:

Only a single DN is allowed for the M2006 set.

MDPA

When adding directory numbers or features to the M2006 set that has either an ADATA1 datafilled as the mate line, key 6 of the set is not available for assignment. Key 6 becomes dedicated to local functions when the set has the MPDA datafilled in the mate line position.

Note: The LEN of the mate data line is the same as the LEN of the voice set plus one.

Operational measurements

M2006 does not affect operational measurements.

Logs

M2006 Single-line Digital Set Support does not affect logs.

User interface

M2006 Single-line Digital Set Support does not change the user interface.

Billing

M2006 Single-line Digital Set Support does not affect billing.

AM0125**IPE PM maintenance - phase III**

Functionality name

IPE PM Maintenance - Phase III

Description

This feature is a continuation of IPE PM Maintenance - Phase I and IPE PM Maintenance - Phase II. It provides the Central Control (CC) software necessary to provide the following functionality:

- complete/Expand/Correct any IPE MAP level commands required by Intelligent Peripheral Equipment (IPE) CC maintenance.
- support Extended Message Waiting Line Cards (XMLC) and Extended Analog Line Cards (XALC) on an IPE shelf.
- support fault detection and handling for the IPE and its associated line interface cards (Extended Digital Line Card, XMLC, XALC).
- support a ringing generator on an IPE shelf, and update the IPE MAP level to provide information regarding the ringing generator.
- support a second messaging link to an IPE peripheral.

Without this feature, XMLCs and XALCs are not supported on an IPE. Also, no diagnostics are invoked for an IPE during the RTS sequence or prior to software downloading if this feature is not present. The QUERYPM command at the IPE MAP level is enhanced to provide more information to the craftsperson. Finally, no system-invoked diagnostics or maintenance actions are invoked in response to unsolicited messages received from an IPE. Only PM180 logs are produced.

Hardware requirements

The Meridian SL-100 version of the XPEC firmware and XPEC Self Test & Diagnostic Firmware is required.

IPE peripherals are required consisting of at least the following hardware:

- Extended Peripheral Equipment Controller (XPEC)
- Extended Digital Line Card (XDLC)
- Extended Analog Line Card (XALC)
- PE Power Supply PCBA, DC version
- Extended Message Waiting Line Card
- DC Ringing Generator

AM0125

IPE PM maintenance - phase III (end)

- Universal Equipment Module
- UEM Top Cap
- UEM Pedestal

Limitations and restrictions

Limited capability of the System Monitor Card for an IPE in the Meridian SL-100 environment is provided, therefore very limited diagnostic and status information is currently provided for IPE ringing generators.

Interactions

IPE PM Maintenance - Phase III requires XPEC Maintenance Phase II and XPEC Self Test & Diagnostics Firmware in order to function correctly.

Datafill

IPE PM Maintenance - Phase III does not affect data schema tables or office parameters.

Service orders

IPE PM Maintenance - Phase III does not affect SERVORD.

Operational measurements

IPE PM Maintenance - Phase III does not affect operational measurements.

Logs

IPE PM Maintenance - Phase III does not affect logs.

User interface

IPE PM Maintenance - Phase III provides enhancements to the RTS, LOADPM, and QUERYPM commands at the IPE MAP level.

Billing

IPE PM Maintenance - Phase III does not affect billing.

AM0126**IPE lines maintenance - phase II**

Functionality name

IPE Lines Maintenance - Phase II

Description

The use of Intelligent Peripheral Equipments (IPEs) in Meridian SL-100 installations require modifications to facilities maintenance, which includes maintenance and diagnostics for line circuits. This feature completes the second phase of development of maintenance software for digital and analog line circuits served by the IPE.

This feature provides the following functions for line circuits:

- Diagnostic capability for all Meridian IVD terminals and 500/2500 type station sets—the diagnostic capabilities are invoked using the DIAG (diagnose) command at the Line Test Position (LTP) level of the Maintenance and Administration Position (MAP).
- Maintenance functions on Meridian sets and 500/2500 type station sets—in addition to diagnostic tests, all facility maintenance actions on Meridian sets and analog type sets can be invoked manually through the use of the following levels of MAP: Line Test Position (LTP), Line Test Position Manual (LTPMAN), Line Test Position Line Test Access (LTPLTA), and Line Test Position Data (LTPDATA).
- Log reports generated by IPE facilities maintenance.
- Operational Measurements (OMs) effected by the IPE lines.

IPE MAP level enhancements

The following are IPE MAP level enhancements from this feature:

- Return-to-service (RTS) Command Changes—the RTS command is enhanced to provide diagnostic capabilities during the RTS of an IPE.
- QUERYPM Command Changes—the output for the basic QUERYPM command issued with no parameters is altered to display the interface line card types datafilled in the lines inventory (LNINV) table for the IPE being queried as well as the actual card types resident in the IPE shelf. The QUERYPM CNTRS command is changed to allow the user to optionally specify which link to query for DMSX counter information. A new option, INVEN (inventory), is added to the QUERYPM command that allows the CC to collect and report inventory information such as firmware version,

AM0126

IPE lines maintenance - phase II (continued)

card identification information, and card type for interface cards and the XPEC card residing in an IPE shelf.

- **LOADPM Command Changes**—the LOADPM command is enhanced to provide diagnostic capability during the execution of the LOADPM command prior to the downloading of software to an IPE.

IPE fault detection and handling

With the enhancements provided by this feature, IPE CC maintenance software now recognizes and responds to the following unsolicited messages from an IPE.

- **"WHO-AM-I"**—this message is passed to the CC from an XPM that receives a WHO-AM-I (WAI) message from an IPE. This message is sent when an IPE requires restarting or reloading.
- **"SOFTWARE_ERROR"**—this message is sent to the CC from an IPE when software residing in the IPE detects an error. This functionality is enhanced to allow IPE CC maintenance to react to the message based on its severity.
- **"TRAP"**—this message is sent to the CC from an IPE when hardware-detected errors are detected. They are handled in a manner similar to serious software errors.
- **"BABBLING_LINE"**—this message is sent to the CC from an IPE when a babbling line is detected. The message is passed to facilities maintenance procedures for processing.
- **"SELF_TEST_FAILED"**—this message is sent to the CC from an IPE when the IPE fails a self test. If an interface card is removed from its slot, this message is generated. The severity of the test failure determines whether the IPE is placed in ISTb or SysB state by IPE CC maintenance.
- **"ICMO"**—this message is generated by the XPM based on information received from an IPE regarding incoming message overload.

XALC/XMLC maintenance

XMLC/XACL supports 500/2500 analog sets, therefore, IPE CC maintenance software is changed to support the new card type. These changes involve changing CC to IPE messaging to accept an XMLC/XALC as a valid IPE interface card type, and detecting mismatch between CC datafill and IPE hardware. Both the RTS PM and RTS CARD commands are enhanced so that if the CC sends an IPE a card configuration message with the wrong interface card type, the IPE reports the problem, and the CC responds by placing those cards where the mismatch occurred in SysB state.

AM0126**IPE lines maintenance - phase II** (continued)**Ringling generator support**

The QUERYPM command at the IPE MAP level is altered slightly to allow a craftsperson to determine the status of the ringing generator in an InSv IPE shelf.

Dual message link support

With this feature, the CC is able to support messaging to an IPE on either of two message links. The links to an IPE are defined in table IPEINV with the first two datafilled for a given IPE designated as the message links.

Hardware requirements

IPE Lines Maintenance - Phase II requires Meridian IVD sets connected the the Extended Digital line card and 500/2500 analog sets connected to the Extended Message Waiting Line Card or Extended Analog Line Card.

An XPE with the Meridian SL-100 version of XPEC firmware is required.

IPE Lines Maintenance - Phase II requires the following minimum level of hardware:

- Extended Peripheral Equipment Controller (XPEC)
- Extended Digital Line Card (XDLC)
- Extended Message Waiting Line Card (XMLC)
- Extended Analog Line Card (XALC)
- PE Power Supply PCBA, DC version (PEPS)
- DC Ringing Generator (DCRG)
- Universal Equipment Module (UEM)
- UEM Top Cap (TOP CAP)
- UEM Pedestal (PEDESTAL)

Limitations and restrictions

This feature only supports the following terminals connected to the XDLC and XMLC:

- Meridian M2000 and M3000 digital terminals.
- Analog 500 and 2500 station sets.
- There is no relay or Metallic Test access on XDLC, XMLC, and XALC. The diagnostic is very limited. There are no subscriber loop tests.

AM0126

IPE lines maintenance - phase II (end)

This feature only supports the POST, BUSY, DIAG, CKTLOC, CKTTST, and RTS commands for the XDLC line card.

This feature only supports the POST, BUSY, CKTLOC, and RTS commands for the XALC and XMLC line cards.

Interactions

Without this feature, a full set of facilities maintenance actions cannot be performed on digital or analog line circuits connected to the IPE. Only limited commands can be performed on IVD digit line circuits (Post, Busy, and Return-to-service).

Datafill

IPE Lines Maintenance - Phase II does not affect data schema tables or office parameters.

Service orders

IPE Lines Maintenance - Phase II does not affect SERVORD.

Operational measurements

The IPE Lines Maintenance - Phase II feature does not add new operational measurements to the system. The existing peg count PMCCTDG (Circuit diagnostics run) expands to peg when the diagnostic is run on a line off an IPE. The existing peg count PMCCTFL (Circuit diagnostics fails) expands to peg when a fault occurs after diagnostic is run on a line off an IPE.

Logs

IPE Lines Maintenance - Phase II does not require any new logs. Existing logs are used. The CARD TYPE appearing in LINE101 log are expanded to include the new cardcodes NT8D02AA, NT8D09AB, and NT8D03AB. Other than the card type changes, the format of the logs are the same.

User interface

IPE Lines Maintenance - Phase II includes changes to the LTP, LTPMAN, LTPLTP, and LTPDATA levels of the MAP. Refer to the Descriptions section for more information on the changes to the user interface.

Billing

IPE Lines Maintenance - Phase II does not affect billing.

AM0127
IPE link diagnostics

Functionality name

IPE Link Diagnostics

Description

This feature enhances the existing Central Controller (CC) and XMS-based peripheral module (XPM) link diagnostic software to allow for link looparounds/testing to be performed on DS-30A links connected to Intelligent Peripheral Equipment (IPE). XPM Bit Error Rate Testing (XBERT) for these links is also supported.

This feature concentrates on diagnosing problems in the hardware interface between an XPM and an IPE. There are between two and six DS-30A links between an XPM and an IPE. Two of these links may be used for messaging and speech, and the remaining links are used for speech only. All messaging between an XPM and an IPE takes place on the two messaging links. If both of these links go down, the IPE can no longer perform any call processing. Therefore, errors on these links are a high priority and the craftsman must be informed as quickly as possible. On the other hand, if one or more of the speech-only links must be taken out-of-service, then call processing can continue on the IPE. However, these links should be corrected as soon as possible to avoid possible degradation of performance of the IPE due to lack of available speech channels.

This feature may be broken down to the following areas:

- Testing of links using the TST LINK command when the central side (C-side) XPM is posted.
- Periodic auditing of the links.
- Testing of the links using XBERT.

TST LINK command

In order to use the TST LINK command to test a link to an IPE, the user must first bring the IPE in-service and then post the C-side XPM for that IPE on a Maintenance Administrative Position (MAP). After the XPM is posted, perform a TRNSL P to get the number of the link to be tested. Issue the "TEST LINK x" (where "x" is the number of the link to be tested).

Upon issuing this command the following tests are performed:

- Link interface hardware presence in the XPM.
- PCM looparound (all links).

AM0127

IPE link diagnostics (continued)

If one of the tests should fail on a link, an error message is displayed on the MAP, a log is generated, and no further action is taken.

Link audits

Tests on all P-side links of an XPM are run periodically. These tests include:

- Link interface hardware presence in the XPM
- PCM looparound

If one of these tests fail, the link is put in the system busy (SysB) state. If the failing link is the only in-service messaging link to the IPE, then the IPE is marked C-side busy (Cbsy), otherwise the IPE enters an in-service-trouble (ISTB) state with reason "C-side Link Out-of-service". One log each is generated when a link diagnostic fails, when a link is marked SysB, and when an IPE is marked Cbsy.

XBERT

XBERT is a diagnostic tool used to detect bit marginal XPM, Line Concentrating Module (LCM), and Digital Line Module (DLM) components responsible for inducing bit errors in the transmission of data. This feature enhances XBERT so that IPE components may also be tested. This is done by the creation of a new test called XBERTIPE. No other XBERT tests are affected by this feature.

The XBERTIPE test tries to establish the test path (looparound). If this looparound attempt is unsuccessful, then an appropriate error message is displayed and the test is aborted. If the IPE looparound is successfully allocated, then the test is performed by injecting a tone at the 6X69 card and checking at the receiving end to see if the bits are the same as the ones sent.

Hardware requirements

IPE Link Diagnostics requires the following hardware:

- IPE peripherals.
- The Meridian SL-100 version of the XPEC firmware, and XPEC Self Test & Diagnostics.
- In order to use XBERT on an XPM, it must be equipped with a NT6X69AB message card, or a NT6X69AA message card, and a NT6X79AA tone card.

AM0127**IPE link diagnostics (end)**

Limitations and restrictions

The following limitations and restrictions apply to IPE Link Diagnostics:

- Without this feature, problems with DS-30A links between an XPM and an IPE cannot be detected.
- This feature does not provide the capability for taking appropriate action when a link to an IPE is taken out-of-service due to a diagnostic failure. This is handled as part of the IPE PM Maintenance - Phase III feature.

Interactions

IPE Link Diagnostics interacts with the following features:

- IPE PM Maintenance - Phase III
- XPEC Message Interface - Phase II
- XPEC Call Processing - Phase II

Datafill

IPE Link Diagnostics does not affect data schema tables or office parameters.

Service orders

IPE Link Diagnostics does not affect SERVORD.

Operational measurements

IPE Link Diagnostics does not affect operational measurements.

Logs

The following is a new instance for when a PM 181 log can be generated. This log is generated as a result of the IPE detecting a fault on one of its links:

```
PM181 JUN14 19:12:23 7443 INFO IPE HOST 00 3IPE  
detected fault on LINK 0
```

User interface

IPE Link Diagnostics creates a new test called XBERTIPE in the XBERT level of the XPM monitor.

Billing

IPE Link Diagnostics does not affect billing.

AM0128

Analog lines on IPE

Functionality name

Analog Lines on IPE

Description

This feature extends IPE support from Integrated Voice and Data (IVD) digital sets to 500/2500 analog sets by providing the following capabilities:

- allowing datafill on analog lines from an IPE in tables LNINV and IBNLINES
- allowing Service Orders and line query commands on analog lines off of Intelligent Peripheral Equipment (IPE)
- enhancing the existing Central Control (CC) call processing to support analog lines off of an IPE
- verifying the proper functioning of existing MSL-100 features for 500/2500 analog sets off an IPE

Table Control

Tables LNINV and IBNLINES now support the datafilling of LENS associated with analog lines off of an IPE. Table LNINV supports two new card codes for the IPE: 8D03AB and 8D09AB. Card code 8D03AB corresponds to the Extended Analog Line Card (XALC) that supports 500 and 2500 sets without message waiting lamps. Card code 8D09AB corresponds to the Extended Message Waiting Line Card (XMLC). The IPE must be equipped with an XMLC for 500 and 2500 sets to support message waiting lamps. Table IBNLINES now supports LENS that are associated with analog lines from an IPE. Checks now ensure that the IPE LEN that is added is correctly datafilled in table LNINV with card code 8D03AB or 8D09AB.

Service Orders

This feature ensures that all existing Service Orders and line query commands function correctly when used in conjunction with analog lines attached to an IPE. Service Orders provide a rapid means of performing operations such as assigning and deassigning Directory Numbers (DN) and line options and features. Line query commands provide information about subscriber lines.

AM0128**Analog lines on IPE** (continued)

Call Processing

MSL-100 call processing has been extended to analog lines from an IPE. Call processing involves establishing a call between two telephony agents. This process requires the successful completion of the following:

- detection of a line origination
- digit collection
- digit translation and call routing
- establishing a speech path between originator and terminator
- applying ringing to the terminator and audible ringback tone to the originator
- detection of an answer
- detection of a disconnect by either originator or terminator

This feature ensures that these call processing steps are properly performed when one or both of the telephony agents is an IPE analog line.

Feature Verification

This feature verifies the MSL-100 features when assigned to 500 and 2500 sets residing on the IPE. The verified features include a set of station and system features. The following MSL-100 features are verified:

- Automatic Message Accounting test (AMATEST)
- AT&T line study (SDY)
- Authorization Code Conditional Last
- Authorization Code Unconditional First
- Automatic Call Distribution (ACD)
- Automatic Line (AUL)
- Blind Transfer Recall
- Calling Number Blocking
- Call Back Queuing
- Call Forwarding (CFX)
- Call Hold (CHD)
- Call Pickup (CPU)
- Call Transfer (CXR)

AM0128

Analog lines on IPE (continued)

- Call Transfer Warning (CTW)
- Call Waiting (CWT)
- Call Waiting Exempt (CWX)
- Call Waiting Intragroup (CWI)
- Call Waiting Originate (CWO)
- Call Waiting Ringback (CWR)
- Calling Line Identification (CLI)
- Call Line Identification with Flash (CLF)
- Cancel Call Waiting (CCW)
- Carrier Toll Denied (CTD)
- Common Control Switching Arrangement (CCSA)
- Custom IBN (Integrated Business Network) Disconnect Treatment (CDT)
- Customer Data Change (CDC)
- Cutoff on Disconnect (COD)
- Denied Incoming (DIN)
- Denied Originating Service (DOR)
- Denied Terminating Service (DTM)
- Dial Call Waiting (CWD)
- Directed Call Park (DCPK)
- Directed Call Pickup Barge-in (DCBI)
- Directed Call Pickup Barge-in Exempt (DCPX)
- Distinctive Ringing (DRING)
- DN Network Attribute Suppression (SUPPRESS)
- Do Not Disturb (DND)
- Essential Line Service (ELN)
- Executive Busy Override (EBO)
- Executive Busy Override Exempted (EBX)
- Executive Message Waiting (EMW)
- Expensive Route Warning Tone (ERWT)
- Feature Group (FTRGRP)

AM0128**Analog lines on IPE (continued)**

- Fire Reporting System, Originating (FRO)
- Flexible Station Controlled Conference (CNF)
- Free Number Terminating (FNT)
- Group Intercom (GIC)
- Hunting
- Directory Number Hunting (DNH)
- Multi-line Hunting (MLH)
- Distributed Line Hunting (DLH)
- Line Hunt Overflow to a Route (LOR)
- Line Hunt Overflow to a DN (LOD)
- Bridged Night Number (BNN)
- Preferential Hunt (PRH)
- Ignore Flash (FIG)
- Last Number Redial (LNR)
- Local Call Detail Record (LCDR)
- Make Set Busy All Calls (MSB)
- Make Set Busy Intragroup (MSBI)
- Meet Me Conference
- Message Waiting (MWT)
- Multiple Appearance Directory Number (MADN)
- Single Call Arrangement (SCA)
- Multiple Call Arrangement (MCA)
- Privacy Release (PRL)
- No Double Connection (NDC)
- No Line Insulation Test (NLT)
- No Receiver Off-hook Tone (NOH)
- Off-hook Queuing (OHQ)
- Operator Number Identification (ONI)
- Park (PRK)
- Permanent Hold (HLD)

AM0128

Analog lines on IPE (continued)

- Plug Up (PLP)
- Preset Conference (CONF)
- Primary Interlata Carrier (PIC)
- Random Make Busy (RMB)
- Requested Suspension (RSUS)
- Ring Again (RAG)
- Security Code (SEC)
- Short Timed Release Disconnect (STRD)
- Secondary Language (SL)
- Simplified Message Desk Interface (SMDI)
- Special Billing (SPB)
- Speed Calling Long List (SCL)
- Speed Calling Short List (SCS)
- Station Message Detail Record (SMDR)
- Station Origination Restrictions (SOR)
- Station Origination Restrictions Controller (SORC)
- Station Specific Authcode (SSAC)
- Stop Hunt (SHU)
- Subscriber Line Usage (SLU)
- Suspended Service (SUS)
- Terminating Billing Option (TBO)
- Time and Charge Service on 1+ Calls (ATC)
- Toll Essential Service (TES)
- Uniform Call Distribution (UCD)
- Uniform Call Distribution SD Point (UCDSD)
- Three Way Calling (3WC)

Hardware requirements

This feature requires 500 and 2500 sets to be attached to the Meridian SL-100 version of the IPE peripheral. The IPE must be equipped with an Extended Analog Line Card and an Extended Message Waiting Line Card.

AM0128**Analog lines on IPE (end)**

Limitations and restrictions

The following limitations and restrictions apply to Analog Lines on IPE:

- This feature does not support attendant consoles and attendant console-related features.
- This feature verifies a comprehensive set of station features and a representative set of system features. All station and system features function properly on 500 and 2500 sets residing on the IPE.

Interactions

Analog Lines on IPE has no functionality interactions.

Datafill

Tables LNINV and IBNLINES are enhanced to support the datafilling of LENS associated with IPE analog lines. Field CARDCODE in table LNINV now supports the two new IPE analog card codes, 8D03AB and 8D09AB. A check has been added to ensure that the IPE LEN being added is correctly datafilled in table LNINV with one of the IPE analog card codes.

Service Orders

This feature ensures that all existing Service Order and line query commands function correctly when used in conjunction with IPE analog lines.

Operational measurements

Analog Lines on IPE does not affect operational measurements.

Logs

Analog Lines on IPE does not affect logs.

User interface

Analog Lines on IPE does not change the user interface.

Billing

Analog Lines on IPE does not affect billing.

AM0129

XPEC message interface—phase II

Functionality name

XPEC Message Interface—Phase II

Description

This feature enables the Extended Peripheral Equipment Controller (XPEC) to:

- translate analog set messages from the XMS-based Peripheral Module (XPM) and send them to the Extended Message Waiting Line Card (XMLC) or Extended Analog Line Card (XALC). Messages to analog sets are translated from DMS-X format to A10 format.
- translate analog set messages from the XMLC or XALC card and send them to the XPM. Messages from analog sets are translated from A10 format to DMS-X format and sent to the XPM.
- support Intelligent Peripheral Equipment (IPE) overload control. Overload control processing allows the XPM to receive information regarding the state of IPE messaging memory use.
- support the use of two transceivers on the RSIG (Receive Signaling) S71 chip. The RSIG chip is programmed to enable the interrupts on two transceivers. Both transceivers of the RSIG chip are used, subject to the link open or closed state of each.

This feature supports transmission and reception of DMS-X messages over the DMS-X link and handles error conditions. Messages are received on two DMXS message channels and routed to the appropriate processes within the IPE.

Analog message processing

This feature supports the following analog set messages:

- Ring On
- Ring Off
- Message Waiting On (XMLC only)
- Message Waiting Off (XMLC only)
- On-hook
- Off-hook
- Digit 0-9 Selected
- Hookswitch Flash

AM0129**XPEC message interface—phase II** (continued)

Overload control support

Overload control is a method of controlling message flow to and from the IPE. Overload control provides continued processing of calls at maximum capacity during peak traffic periods. Messages from in-progress calls experience minimal delays in the XPM, while calls being originated during an overload condition can encounter dial tone delays because of delays in the XPM.

Overload control bytes are added to each DMS-X set message sent to the XPM. These bytes signify the percentage of available memory that is free from the pool that the IPE uses to transmit and receive messages. Two time stamp bytes are included in each DMS-X messages sent to the XPM to enable correct Dial Tone Speed Recording (DTSR) computation. These time stamp bytes are the value of the system clock in the XPEC.

Overload audit reports are generated and sent to the XPM when the IPE detects that messages, either C-side or P-side, are dropped. The overload audit reports are sent to the XPM every five minutes, as long as the message dropping condition persists. The report includes the overload status, the C-side and P-side message lost counters, and the sequence number of the ongoing overload cycle.

RSIG multiple transceiver support

The RSIG chip can transmit and receive using one or two transceivers. This feature supports the use of two transceivers to transmit and receive messages to or from the XPM. One DS30A channel is assigned to each transceiver. Each transceiver has both a status and a control register, transmit and receive buffers, state machines to control the protocol for transmitting and receiving, and Cyclic Redundancy Check (CRC) generation and checking.

The following conditions apply to the support of two RSIG transceivers:

- Both transceivers receive and transmit data.
- Link statistics are maintained.
- Link error conditions are detected and reported.
- If one of the transceivers is disabled, the other enabled transceiver takes over all of the transmit and receive responsibilities.

Hardware requirements

This feature runs on the XPEC card and is downloadable.

AM0129

XPEC message interface—phase II (end)

Limitations and restrictions

Overload control processing is dependent on the size of the memory heap available in the IPE software.

Interactions

XPEC Message Interface—Phase II has no functionality interactions.

Datafill

XPEC Message Interface—Phase II does not affect data schema tables or office parameters.

Service Orders

XPEC Message Interface—Phase II does not affect SERVORD.

Operational measurements

XPEC Message Interface—Phase II does not affect operational measurements.

Logs

XPEC Message Interface—Phase II does not affect logs.

User interface

XPEC Message Interface—Phase II does not change the user interface.

Billing

XPEC Message Interface—Phase II does not affect billing.

AM0130

XPEC call processing—phase II

Functionality name

XPEC Call Processing—Phase II

Description

This feature enhances the software for the Intelligent Peripheral Equipment (IPE) in the Meridian SL-100 environment to provide the following functions:

- ringing support for analog line cards
- network side connection loopback
- re-enabling of disabled babbling sets
- support for the line data message

Ringing support for analog line cards

This feature provides software to support station set ringing on the XMLC analog line card. The software is modified to check the card type of a station set when it receives a ring command from the Central Control (CC). Ring-on and Ring-off commands are sent to analog sets using the A10 message format. Ring commands to digital sets are sent in X12 format.

An analog station set requires the use of a ring generator while its ringer is on. The ring generator is capable of ringing a maximum of eight sets at one time. Logic is added to the ringing cadence to stagger analog station set ringing so that as many as 24 sets can actively ring at one time. Analog station sets that require ringing when the ring generator is saturated are placed in a ring waiting queue until ring generator resources become available, or until a stop ringing command is received from the CC.

Network side connection loopback

The IPE periodically receives messages that cause a DS30A channel to loop upon itself, as well as messages that disconnect a loopback connection. These messages are similar to the regular MAKE CONNECTION and BREAK CONNECTION messages, but with logic added. The MAKE CONNECTION message specifies a loopback by specifying a second C-side port and channel number. In a normal MAKE CONNECTION message, the second C-side port and channel fields contain a null value.

When a loopback command is recognized, the specified DS30A port and channel are connected to one of the unused DS30X channels on the peripheral side of the Time Slot Interface Chip (TSIC). A table keeps track of the DS30X channels that are available for use in a loopback connection. Each time a Break Connection message is received, the connection is checked to determine

AM0130

XPEC call processing—phase II (continued)

if the specified connection is in a loopback. If a connection is looped, it is disconnected and the DS30X loopback channel is marked “available for use”. The TSIC audit function is modified to support loopback connections.

Re-enabling babbling sets

When a babbling set is detected, it is disabled and a BABBLE REPORT message is sent to the XMS-based Peripheral Module (XPM). Under normal circumstances, the IPE receives a command from the XPM to disable the station set. This feature adds software logic to return a station set to service that has been marked as a babbling set. It disables the set if the XPM does not respond to the BABBLE REPORT message with a DISABLE SET command within 30 seconds.

The software keeps a list of station sets that have been marked as “babblers”. This list contains a time stamp marking the time the set was disabled. Elements of the babbler list are removed when a DISABLE SET command is received for the corresponding station sets. The babbler list is scanned periodically to determine if a set has been on the list for more than 30 seconds. If a set that has been disabled for more than 30 seconds is found in the list, it is re-enabled and removed from the babbler list.

Supporting the line data message

Software is added to process the Line Data message from the CC. This message is sent to the IPE after a warm activity switch (SWACT) occurs to ensure agreement between the IPE and the CC as to the state of each circuit on the IPE. The Line Data message contains a bit map that defines the state of each circuit. This state information is compared to the time switch connection information in the IPE to ensure that they match. If a circuit is connected in the IPE but is not connected as defined by the Line Data messages, the circuit is disconnected in the IPE. In this way, calls that have not reached talking stage when a SWACT occurs are disconnected.

Hardware requirements

This software runs on an IPE.

Limitations and restrictions

The following limitations and restrictions apply to XPEC Call Processing—Phase II:

- Only the Extended Digital Line Card (XDLC) and Extended Message Waiting Line Card (XMLC) card types are supported.
- No intraswitching is supported in the XPEC.

AM0130**XPEC call processing—phase II (end)**

- No more than 24 analog sets can ring at one time.
- No more than 61 connections can be looped back at one time.

Interactions

This feature interacts with the following features in the XPEC:

- XPEC Message Interface—Phase II (AM0129)
- XPEC Maintenance—Phase II (AM0124)
- PMDEBUG Interface to XPEC Monitor (AM0135)
- DTSR Audits for IPEs (AM0134)
- IPE Lines Maintenance—Phase II (AM0126)

Datafill

XPEC Call Processing—Phase II does not affect data schema tables or office parameters.

Service Orders

XPEC Call Processing—Phase II does not affect SERVORD.

Operational measurements

XPEC Call Processing—Phase II does not affect operational measurements.

Logs

XPEC Call Processing—Phase II does not affect logs.

User interface

XPEC Call Processing—Phase II does not change the user interface.

Billing

XPEC Call Processing—Phase II does not affect billing.

AM0131

XPM IPE interface optimization

Functionality name

XPM IPE Interface Optimization

Description

This feature defines the interface between an XMS-based Peripheral Module (XPM) and the Extended Peripheral Equipment (XPE) peripheral that supports connections to a Meridian SL-100 switch. The interface between the XPM and XPE consists of numerous messages that are necessary to load, return to service, provide call processing information, and maintain the operating state of the peripheral. This feature identifies the messages that are common to the Line Concentrating Module (LCM), Digital Line Module (DLM), and the XPE peripherals. The three kinds of messages that define the interface between an XPM and the XPE peripheral are maintenance, call processing, and miscellaneous messages.

Maintenance messages include the following:

- busy
- load
- return to service
- test
- status
- drawer data
- line data

Call processing includes the following:

- ringing
- set cadence
- make connection
- break connection

Miscellaneous messages include the following:

- Dial Tone Speed Recording (DTSR)
- overload control
- babblers

AM0131**XPM IPE interface optimization** (continued)

- tones
- XPM Bit Error Rate Tests (XBERT)

Because of the hardware differences between the XPM to XPE interface and the LCM and DLM configuration, existing messages were modified specifically for the XPM to XPE interface.

The following message formats are used between the DMS Central Control and the different levels of peripherals:

- external DS30 format to the network
- external DMSX format to the LCM
- internal DS30/DMSX format to the LGC tasks

The external DS30 message format consists of an eight-byte header, 55 bytes of data, and a checksum (one byte). The external DMSX message format consists of a 6-byte header, 55 bytes of data and a 1-byte checksum. The internal DS30/DMSX message format consists of the 8-byte header and the data (55 bytes).

Hardware requirements

XPM IPE Interface Optimization has no hardware requirements.

Limitations and restrictions

XPM IPE Interface Optimization has no limitations or restrictions.

Interactions

XPM IPE Interface Optimization has no functionality interactions.

Datafill

XPM IPE Interface Optimization does not affect data schema tables or office parameters.

Service Orders

XPM IPE Interface Optimization does not affect SERVORD.

Operational measurements

XPM IPE Interface Optimization does not affect operational measurements.

AM0131

XPM IPE interface optimization (end)

Logs

XPM IPE Interface Optimization does not affect logs.

User interface

XPM IPE Interface Optimization does not change the user interface.

Billing

XPM IPE Interface Optimization does not affect billing.

AM0132**Overload control for IPEs**

Functionality name

Overload Control for IPEs

Description

This feature provides overload control for IPEs (Intelligent Peripheral Equipment). Overload control consists of overload protection and overload indicators.

Overload Protection

Overload protection regulates the message flow between an IPE and its host XPM (XMS-based Peripheral Module). The XPM performs Origination Shedding, also called Origination Flow Control, which is a procedure that postpones the processing of new calls sent from an overloaded peripheral. This prevents the use of any more resources on new calls. The saved resources are then reserved for calls in progress. A sophisticated flow control in the XPM manipulates call processing messages according to call priorities. The flow control system automatically provides progress message favoring, a system that gives preference to calls in progress over new calls.

The IPE informs the host XPM when Origination Shedding should be applied. Each flow task message that is sent to the host XPM contains a load state indicator. This indicator is filled in with the information on the current load state. After receiving the flow task message, the XPM examines and interprets the load state indicator to determine the available call processing data store left in the IPE. If the load state indicator of an IPE reaches or goes beyond the predefined overload level, the host XPM carries out the following actions:

- determines the IPE to be overloaded and sets its internal state to In-Service Trouble (ISTB)
- queues up any new incoming line origination messages conveyed from the overloaded IPE
- places the queued line origination messages to another appropriate queue under the Guaranteed Dial Tone (GDT) system of the flow control. These messages are continuously placed at the back of the queue until the IPE is out of overload state.

These line origination messages are not processed until the corresponding IPE load is reduced. When the IPE is no longer in a high load condition, the next flow task message is sent from the IPE to its host XPM, indicating a normal traffic condition in the load state indicator fields. If the IPE does not transfer any flow task messages after it comes out of overload and there have been no

AM0132

Overload control for IPEs (continued)

messages from the IPE for the past three seconds, the GDT audit in the XPM returns an overload IPE back to in-service state.

At times of high peak traffic load, the Overload Control for IPEs regulates the flow of messages between the overloaded IPE and its host XPM. The IPE concentrates on processing work that is less time consuming and work that has higher priority, such as termination messages. Therefore, the IPE can have a rapid recovery from the overload level to a stable condition by regaining its data store.

Overload indicators

When an IPE goes into overload, it gives one of the following kinds of overload indications:

- Maintenance and Administration Position (MAP) display
- logs
- Operational Measurements (OMs)

MAP display

The QUERYPM (Query PM) command with FLT (Fault) option in the MAP display's IPE level displays a posted IPE with the fault conditions caused by an overload situation.

Logs

If new messages arrive from the host XPM or the P-side of the IPE when the IPE is in danger of running out of data store, there is the possibility that messages might be discarded. If this occurs, the IPE sends an exception report to inform the CC (Central Control) through XPM about the number of messages that have been lost between the XPM and the IPE and between the IPE and the P-side of the IPE. The following logs are then generated:

- PM180 to indicate that the IPE has just entered overload with the number of lost messages
- PM128 to indicate the change of IPE state from INSV to ISTB when an IPE enters overload. This action applies only if the current state is INSV and there are no other situation that may affect the IPE to change from INSV to ISTB.
- PM180 to display the number of lost messages for an overloaded IPE on a predefined time basis until the number is clear (zero) within the last period
- PM180 to state that the IPE is out of the overload
- PM106 to indicate the change of the IPE state from ISTB to INSV when the IPE is out of overload. This action applies only if the current state is

AM0132**Overload control for IPEs (continued)**

ISTB and there are no other situations in the IPE that could keep the IPE in ISTB state.

Operational Measurements

The OM group PMOVL D consists of the Origination Denied (PORGDENY) and Termination Denied (PTRMDENY) fields. These fields provide information on originations and terminations that are denied in either the CC or the XPM during overload. Each IPE peripheral is one of the keys to OM group PMOVL D. The PORGDENY OM message that contains the PORGDENY OMs of the peripherals is sent every 3 minutes from the XPM to the CC. The PORGDENY for an IPE peripheral is pegged under various internal flow control denial conditions manipulated by the XPM flow control system.

These internal conditions include the following:

- shedding stale messages in various queues
- exceeding the maximum allowable number of messages for an originating or terminating terminal
- shedding old origination messages for the new originations
- losing originations because the resources are completely used up by terminations
- losing call processing messages due to unavailability of resources for queueing new work

This feature extends the existing OMSHOW CI command by allowing a terminal on a switch to have immediate display of information on origination denial tuples in OM group PMOVL D.

Hardware requirements

Overload Control for IPEs has no hardware requirements.

Limitations and restrictions

At times of high peak traffic load, the flow control for IPEs may not be sufficient to prevent IPEs from running out of data store.

Interactions

This feature works with the capabilities provided by XPEC Message Interface-Phase II (AM0129), IPE PM Maintenance-Phase II (AM0033), IP PM Maintenance-Phase I (AM0037), IPE PM Maintenance-Phase III

AM0132

Overload control for IPEs (end)

(AM0125), and other related features. This feature also works with the existing XPM flow control system.

Datafill

Overload Control for IPEs does not affect data schema tables or office parameters.

Service Orders

Overload Control for IPEs does not affect SERVORD.

Operational measurements

No new OM groups or fields are introduced with this feature. However, this feature introduces the existing OM group PMOVL D with an IPE peripheral as one of its key indexes. This OM group consists of PORGDENY and PTRMDENY. The PORGDENY register for an IPE reflects the origination messages that are shed or denied by the host XPM flow control.

Logs

No logs are introduced with this feature. Existing PM128, PM106, and PM180 logs are enhanced to indicate the overload state, out of an overload state, and number of lost messages for an IPE. All the existing functions of these logs remain the same as they are.

User interface

No new CI commands are added with this feature. However, the PTRMDENY and PORGDENY registers associated with an IPE peripheral can be displayed in the OM group PMOVL D through the OMSHOW command. The QUERYPM command with the FLT option in the IPE level of a MAP display was enhanced to display a posted IPE with fault conditions caused by an overload situation.

Billing

Overload Control for IPEs does not affect billing.

AM0133
IPE on RCC

Functionality name

IPE on RCC

Release applicability

IPE on RCC was introduced prior to BCS31 and is applicable for MSL03 and up.

Description

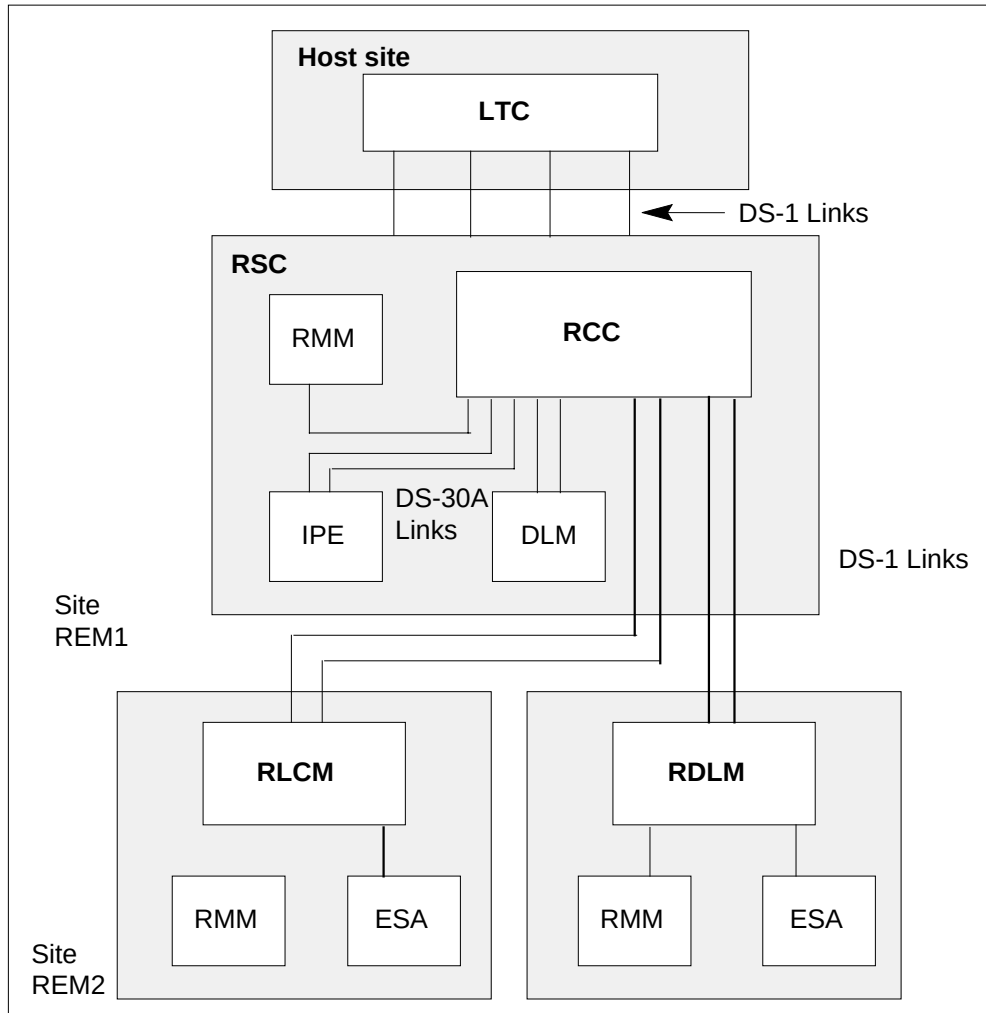
This feature provides the changes to table IPEINV to support the Intelligent Peripheral Equipment (IPE) attached to Remote Cluster Controllers (RCCs), and to table IPEINV to support dynamic Peripheral Module (PM) reconfigurations involving the IPE.

This feature supports host IPE service through an RCC and provides the same level of support as for a host Digital Line Module (DLM). The specific capabilities for Remote Switching Center (RSC) include the following:

- Emergency Stand Alone (ESA) capability for IPE lines (RSC only)
- IPE line to Trunk Intraswitching (normal or ESA mode in RSC only)
- RCC to RCC Interswitching (normal or ESA mode in RSC only)

The same levels of maintenance, diagnostics, and call processing that are supported on XMS-based Peripheral Modules (XPMs) for the IPE are supported on the RCC as well. This includes Integrated Voice and Data (IVD) digital sets along with the Meridian Asynchronous Data Option (MADO) and the Meridian Programmable Data Adapter (MPDA), as well as 500/2500 analog sets. No hardware modifications to the current IPE shelf are necessary for RCC support.

ESA is an emergency service option of the RCC for providing a subset of call processing capabilities in the event of loss of communications with the host. The RCC is a peripheral that is remotely connected to a host Line Trunk Controller (LTC) through DS-1 links. It is capable of handling up to nine LCMs (Line Controller Modules), DLMs or IPEs, or a combination of the three. While an RCC is primarily designed to provide terminations for remote lines, the RCC also supports a limited range of DS-1 trunk circuits to service these lines. A typical RSC configuration is shown in the following figure.

AM0133**IPE on RCC** (continued)**DLM Configuration**

Additional software running both in the CC and RCC provides ESA functions. If a customer subscribes to the ESA option, the package that provides the ESA capability, NTX149AA, is included in the CC software. This package also provides the option of enabling and disabling ESA, which is controlled by changing an entry in the RCCINV table. Because both RCC units are equipped with the same version of the software, ESA capability exists in both RCC units.

Intraswitching

Intraswitching is an optional capability on the RCC that provides call processing capabilities without using CC network resources or DS-1 link

AM0133
IPE on RCC (continued)

resources. For call processing purposes, the RCC is viewed as an LTC with 16 DS-1 host network ports. The speech bus of the RCC contains 32 channels per port. Each equipped DS-1 port utilizes 24 channels for speech and one channel for signaling. The remaining seven channels are looped back for intraswitching. All 32 of the channels on each unequipped port are also looped back for intraswitching purposes.

Additional software provides the intraswitching functions running in the CC and RCC. The intraswitching option is enabled or disabled by changing an entry in the RCCINV table. Because both RCC units are equipped with the same version of the software, intraswitching capability exists in both RCC units.

Automatic Static Data Updates

This feature expands the existing table control and static data downloading software for table IPEINV and enables certain reconfigurations of the IPE and its links. This feature reduces the manual activity required to perform these reconfigurations by sending only the required data to the XPMs. This reduces the amount of time and number of messages required to reconfigure an IPE. The data configuration is treated separately from the rest of the static data. Automatic in-service updates of the configuration data are supported in CPMs that currently support IPEs, such as Line Group Controllers (LGCs), Line Trunk Controllers (LTCs), and RCCs.

This feature does not eliminate the static data mismatch In-Service Trouble condition. It also does not eliminate certain restrictions in table control that require resources to be in certain states to reconfigure. This means that all existing table control restrictions on data changes still apply.

Hardware requirements

Analog line cards and ring generators are required to support the 500/250 analog set.

Limitations and restrictions

The following limitations and restrictions apply to IPE on RCC:

- This feature does not support the following capabilities:
 - using the RCCs Remote Maintenance Module (RMM) for IPE lines
 - warm entry or exit of ESA for IPE lines
- An RCC supports only a co-located (host) IPE. A remote IPE does not exist. Therefore, the IPE C-side link must be the DS-30A type.

AM0133

IPE on RCC (continued)

- All table control restrictions to the reconfiguration of nodes and links that previously existed still apply. This feature is limited to supporting the in-service updates of configuration data resulting from the following table control modifications:
 - C-side link reconfiguration
 - node reconfiguration
 - ringing data changes
- When changing an IPE from one XPM to another (for example, LTC to RCC or LTC to LTC), reload the IPE to bring it back into service. Because call processing uses the configuration data, any dynamic changes to the data can clear calls.

Interactions

This feature interacts with feature BC1228, Audit XPM Data. It uses the audit software to recalculate the XPM data checksum after the static data update is completed. Because data changes are being made to in-service XPMs, call processing may be affected during the updates. Dial tone is sometimes slow during the update process, but normal call processing returns after completion of the update.

Datafill

In table IPEINV, the field for the assignment of the C-side node has been changed to allow datafill of an IPE on an RCC.

Service Orders

IPE on RCC does not use SERVORD.

Operational measurements

Intraskipped OMs are pegged for intraskipped calls on IPE lines.

Logs

IPE on RCC does not affect logs.

User interface

When the TRNSL C command is issued at the IPE level of the MAP display and the IPE posted is attached to an RDD, the name of the RCC displays along with the link numbers and link states. Conversely, when the TRNSL P command is issued at the RCC level and the RCC posted has one or more IPEs attached to it, the name of the IPEs are displayed along with the link names and link states.

AM0133
IPE on RCC (end)

For PM reconfiguration, at the MAP display where the C-side XPM is posted, only the words "Static Data" appear in the maintenance status area to the right of the posted XPM. The MTCE flag also appears momentarily for each affected unit.

Billing

IPE on RCC does not affect billing.

AM0134

DTSR audits for IPEs

Functionality name

DTSR Audits for IPEs

Description

This feature has three purposes:

- to add the Dial Tone Speed Recording (DTSR) capability for the Intelligent Peripheral Equipment (IPE)
- to provide line audits for the IPE
- to provide Peripheral Maintenance (PM) audits for the IPE

Analog (500/2500) and IVD (Integrated Voice and Data) digital lines on the IPE are included in the existing DTSR collection routines. These routines collect statistics on how soon dial tone is given after an off-hook state has been detected. A dial tone delay of greater than 3 seconds indicates that overall system performance is degrading, which can require corrective action. Analog and IVD digital lines on the IPE are included in the DTSR audit routines, which monitor the lines and attempt to correct any inconsistencies found in areas such as line state and lamp state. The IPE is included in the existing PM audit routines, which periodically run on each peripheral. These routines attempt to correct any inconsistencies found in areas such as link state and peripheral state.

Hardware requirements

A Meridian SL-100 peripheral is required.

Limitations and restrictions

DTSR Audits for IPEs has no limitations or restrictions.

Interactions

DTSR Audits for IPEs has no functionality interactions.

Datafill

DTSR Audits for IPEs does not affect data schema tables or office parameters.

Service Orders

DTSR Audits for IPEs does not affect SERVORD.

AM0134

DTSR audits for IPEs (end)

Operational measurements

A new OM group, SITE3, is created in order to make DTSR functional on the IPE for both analog (500/2500) and IVD digital terminals. When the OMSHOW DTSR, OMSHOW DTSRPM, and OMSHOW SITE3 commands are used, new fields are shown for both analog and IVD digital terminals on the IPE.

Logs

DTSR Audits for IPEs does not affect logs.

User interface

DTSR Audits for IPEs does not change the user interface.

Billing

DTSR Audits for IPEs does not affect billing.

AM0135

PMDEBUG interface to XPEC monitor

Functionality name

PMDEBUG Interface to XPEC Monitor

Description

This feature enhances the existing PMDEBUG non-resident debugging tool to allow access to the Extended Peripheral Equipment Controller (XPEC) monitor. It also includes the XPEC software enhancements necessary to support the PMDEBUG interface and to expand the current Monitor command set.

The XPEC supports a maintenance port that is used to interface to a maintenance terminal to monitor the XPEC functions. The monitor allows Nortel personnel to control the maintenance port and execute commands that users issue. The user interface is an ASCII terminal connected to the nine-pin maintenance port interface on the XPEC. This feature also allows users access to the monitor through the non-resident debugging tool PMDEBUG at a Maintenance and Administration Position (MAP) display on the Meridian SL-100 Central Control (CC) Complex. It also enhances the XPEC Monitor command set to provide more debugging and diagnostic capability.

The XPEC monitor is intended for use by skilled Nortel personnel that have thorough knowledge of the XPEC software. Improper use of the monitor can disrupt system operation.

Hardware requirements

The DUART MC68681 Dual Asynchronous Receiver Transmitter chip on the XPEC provides the interface port to the maintenance terminal. An ASCII terminal is required to use the XPEC monitor from the maintenance port. The terminal is connected to the nine-pin RS-232 faceplate connector with the following settings:

- 9600 baud
- eight data bits
- character mode
- no parity

A MAP display is required to use the XPEC monitor with the CC non-resident debugging tool PMDEBUG.

AM0135**PMDEBUG interface to XPEC monitor** (continued)

Limitations and restrictions

The XPEC monitor allows single-user access only. At any time only one user (the PMDEBUG user or the maintenance port user) has access to the XPEC monitor. A mechanism is provided to ensure mutual exclusion and guaranteed accessibility. Guaranteed accessibility means that both the maintenance port user and the PMDEBUG user have the same capability to preempt the current XPEC monitor user.

Interactions

The user interface portion of the XPEC monitor has been modified to accommodate the fact that the PMDEBUG interface is message packed-based while the maintenance port interface is character-based. For the PMDEBUG user, the command line editing is handled by the CC software, which is transparent to the XPEC monitor. The CC uses the break key of a MAP station for I/O and process control. Most control keys and special keys are either ignored or treated literally as input characters. As a result of the capability to allow access to the XPEC Monitor using PMDEBUG, the new message interface interacts with PMDEBUG, the XPEC monitor, and the messaging facilities residing on the CC, the XPM, and the XPEC.

Datafill

PMDEBUG Interface to XPEC Monitor does not affect data schema tables or office parameters.

Service Orders

PMDEBUG Interface to XPEC Monitor does not affect SERVORD.

Operational measurements

PMDEBUG Interface to XPEC Monitor does not affect operational measurements.

Logs

PMDEBUG Interface to XPEC Monitor does not affect logs.

User interface

This feature expands the Monitor command set by implementing new commands and enhancing the existing commands. In addition to the command set enhancements, it also incorporates the message interface into the monitor

AM0135**PMDEBUG interface to XPEC monitor** (continued)

so that it can be invoked at a MAP display through the PMDEBUG tool. The following tables list the new, enhanced, and unchanged monitor commands.

New monitor commands

Command	Purpose
aa	A31 Registers Access
ad	DUART Register Access
add	Add Hexadecimal Numbers
as	S71 Registers Access
ax	XPEC Registers Access
c0 through c9	Command Recall and Re-execution
cv	Command History View
ds	Dump Statistics and Miscellaneous Data
dx, dx1 through dx5	Display Macro Commands
fill	Fill Memory
reset	Reset XPEC
sub	Subtract Hexadecimal Numbers
sx1 through sx5	Set Macro Commands
wb	Write Memory Byte
x1 through x5	Execute Macro Commands

Enhanced monitor commands (Sheet 1 of 2)

Command	Purpose
dc	Dump Card (Peripheral) Status Record
di	Dump IVD Status Record
h	Help
r	Repeat

AM0135**PMDEBUG interface to XPEC monitor (end)****Enhanced monitor commands (Sheet 2 of 2)**

Command	Purpose
r72	Dump R72 Control Memory
smon	Start Message Monitor
w	Write A31 Status

Unchanged monitor commands

Command	Purpose
****	Abort
d	Dump Memory
dmon	Display Message Monitor
m	Message
p	Print Line Priority
qmsg	Queue a message
rmon	Remove Message Monitor
s	Signal Process
wc	Write A31 Status Clear

Billing

PMDEBUG Interface to XPEC Monitor does not affect billing.

AM0140

XPEC self test and diagnostics firmware

Functionality name

XPEC Self Test and Diagnostics Firmware

Description

This feature provides the following functions in the Intelligent Peripheral Equipment (IPE) in the MSL-100 environment:

- power-up self test and clock synchronization
- two communications channels to which the IPE responds that allow it to act upon reset, status, test, load check, and run messages from the Central Control (CC)
- out-of-service board level diagnostics
- handling of hexadecimal display functions

Power-up diagnostics tests

At power-up, the XPEC runs a series of self tests. The results of the tests appear on the hexadecimal display. The first two tests are essential for Extended Peripheral Equipment Controller (XPEC) operation. If either of these tests fails, the power-up diagnostics restart. The remainder of the tests are executed after successful completion of the first two tests. The following table lists the power-up diagnostics tests:

Power-up diagnostics tests (Sheet 1 of 3)

Test number	Test name
1	CPU Test
2	CPU memory stack test
3	RAM test
4	R72 N-P switching control memory test
5	R72 P-N switching control memory test
6	R72 NIVD buffer test
7	R72 XIVD buffer test
8	A31 #1 configuration memory test
9	A31 #1 internal TXVM memory test

AM0140**XPEC self test and diagnostics firmware** (continued)**Power-up diagnostics tests (Sheet 2 of 3)**

Test number	Test name
A	A31 #1 internal context memory test phase 1
B	A31 #1 internal context memory test phase 2
C	A31 #1 external buffer test
D	A31 #1 external FIFO test
E	A31 #2 configuration memory test
F	A31 #2 internal TXVM memory test
10	A31 #2 internal context memory test (phase 1)
11	A31 #2 internal context memory test (phase 2)
12	A31 #2 external buffer test
13	A31 #2 external FIFO test
14	W72 peripheral side loopback using A31 #1
15	W72 peripheral side loopback using A31 #2
16	S71 peripheral side continuity test
17	S71 network side continuity test
	Note: Requires a 8 Khz frame pulse and a 5.12 Mhz clock connected to ports 0 or 1 to pass, otherwise it does not execute or report a failed condition.
18	S71 register test
19	S71 simultaneous packet transmission test
1A	R72 P-N quiet code register test
1B	R72 N-P quiet code register test
1C	R72 XIVD loopback buffer test
1D	Sanity timer test
1E	EPROM checksum

AM0140**XPEC self test and diagnostics firmware** (continued)

Power-up diagnostics tests (Sheet 3 of 3)

Test number	Test name
1F	DUART test
20	EEPROM access

Clock Synchronization

After completion of power-up diagnostics, the XPEC attempts to synchronize with one of two network clocks. When lock is established, the display indicates C0 or C1 for successful lock to port 0 or 1. When no lock is established, the XPEC attempts a hitless switch-over to the other clock source and the display continuously indicates CF (clock failure) until establishing a lock. When CF is indicated and lock is re-established, the XPEC reinitializes all peripheral devices. There are a maximum of six physical DS30 links to the IPE numbered 0 through 5. Links 0, 1, 2, and 3 are cabled together with the clock and frame for port 0. Links 4 and 5 are combined with the clock and frame for port 1.

System communication

The IPE shelf is connected to the XPM with a minimum of two DS30A links. The first channel of the first two links is reserved for messaging between XPM and IPE. The XPEC firmware supports simultaneous messaging on both channels. If the XPM or a link failure disables one message channel, the XPEC switches to single channel mode and routes all messages over the remaining active messaging channel.

Expiration of the sanity timer causes an exception report to the XPM, except when diagnostics are running on the sanity timer. Message link 0 is channel 0 of DS30 link 0 and message link 1 is channel 0 of DS30 link 1.

Upon receipt of an out-of-service test message, the XPEC performs a comprehensive diagnostic test on the XPEC circuit pack. The test results appear on the display. The tests in the following table are a subset of the

AM0140**XPEC self test and diagnostics firmware** (continued)

power-up diagnostics tests. They are used for destructive and non-destructive out-of-service tests and can also be called individually by the software.

System communication tests (Sheet 1 of 2)

Test number	Test name
3	RAM test (not applicable for non-destructive tests)
4	R72 N-P switching control memory test
5	R72 P-N switching control memory test
6	R72 NIVD buffer test
7	R72 XIVD buffer test
8	A31 #1 configuration memory test
9	A31 #1 internal TXVM memory test
A	A31 #1 internal context memory test phase 1
B	A31 #1 internal context memory test phase 2
C	A31 #1 external buffer test
D	A31 #1 external FIFO test
E	A31 #2 configuration memory test
F	A31 #2 internal TXVM memory test
10	A31 #2 internal context memory test (phase 1)
11	A31 #2 internal context memory test (phase 2)
12	A31 #2 external buffer test
13	A31 #2 external FIFO test
14	W72 peripheral side loopback using A31 #1
15	W72 peripheral side loopback using A31 #2
16	S71 peripheral side continuity test

AM0140**XPEC self test and diagnostics firmware** (continued)

System communication tests (Sheet 2 of 2)

Test number	Test name
17	S71 network side continuity test Note: Requires a 8 Khz frame pulse and a 5.12 Mhz clock connected to ports 0 or 1 to pass, otherwise it does not execute or report a failed condition.
18	S71 register test
19	S71 simultaneous packet transmission test
1A	R72 P-N quiet code register test
1B	R72 N-P quiet code register test
1C	R72 XIVD loopback buffer test
1D	Sanity timer test
1E	EPROM checksum
1F	DUART test
20	EEPROM access
21	Program store checksum (not applicable for destructive tests)

Display functions

A single red LED is provided on the XPEC faceplate. The LED is turned on when the XPEC is out of service and turned off when the XPEC is in service.

A double digit hexadecimal display on the XPEC faceplate displays card status and diagnostics test results. The following are the possible display combinations while the firmware has control of program execution:

- The four decimal points are turned on when firmware has control of program execution.
- During power-up, all segments of the digit display are listed for one second then turned off.
- D0 is displayed for power-up diagnostics.
- D1 is displayed for destructive out-of-service diagnostics.
- D2 is displayed for non-destructive out-of-service diagnostics.

AM0140**XPEC self test and diagnostics firmware** (continued)

- If the sanity timer test passes the D0 for the power-up, diagnostics are blanked. This happens because the sanity timer resets the board.
- The test number of each power-up or out-of-service test that failed is displayed for one second.
- C0 is displayed if the clock is synchronized to port 0.
- C1 is displayed if the clock is synchronized to port 1.
- CF is displayed if lock cannot be established with either port.
- E1 indicates a RESET message was received.
- E2 indicates a STATUS message was received.
- E3 indicates a TEST message was received.
- E4 indicates a LOAD message was received.
- E5 indicates a LOAD_CHK message was received.
- E6 indicates a RUN message was received.

Hardware requirements

XPEC Self Test and Diagnostics Firmware has no hardware requirements.

Limitations and restrictions

Even though the diagnostics in this feature cover the majority of components, there are some components that can only be tested using system level tests.

Interactions

XPEC Self Test and Diagnostics Firmware has no functionality interactions.

Datafill

XPEC Self Test and Diagnostics Firmware does not affect data schema tables or office parameters.

Service Orders

XPEC Self Test and Diagnostics Firmware does not affect SERVORD.

Operational measurements

XPEC Self Test and Diagnostics Firmware does not affect operational measurements.

AM0140**XPEC self test and diagnostics firmware** (continued)

Logs

The logs in the following table now refer to Intelligent Peripheral Equipment (IPE) in addition to other peripherals.

Sanity timer exception report logs (Sheet 1 of 2)

Log number	Description
PM102	The Peripheral Module (PM) subsystem generates this report when a system request changes a peripheral module to System Busy (SysB). This log notifies of a change of state to SysB.
PM103	The PM subsystem generates this report when a manual request places the peripheral module Off-line (OFFL) from a Manual Busy (ManB) state. This log confirms a change of state for a specific PM to OFFL.
PM104	The PM subsystem generates this report when a manual request changes a peripheral module from Off-Line (OffL) to Unequipped (UNEQ). This log confirms a change of a specific PM to UNEQ.
PM105	The PM subsystem generates this report when a manual request changes a peripheral module state to Manually Busy (MANB) by a manual request. This log confirms a change of state for a specific PM to MANB.
PM106	The PM subsystem generates this report when a system request returns a peripheral module to service (RTS) from a System Busy state, or a manual request returns it to service from a Manual Busy state. This log confirms or notifies of a change of state for a specific PM to in-service.
PM107	The Pm subsystem generates this report when a system request changes a peripheral module state to Central-Side Busy (CBSY). This log notifies of a change of state for a specific PM to CBSY.
PM116	The PM subsystem generates this report when a message error report is received from a peripheral module.
PM117	The PM subsystem generates this report when Trouble (TBL) occurs during a PM operation. This log notifies of a TBL during a PM operation. Text specifies the type of trouble detected.

AM0140**XPEC self test and diagnostics firmware (end)****Sanity timer exception report logs (Sheet 2 of 2)**

Log number	Description
PM128	The PM subsystem generates this report when the PM encounters Trouble (TBL) during normal operation. The PM state changes as a result of a system or manual request. ISTB conditions do not affect service and are resolved by system action. This log is generated as notification of a TBL condition during normal operation.
PM179	The PM subsystem generates this report when a hardware condition affecting normal operation of the DMS or its peripherals occurs. This log supplies information on a PM HW Exception Report.
PM180	The PM subsystem generates this report when a software condition affecting normal operation of the DMS or its peripherals occurs. This log supplies information on a PM Exception Report.
PM181	The PM subsystem generates this report when a PM exception has occurred. This log notifies of a PM exception.

User interface

The user interface associated with the XPEC firmware is the faceplate display.

Billing

XPEC Self Test and Diagnostics Firmware does not affect billing.

AM0145

Collecting PIN Digits in a Centrex Dialing Plan

Functionality name

Collecting PIN Digits in a Centrex Dialing Plan

Description

This feature collects the personal identification numbers (PIN) in conjunction with the authorization code to provide another level of screening. (Currently only security digits and account code digits can be collected in conjunction with a given authorization code when using the IBNXLA AUTH code feature.)

Security digits can be from zero to four digits in length, are assigned per authorization code basis, and are transparent to the end user. They make authorization codes more secure by varying the total authorization code digit length.

Account code digits vary from two to 14 digits in length, but within a customer group, the length is fixed. They make the authorization codes more secure by varying the length of authorization code digits.

The Collecting PIN Digits in a Centrex Dialing Plan feature provides the following:

- supports the collection of PIN digits using the IBNXLA feature AUTH.
- provides station message detail record (SMDR) billing capability to record PIN digits.
- provides the capability of having a single, one-to-four-digit in length, PIN per authorization code.
- provides the capability of having multiple two- or three-digit PINs for each authorization code. Table PINDATA is used (on a switch basis) to support multiple PINs for each authcode.
- provides the capability of generating a LOG to inform the switch administrator of any failures encountered when entering PIN digits.

Hardware requirements

Collecting PIN Digits in a Centrex Dialing Plan has no hardware requirements. No additional data store is required for this feature.

AM0145**Collecting PIN Digits in a Centrex Dialing Plan** (continued)**Limitations and restrictions**

The following limitations and restrictions apply to Collecting PIN Digits in a Centrex Dialing Plan:

- A total of 15 digits are allowed for authcode digits, security digits, PIN digits and account code digits.
- The valid range of PININDEX values is from zero to 8191. Zero through 4095 are reserved for two-digit PINs. 4096 through 8191 are reserved for three-digit PINs. Two- and three-digit PINs cannot be intermixed for the same PININDEX.
- Only two- and three-digit PINs are allowed when validating PINs using the table PINDATA.
- PIN digits values range from zero to nine.
- This feature is not applicable to the ACR feature.
- No billing records are generated when invalid PIN digits are dialed based on the IBNXLA Auth First feature.

Interactions

The following paragraphs describe the interactions between Collecting PIN Digits in a Centrex Dialing Plan and other functionalities.

Reset dialing

When a mistake is made dialing the PIN digits, the caller can enter the * (asterisk) to receive dial tone and redial the digit sequence prompted for by the previous dial tone. Looking at the dialing sequence, if the caller makes a mistake while dialing PIN digits and enters *, then the user has to redial the authorization code and not the feature access code.

Region code screening

In the PIN option, if the PINSTATS field is datafilled as OPTBYREG, and the incoming agent is a line, or if the incoming agent is a trunk without offnet access or without region code, then the scenario is treated as if the option was datafilled as REQUIRED. However, if the incoming agent is a trunk with the region code the same as the one datafilled with the PIN option, PIN digits are not required to be dialed.

Datafill

No new tables or fields are created for this feature. This feature uses tables AUTHCDE and PINDATA extensively. Table AUTHCDE specifies the option for PIN digits. If the field PINSTATS in the table is datafilled as REQUIRED,

AM0145

Collecting PIN Digits in a Centrex Dialing Plan (end)

then PIN digits are expected to be dialed. When PIN digits are required, the field PINSEL can either be datafilled as SINGLE, to indicate that there is only a single PIN associated with the authorization code, or it can be datafilled as MULTIPLE to indicate that there is more than one PIN digit associated with the authorization code. If there are multiple PINs, the PIN digits are stored in the table PINDATA, and the index at which the PIN is stored is datafilled in the field PININDEX of the table AUTHCODE.

Table PINDATA is used to store the PIN digits when there are multiple PIN digits associated with a particular authorization code. Indices zero to 4095 are used to store PIN digits with a length of two, and indices 4096 to 8191 are used to store PIN digits with a length of three. A maximum of 100 PINs for each index for two digits and a maximum of 1000 PINs for each index for three digits can be stored.

Service orders

Collecting PIN Digits in a Centrex Dialing Plan does not affect SERVORD.

Operational measurements

Collecting PIN Digits in a Centrex Dialing Plan does not affect operational measurements.

Logs

Collecting PIN Digits in a Centrex Dialing Plan does not create any new logs. The existing integrated business network (IBN) logs are used to inform the switch administration when any failure is encountered when call processing procedures access the table AUTHCODE or PINDATA.

User interface

Collecting PIN Digits in a Centrex Dialing Plan does not change the user interface.

Billing

Collecting PIN Digits in a Centrex Dialing Plan has not changed billing. When the PIN digits are correctly dialed and the PIN option is set in the table CUSTSMR, then they can be recorded in an SMDR. The SMDR extension record format (#DC) is generated to record the use of PIN digits.

AM0164
Meridian TeleCenter

Functionality name

Meridian TeleCenter

Description

Meridian TeleCenter, a form of software-based telephony (SBT), consists of a series of software applications that transform the personal computer into an intelligent communications management system. With this feature, users use a personal computer to control features of the Meridian modular terminal (MMT), voice messaging features, and other selected third-party applications. Meridian TeleCenter interworks with standard MMT and Meridian programmable data adapters (MPDA) on the MSL-100 switch.

Hardware requirements

NT8X49AC boards are required for this feature to work properly for MMTs served by digital line modules (DLM). This is because of firmware enhancements made on the boards to accommodate the MMT sets (which created the NT8X49AB) and more firmware enhancements made for the Meridian TeleCenter application (producing the NT8X49AC). Special equipment is also necessary to test this feature.

In order to properly inform Meridian TeleCenter about the state or progress of a call, the MSL-100 switch software sends call progress messages to the set and to the Meridian TeleCenter. Call progress messages are not normally sent to every MMT.

Limitations and restrictions

The following limitations and restrictions apply to Meridian TeleCenter:

- If the TELECNTR option is not specified for the MPDA, the Meridian TeleCenter application will not function properly. The Call Manager window may show no DN appearances for the set or the application may abort with a "Driver Communication Error."
- This activity provides support for Meridian TeleCenter on MMTs equipped with MPDAs and served by either DLMs or intelligent peripheral equipment (IPE). The DLM configuration requires the NT8X49AC board in each unit of the DLM.
- The software for this activity is included in optional package NTXQ21AA.

Interactions

Meridian TeleCenter has no functionality interactions.

AM0164

Meridian TeleCenter (end)

Datafill

An option, TELECNTR, is offered for the MPDA. This option indicates that a Meridian TeleCenter application is attached to the MPDA.

Service orders

An option, TELECNTR, is offered for the MPDA. This option may be specified for the MPDA in the NEW, EST, ADD and ADO commands. The new option may also be deleted from the MPDA using the DEO command.

Operational measurements

Meridian TeleCenter does not affect operational measurements.

Logs

Meridian TeleCenter does not affect logs.

User interface

Meridian TeleCenter does not change the user interface.

Billing

Meridian TeleCenter does not affect billing.

AX0374
CLASS on IPE

Functionality name

CLASS on IPE

Description

This feature provides support within the intelligent peripheral equipment (IPE) for the following CLASS features:

- Calling Name Delivery (CNAMD)-including default messages for the blocking features
- Calling Number Delivery (CND)
- Class Message Waiting Indication (CMWI)
- Spontaneous Call Waiting ID Display (SCWID)
- Calling Number Delivery Blocking (CNDB)
- Calling Name Delivery Blocking (CNAB)

To support the above functions, this feature uses the class modem resource (CMR) card that resides in the XPM. By using this card, information relating to CNAMD and CND is sent to the phone between the first and second ring cycle. CND and CNAMD information is then presented at the phone set level.

Hardware requirements

The following hardware is required for this feature:

- extended peripheral module (XPM)
- IPE
- NT8D09 or NT8D03 line cards
- CMR card

The following telephone sets are supported by CLASS on IPE:

- M9316CW, M9417, M9417CW, M9516, M9516CW
- Maestro sets: 1500, 2500, 3500, 4525, 4625
- PowerTouch sets: 225, 250, 350, 360
- Venture Multi-line Communications Systems
- 2500 sets with adjunct displays, M8001, M8003, M8009, M8314, M8417

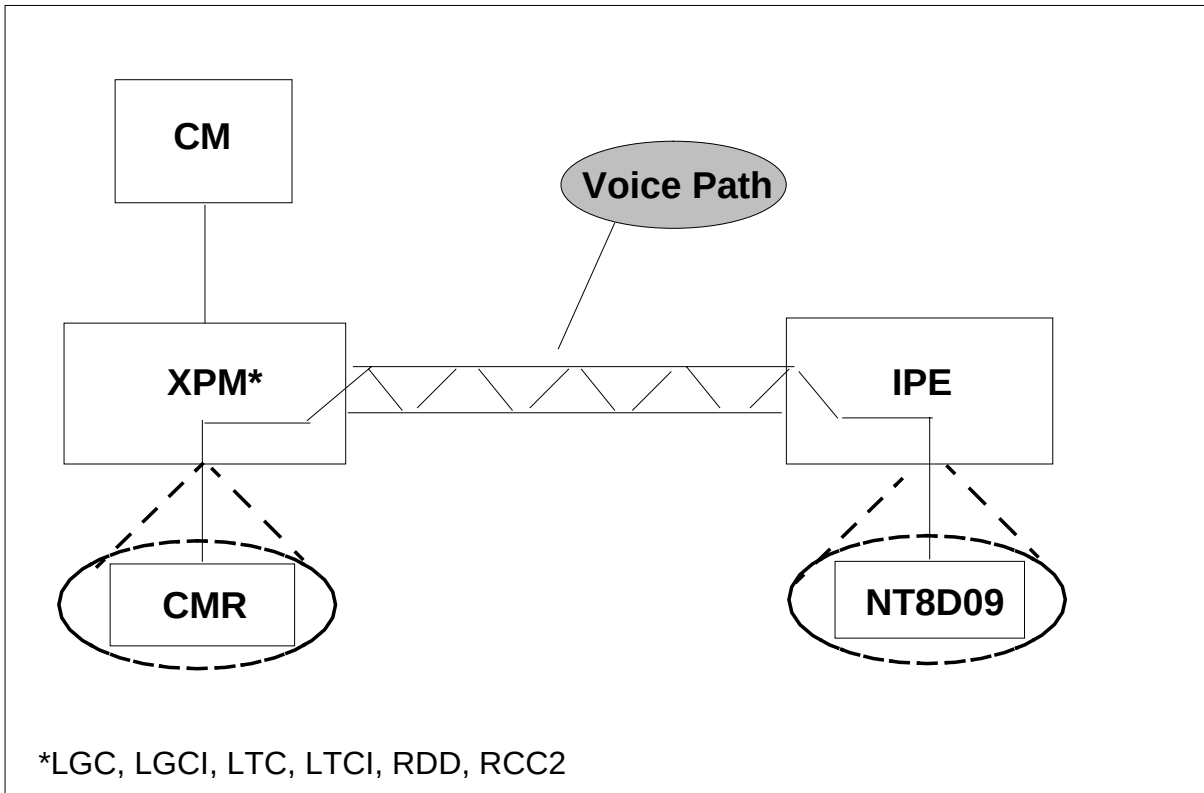
The following figure illustrates the configuration required for this feature to operate properly. It shows that a CMR card is needed within the XPM and at

AX0374

CLASS on IPE (continued)

least one NT8D09 card is needed within the IPE to send CLASS information over the specified voice path.

MSL-100 configuration requirements



Limitations and restrictions

The following are limitations and restrictions for CLASS on IPE.

- Distinctive Ringing Call Waiting (DRCW) is not supported in the IPE environment.
- If a phone misses its immediate ringing resource during the first ringing cycle, the CLASS information is not sent by the CMR card within the XPM. This is because the CMR is not able to detect the ringing on the line within the given time period allotted to it.
- If a ringing generator overload is detected within the IPE during the first ringing cycle, the CLASS information is not sent.
- If the telephone user goes off hook on the telephone between the first and second ringing cycle, the CLASS information is not sent.

AX0374**CLASS on IPE** (continued)

- CND and CNAMD do not support the following ringing types:
 - immediate ringing
 - revertive ringing
- CND and CNAMD do not support secondary MADN members nor secondary HUNT group members. These features use a revertive ringing pattern which is treated with the same urgency as immediate ringing. CND and CNAMD will not be supported for any feature or option whose secondary members require either immediate or revertive ringing patterns.
- CND and CNAMD do not support the M9316 and the M9216 telephone sets.
- The IPE does not support other ringing patterns regarding CND or CNAMD.

Interactions

The following interactions are supported for CLASS on IPE.

- The ringing schema is affected within the IPE because the CMR card is used during the first and second ringing cycle.
- The immediate ring bool within table OFCENG must be set to N in order for the CMR information to send successfully.
- It is possible for an ERROR message to be displayed on an adjunct display if the display does not have time to refresh. This could be due to a change in line state. For example, if a set is in the process of receiving confirmation tone, but the line state changes to display incoming CND or CNAMD information, the adjunct display may not have enough time to recover from the previous line state and the word ERROR will appear.
- A user could experience an extremely short burst of noise (about 0.75 seconds). This is because loss pad data was replaced with an idle code that the CMR card recognizes. To hear this noise, the user must answer the set within the 0.75 seconds range directly following the first ring.

Datafill

CLASS on IPE does not affect data schema tables or office parameters.

Service orders

CLASS on IPE does not affect SERVORD.

Operational measurements

CLASS on IPE does not affect operational measurements.

AX0374

CLASS on IPE (end)

Logs

CLASS on IPE does not affect logs.

User interface

CLASS on IPE does not change the user interface.

Billing

CLASS on IPE does not affect billing.

AX0376**MSL: SMDR Per Use Billing for Features**

Functionality name

MSL: SMDR Per Use Billing for Features

Description

This feature gives MSL-100 system CLASS service providers the ability to offer billing on a use by use basis as opposed to a flat monthly rate. This method is consistent with the way the local telephone company provides billing.

This feature includes four base capabilities.

- usage sensitive SMDR extension record
- SMDR record elements
- activating and deactivating SMDR Per Use Billing extension record
- generation of MSL logs

Universal access to CLASS features

Universal access to CLASS features is supported by feature AX0376. CLASS features accessed using the universal access method generate billing records, providing that AMA billing has been specified for universal access in table RESOFC. The check in table CUSTSMDR is still performed. Because of this checking, a feature accessed universally with AMA billing specified will not generate a billing record if the PERUSE option has not been added in table CUSTSMDR.

How this feature description is organized

This feature description describes the four base capabilities previously stated. Specifically, the section on the usage sensitive SMDR extension record is described in great detail. Topics covered in this section include:

- supported CLASS features
- an example of a DF09 extension record
- a table defining the DF09 record fields
- the byte structure of the DF09 record

AX0376

MSL: SMDR Per Use Billing for Features (continued)

- a table defining the feature codes and the feature events they map to
- details of CLASS feature operations
 - overview of datafill requirements
 - the ACB/AR feature sample datafill, SMDR per use billing records feature codes, and a table with feature code definitions
 - the CLASS display features sample datafill, SMDR per use billing records feature codes, sample logs and DF09 records, and log field definitions
 - the CLASS display feature CNDB
 - the COT sample datafill
 - the screening list features sample datafill, SMDR per use billing records feature codes, a table with feature code definitions, and sample logs and DF09 records
 - the DSCWID sample datafill
 - the BCLID sample datafill and sample log and DF09 records

Usage sensitive SMDR extension record

This feature generates a usage sensitive SMDR extension record (extension code #DF09). This record is based on the same criteria as the per use billing records generated with the bellcore automatic message accounting (AMA) format. This record also stores CLASS feature usage information.

Note: Any set that can have the following CLASS features assigned to, will support SMDR Per Use Billing for Features. Refer to table LCCOPT for CLASS feature compatibility on a per set basis.

The CLASS features supported are

- Automatic Call Back (ACB)
- Automatic Recall (AR)
- Calling Number Delivery (CND)
- Calling Name Delivery (CNAMD)
- Dialable Directory Number (DDN)
- Calling Number Delivery Blocking (CNDB)
- Customer Originated Trace (COT)
- Distinctive Ringing/Call Waiting (DRCW)

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

- Selective Call Acceptance (SCA)
- Selective Call Forwarding (SCF)
- Selective Call Rejection (SCRJ)
- Deluxe Spontaneous Call Waiting Display (DSCWID)
- Bulk Calling Line Identification (BCLID)

The DF09 extension record is shown in the following sample figure. The format of the record is described in table 1. There is an example of the byte structure for the SMDR DF09 extension call record right after table 1.

Sample figure DF09 extension record

```
*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0352 BILL DN:2149975250
EVENT YEAR:1998 EVENT MONTH: 01 EVENT DAY:30 EVENT HOUR:15 EVENT
MINUTE:20 EVENT SECOND:25 NUM AVAIL: 0000 NUM UNAVAIL: 0000 NAME
AVAIL: 0000 NAME UNAVAIL: 0000 CONF PEGS: 0000 SCF LIST SIZE: 0005 SCA
LIST SIZE: 0000 SCRJ LIST SIZE: 0000 DRCW LIST SIZE: 0000 SPARE
DATA1: 0000 SPARE DATA2: 0000
```

Table 1 CLASS per use information extension record field structure (Sheet 1 of 3)

Field name	Description
Record Code	DF (2 nibbles)
Format Code	#09 (2 nibbles)
CLASS Feature Code	This four nibble field indicates the CLASS feature event. Values for this field are listed in the feature code to feature event mapping table.
Billable DN	This ten nibble field contains the DN to bill against.
Event Year	This four nibble field contains a numeric indication of the year the record was generated.
Event Month	This two nibble field contains a numeric indication of the month the record was generated.
Event Day	This two nibble field contains a numeric indication of the day the record was generated.
Note: A nibble is half of one byte, or four bits. Refer to the figure describing the DF09 extension record byte structure.	

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 1 CLASS per use information extension record field structure (Sheet 2 of 3)**

Field name	Description
Event Hour	This two nibble field contains a numeric indication of the hour the event was generated.
Event Minute	This two nibble field contains a numeric indication of the minute the event was generated.
Event Second	This two nibble field contains a numeric indication of the second the event was generated.
Num Avail	This four nibble field shows the number of times calling number information was available and delivered to the phone. This applies to either the CND or DDN CLASS feature that is enabled on a phone without CNAMD. This field shows the number of times that the caller ID information delivered to the phone included the calling name but not the calling number. This applies to the CND or DDN CLASS feature enabled on a phone with CNAMD. This field contains the number of times caller ID information was available and delivered to a phone in a BCLID group. This applies to the BCLID CLASS feature.
Num Unavail	This four nibble field shows the number of times calling number information was unavailable and an unavailable or private message was sent in its place. This applies when either the CND or DDN CLASS feature is enabled on a phone without CNAMD. This field also shows the number of times the caller ID information delivered to the phone included the calling number but not the calling name. This applies when either the CND or DDN CLASS feature is enabled on a phone with CNAMD. This field contains the number of times caller ID information was unavailable and not delivered to a phone in a BCLID group. This applies to the BCLID CLASS feature.
Note: A nibble is half of one byte, or four bits. Refer to the figure describing the DF09 extension record byte structure.	

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 1 CLASS per use information extension record field structure (Sheet 3 of 3)**

Field name	Description
Name Avail	This four nibble field shows the number of times calling name information was available and delivered to the phone. This applies to the CNAMD CLASS feature that is enabled on a phone without a number display option. This field shows the number of times the caller ID information was delivered to the phone and included both the calling name and the calling number. This applies to the CNAMD CLASS feature enabled on a phone with a number display option.
Name Unavail	This four nibble field shows the number of times calling name information was unavailable and an unavailable or private message was sent in its place. This applies when the CNAMD CLASS feature is enabled on a phone without a number display option. This field also shows the number of times that both the name and the number information was unavailable and an unavailable or private message were sent in place of both items. This applies when the CNAMD CLASS feature is enabled on a phone with a number display option.
Conf Pegs	This four nibble field indicates the number of times the conference feature is used in conjunction with the DSCWID CLASS feature.
SCF List Size	This four nibble field indicates the current size of the SCF screening list at the time of record generation.
SCA List Size	This four nibble field indicates the current size of the SCA screening list at the time of record generation.
SCRJ List Size	This four nibble field indicates the current size of the SCRJ screening list at the time of record generation.
DRCW List Size	This four nibble field indicates the current size of the DRCW screening list at the time of record generation.
Spare Data1	This four nibble field is for future expansion.
Spare Data2	This four nibble field is for future expansion.
Note: A nibble is half of one byte, or four bits. Refer to the figure describing the DF09 extension record byte structure.	

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

The following is an example of the byte structure for the SMDR DF09 extension call records.

		BITS										
		NIBBLE		NIBBLE								
		MSB		LSB		field	EXAMPLE					
BYTE		7	6	5	4	3	2	1	0			
1	A			D		B			F	Record code field	A + B = DF	
		1	1	0	1		1	1	1			1
2	C			0		D			9	Format code field	C + D = 09	
		0	0	0	0		1	0	0			1
3	E			0		F			3	CLASS feature code field	E + F + G + H = 0352	
		0	0	0	0		0	0	1			1
4	G			5		H			2			
		0	1	0	1		0	0	1			0
5	I			2		J			1	Billable DN field	I + J + K + L + M + N + O + P + Q + R = 2149975250	
		0	0	1	0		0	0	0			1
6	K			4		L			9			
		0	1	0	0		1	0	0			1
7	M			9		N			7			
		1	0	0	1		0	1	1			1
8	O			5		P			2			
		0	1	0	1		0	0	1			0
9	Q			5		R			0			
		0	1	0	1		0	0	0			0

DF09 extension record byte structure

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

		BITS		field	EXAMPLE
		NIBBLE MSB	NIBBLE LSB		
BYTE		7 6 5 4	3 2 1 0		
10		S 1	T 9	Event year field	S + T + U + V = 1998
		0 0 0 1	1 0 0 1		
11		U 9	V 8	Event month field	W + X = 01
		1 0 0 1	1 0 0 0		
12		W 0	X 1	Event day field	Y + Z = 30
		0 0 0 0	0 0 0 1		
13		Y 3	Z 0	Event hour field	AA + AB = 15
		0 0 1 1	0 0 0 0		
14		AA 1	AB 5	Event minute field	AC + AD = 20
		0 0 0 1	0 1 0 1		
15		AC 2	AD 0	Event second field	AE + AF = 25
		0 0 1 0	0 0 0 0		
16		AE 2	AF 5	Num Avail field	AG + AH + AI + AJ = 0000
		0 0 1 0	0 1 0 1		
17		AG 0	AH 0	Num Unavail field	AK + AL + AM + AN = 0000
		0 0 0 0	0 0 0 0		
18		AI 0	AJ 0		
		0 0 0 0	0 0 0 0		
19		AK 0	AL 0		
		0 0 0 0	0 0 0 0		
20		AM 0	AN 0		
		0 0 0 0	0 0 0 0		

DF09 extension record byte structure (continued)

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

		BITS								
		NIBBLE		NIBBLE						
		MSB		LSB		field	EXAMPLE			
BYTE		7	6	5	4	3	2	1	0	
21	AO	0		AP	0		Name Avail field	AO + AP +		AQ + AR = 0000
	0 0 0 0		0 0 0 0							
22	AQ	0		AR	0		Name Unavail field	AS + AT +		AU + AV = 0000
	0 0 0 0		0 0 0 0							
23	AS	0		AT	0		Conf Pegs field	AW + AX +		AY + AZ = 0000
	0 0 0 0		0 0 0 0							
24	AU	0		AV	0		SCF List size	BA + BB +		BC + BD = 0005
	0 0 0 0		0 0 0 0							
25	AW	0		AX	0		SCA List size	BE + BF +		BG + BH = 0000
	0 0 0 0		0 0 0 0							
26	AY	0		AZ	0		SCRJ List size	BI + BJ +		BK + BL = 0000
	0 0 0 0		0 0 0 0							
27	BA	0		BB	0					
	0 0 0 0		0 0 0 0							
28	BC	0		BD	5					
	0 0 0 0		0 1 0 1							
29	BE	0		BF	0					
	0 0 0 0		0 0 0 0							
30	BG	0		BH	0					
	0 0 0 0		0 0 0 0							
31	BI	0		BJ	0					
	0 0 0 0		0 0 0 0							

DF09 extension record byte structure (continued)

AX0376

MSL: SMDR Per Use Billing for Features (continued)

BITS				field	EXAMPLE
NIBBLE	NIBBLE				
MSB	LSB				
7 6 5 4	3 2 1 0				
BYTE					
32	BK 0 BL 0	SCRJ List size (continued)			BI + BJ + BK + BL = 0000
	0 0 0 0 0 0 0 0				
33	BM 0 BN 0	DRCQ List size			BM + BN + BO + BP = 0000
	0 0 0 0 0 0 0 0				
34	BO 0 BP 0				
	0 0 0 0 0 0 0 0				
35	BQ 0 BR 0	Spare Data1			BQ + BR + BS + BT = 0000
	0 0 0 0 0 0 0 0				
36	BS 0 BT 0				
	0 0 0 0 0 0 0 0				
37	BU 0 BV 0	Spare Data2			BU + BV + BW + BX = 0000
	0 0 0 0 0 0 0 0				
38	BW 0 BX 0				
	0 0 0 0 0 0 0 0				

DF09 extension record byte structure (end)

DF09 extension record byte structure (end)

The following example illustrates a sample portion of the SMDR call record for a call with a DF09 extension record.

DF 09	0352 2149975250 1998 01 30 15 20 25 0000 0000
	0000 0000 0000 0005 0000 0000 0000 0000 0000

The following example illustrates the same data shown in the example immediately above with the detailed CALLDUMP output:

*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0352 BILL DN:21479975250 EVENT YEAR:1998 EVENT MONTH:01 EVENT DAY:30 EVENT HOUR:15 EVENT MINUTE:20 EVENT SECOND:25 NUM AVAIL:0000 NUM UNAVAIL:0000 NAME AVAIL:0000 NAME UNAVAIL:0000 CONF PEGS:0000 SCF LIST SIZE:0005 SCA LIST SIZE:0000 SCRJ LIST SIZE:0000 DRCW LIST SIZE:0000 SPARE DATA1:0000 SPARE DATA2:0000

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

Table 2 shows the feature code to feature event mapping and the conditions required to generate the log or record.

Table 2 Feature code to feature event mapping (Sheet 1 of 6)

CLASS feature code	CLASS feature name and event	Log or record generation condition
0032	AR reactivation - delayed processing	When the feature was deactivated then reactivated and completed after the originator goes on-hook.
0033	ACB reactivation - delayed processing	When the feature was deactivated then reactivated and completed after the originator goes on-hook.
0034	AR reactivation - busy ringback	When the feature was reactivated but was not completed (timed out) because the originator was off-hook. See note.
0035	ACB reactivation - busy ringback	When the feature was reactivated but was not completed (timed out) because the originator was off-hook. See note.
0036	AR reactivation - timeout	When the feature was reactivated but was not completed (timed out) because the originator or terminator was off-hook.
0037	ACB reactivation - timeout	When the feature was reactivated but was not completed (timed out) because the originator or terminator was off-hook.
0038	AR reactivation - deactivation	When the feature was deactivated, reactivated, then deactivated.
0039	ACB reactivation - deactivation	When the feature was deactivated, reactivated, then deactivated.
0052	SCF active	At the end of an SLE session, the SCF feature is currently active and has one or more DNs in its screening list, which previously contained at least one DN.
0060	AR immediate processing	When the feature immediately completes upon activation.
Note: Feature codes 0034, 0035, 0064, 0065, 0076, and 0085 are not supported.		

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 2 Feature code to feature event mapping (Sheet 2 of 6)**

CLASS feature code	CLASS feature name and event	Log or record generation condition
0061	ACB immediate processing	When the feature immediately completes upon activation.
0062	AR delayed processing	When the feature is activated and completes after the originator goes on-hook.
0063	ACB delayed processing	When the feature is activated and completes after the originator goes on-hook.
0064	AR busy ringback	When the feature is activated but is not completed (timed out) because the originator was off-hook. See note.
0065	ACB busy ringback	When the feature is activated but is not completed (timed out) because the originator was off-hook. See note.
0066	AR timeout	When the feature is activated but is not completed (timed out) because the originator or terminator was off-hook.
0067	ACB timeout	When the feature is activated but is not completed (timed out) because the originator or terminator was off-hook.
0068	AR deactivation	When the feature is activated but was deactivated before it could complete.
0069	ACB deactivation	When the feature is activated but was deactivated before it could complete.
0070	COT	Upon feature activation.
0072	SCRJ active	At the end of an SLE session, the SCRJ feature is currently active and has one or more DNs in its screening list, which previously contained at least one DN.
Note: Feature codes 0034, 0035, 0064, 0065, 0076, and 0085 are not supported.		

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 2 Feature code to feature event mapping (Sheet 3 of 6)**

CLASS feature code	CLASS feature name and event	Log or record generation condition
0073	DRCW active	At the end of an SLE session, the DRCW feature is currently active and has one or more DNs in its screening list, which previously contained at least one DN.
0075	CNDB or CNNB activation	Upon feature activation.
0076	Single Activation SCF (SASCF)	Upon feature activation. See note.
0079	SCA active	At the end of an SLE session, the SCA feature is currently active and has one or more DNs in its screening list, which previously contained at least one DN.
0080	CND	At audit interval defined by tuple CIDSUSPAUD in table AMAOPTS.
0081	DDN	At audit interval defined by tuple CIDSUSPAUD in table AMAOPTS.
0082	CNAMD	At audit interval defined by tuple CIDSUSPAUD in table AMAOPTS.
0084	BCLID	At audit interval defined by tuple BCLID_USPAUD in table AMAOPTS.
0085	CNAB	Upon feature activation. See note
0087	CNND	At audit interval defined by tuple CIDSUSPAUD in table AMAOPTS.
0088	Calling Name and Dialable DN Delivery	At audit interval defined by tuple CIDSUSPAUD in table AMAOPTS.
0089	DSCWID	At audit interval defined by tuple DSCWID_CONF_AUDIT in table AMAOPTS.
0095	AR two-level act - first level completion	When the first level of a two-level AR session is completed.
Note: Feature codes 0034, 0035, 0064, 0065, 0076, and 0085 are not supported.		

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 2 Feature code to feature event mapping (Sheet 4 of 6)**

CLASS feature code	CLASS feature name and event	Log or record generation condition
0152	SCF inactive	At the end of an SLE session, the SCF feature is currently inactive and has one or more DNs still in its screening list.
0172	SCRJ inactive	At the end of an SLE session, the SCRJ feature is currently inactive and has one or more DNs still in its screening list.
0173	DRCW inactive	At the end of an SLE session, the DRCW feature is currently inactive and has one or more DNs still in its screening list.
0179	SCA inactive	At the end of an SLE session, the SCA feature is currently inactive and has one or more DNs still in its screening list.
0252	SCF inactive-list deleted	At the end of an SLE session, the SCF feature had its entire screening list deleted.
0272	SCRJ inactive-list deleted	At the end of an SLE session, the SCRJ feature had its entire screening list deleted.
0273	DRCW inactive-list deleted	At the end of an SLE session, the DRCW feature had its entire screening list deleted.
0279	SCA inactive-list deleted	At the end of an SLE session, the SCA feature had its entire screening list deleted.
0352	SCF active-initial list creation	At the end of an SLE session, the SCF feature is currently active and has one or more DNs in its screening list which previously contained no DNs.
0372	SCRJ active-initial list creation	At the end of an SLE session, the SCRJ feature is currently active and has one or more DNs in its screening list which previously contained no DNs.
Note: Feature codes 0034, 0035, 0064, 0065, 0076, and 0085 are not supported.		

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 2 Feature code to feature event mapping (Sheet 5 of 6)**

CLASS feature code	CLASS feature name and event	Log or record generation condition
0373	DRCW active-initial list creation	At the end of an SLE session, the DRCW feature is currently active and has one or more DNs in its screening list which previously contained no DNs.
0379	SCA active-initial list creation	At the end of an SLE session, the SCA feature is currently active and has one or more DNs in its screening list which previously contained no DNs.
0452	SCF inactive-initial list creation	At the end of an SLE session, the SCF feature is currently not active and has one or more DNs in its screening list which previously contained no DNs.
0472	SCRJ inactive-initial list creation	At the end of an SLE session, the SCRJ feature is currently not active and has one or more DNs in its screening list which previously contained no DNs.
0473	DRCW inactive-initial list creation	At the end of an SLE session, the DRCW feature is currently not active and has one or more DNs in its screening list which previously contained no DNs.
0479	SCA inactive-initial list creation	At the end of an SLE session, the SCA feature is currently not active and has one or more DNs in its screening list which previously contained no DNs.
0552	SCF inactive-session aborted	At the end of an SLE session, the SCF feature is currently not active and has no DNs in its screening list which previously contained no DNs.
0572	SCRJ inactive-session aborted	At the end of an SLE session, the SCRJ feature is currently not active and has no DNs in its screening list which previously contained no DNs.
Note: Feature codes 0034, 0035, 0064, 0065, 0076, and 0085 are not supported.		

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 2 Feature code to feature event mapping (Sheet 6 of 6)**

CLASS feature code	CLASS feature name and event	Log or record generation condition
0573	DRCW inactive-session aborted	At the end of an SLE session, the DRCW feature is currently not active and has no DNs in its screening list which previously contained no DNs.
0579	SCA inactive-session aborted	At the end of an SLE session, the DRCW feature is currently not active and has no DNs in its screening list which previously contained no DNs.
Note: Feature codes 0034, 0035, 0064, 0065, 0076, and 0085 are not supported.		

CLASS features operations

The following information assumes that all necessary translations, RESOFC datafill, and maintenance datafill are already available. Only the necessary datafill required for activating the per use billing feature is described.

There is a hierarchy of control levels used to determine if an SMDR per use billing record is generated. On a switch-by-switch basis, the control mechanism is the SUSP tuple in table AMAOPTS. Setting this tuple to OFF will turn off per use billing for the entire switch. Setting this tuple to ON generates per use billing records depending on the further levels of control.

To generate SMDR per use billing records for customer groups use table CUSTSMDR. Every customer group defined on the switch has an entry in this table. For each customer group that is to have SMDR per use billing records generated, the option PERUSE must be added.

To generate SMDR per use billing records on a phone or feature basis set the billing option to AMA when adding the CLASS feature using SERVORD. When SUSP is turned off in table AMAOPTS, SERVORD does not present the billing option prompt when adding one of the CLASS features. Instead, it sets the option to NOAMA by default. When SUSP is turned on in table AMAOPTS, SERVORD presents a billing option prompt after each CLASS feature.

An additional entry must be made in table AMAOPTS for the CLASS features CND, DDN, CNAMD, BCLID, and DSCIWD. The CLASS display features CND, DDN, and CNAMD must have an audit schedule set using tuple CIDSUSPAUD in table AMAOPTS. This tuple controls the interval at which

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MSL: SMDR Per Use Billing for Features (continued)

the switch runs through every phone with one of the CLASS display features added. This tuple also generates a report that gives detailed delivery information. The CLASS features BCLID and DSCWID have similar tuples in table AMAOPTS called BCLID_USPAUD and DSCWID_CONF_AUDIT, respectively.

Using this feature

To generate the logs and records to use this feature, follow these steps.

- Add the option PERUSE to the appropriate customer group in table CUSTSMDR. Set LOGS to Y (generates the MSLSMDR 100 log).
- Turn on the SUSP option in table AMAOPTS.
- Assign one of the CLASS features (listed in the Usage sensitive SMDR extension record section) to a phone in the customer group that has PERUSE assigned to it. Set the billing option to AMA.
- Set an audit interval using tuple CIDSUSPAUD in table AMAOPTS for the CLASS display features CND, DDN, and CNAMD.
- Set an audit interval using tuple BCLID_USPAUD in table AMAOPTS for the CLASS display features BCLID and DSCIWD.
- Duplicate a log or record generation condition (refer to the feature code to feature event mapping table) for the feature assigned to the phone.
- Run CALLDUMP to output the record.

Automatic Call Back/Automatic Recall

The following information describes example datafill, feature codes, and conditions for features ACB and AR. The only fields within the billing record that are important to features ACB and AR CLASS feature code, billable DN, event time, and event date.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Sample datafill for ACB and AR**

```

>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
                                SUSP                                ON
>table custsmdr
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: CUSTSMR
>pos bnrrch
                                BNRRCH                                9
(RAO ) (ANSTIM 15) (MSN) (PIN) (TCN ) (PERUSE Y) $
>qdn 9975200
-----
DN:          9975200
TYPE:  SINGLE PARTY LINE
SNPA:  214   SIG:  DT   LNATTIDX: N/A
LINE EQUIPMENT NUMBER:  LCM0  00  0  11  00
LINE CLASS CODE:  IBN
IBN TYPE: STATION
CUSTGRP:          BNRRCH          SUBGRP: 0 NCOS: 0
CARDCODE:  6X17AC  GND: N  PADGRP: NPDGP  BNV: NL MNO: N
PM NODE NUMBER          :          38
OPTIONS:
ACB AMA AR AMA DGT
-----

```

Table 3 ACB and AR SMDR per use billing records feature codes (Sheet 1 of 2)

Code	Description
0032	AR reactivation - delayed processing
0033	ACB reactivation - delayed processing
0034	AR reactivation - busy ringback (see note)
Note: These feature codes are not supported.	

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

Table 3 ACB and AR SMDR per use billing records feature codes (Sheet 2 of 2)

Code	Description
0035	ACB reactivation - busy ringback (see note)
0036	AR reactivation - timeout
0037	ACB reactivation - timeout
0038	AR reactivation - deactivation
0039	ACB reactivation - deactivation
0060	AR immediate processing
0061	ACB immediate processing
0062	AR delayed processing
0063	ACB delayed processing
0064	AR busy ringback (see note)
0065	ACB busy ringback (see note)
0066	AR timeout
0067	ACB timeout
0068	AR deactivation
0069	ACB deactivation
0095	AR two-level act - first level completion
Note: These feature codes are not supported.	

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 4 SMDR per use billing feature code conditions for ACB and AR (Sheet 1 of 2)**

Feature code condition	Description
Immediate processing	The ACB or AR feature is activated against a DN that is currently idle, allowing the call to go through immediately.
Delayed processing	The ACB or AR feature was previously activated against a DN that was busy. That DN just become idle allowing the call to complete.
Busy ringback	Not supported.
Timeout	The ACB or AR feature was previously activated against a DN, or a DN which activated the feature, that was busy and stayed busy. The length of the busy time was long enough that the background monitor went on longer than the T6 timer value in table RESOFC and timed out, canceling the monitor process.
Deactivation	A previously activated ACB or AR monitor process was just deactivated.
Reactivation - delayed processing	The ACB or AR feature was previously activated against a DN that was busy. The feature was activated again against the same DN, resetting the T6 timer value. The DN became idle and the call was completed.
Reactivation - busy ringback	Not supported.
Reactivation - timeout	The ACB or AR feature was previously activated against a DN that was busy. The feature was activated again against the same DN, resetting the T6 timer. That DN, or a DN which activated the feature, stayed busy. The length of the busy time was long enough that the background monitor went on longer than the T6 timer value in table RESOFC and timed out, canceling the monitor process.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

Table 4 SMDR per use billing feature code conditions for ACB and AR (Sheet 2 of 2)

Feature code condition	Description
Reactivation - deactivation	A previously activated, and subsequently reactivated, ACB or AR monitor process was just activated.
AR two level activation - first level completion	This condition applies to the AR feature only. The AR feature can be set up for two-level activation. The record is generated when moving from level one to level two in a two-level activation scenario.

CLASS display features-CND, CNAMD, DDN

The following describes example datafill, feature codes, and example log information for the CLASS display features.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Sample datafill for CLASS display features**

```

>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
                SUSP                                ON
>table custsmdr
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: CUSTSMDR
>pos bnrrch
                BNRRCH                                9
(RAO ) (ANSTIM 15) (MSN ) (PIN ) (TCN ) (PERUSE Y)  $
>qdn 9975200
-----
DN:          9975200
TYPE: SINGLE PARTY LINE
SNPA: 214 SIG: DT LNATTIDX: N/A
LINE EQUIPMENT UMBER:      LCM0  00  0  11  00
LINE CLASS CODE:  IBN
IBN TYPE: STATION
CUSTGRP:      BNRRCH      SUBGRP: 0  NCOS: 0
CARDCODE:  6X17AC  GND: N  PADGRP: NPDGP  BNV: NL  MNO: N
PM NODE NUMBER      :   38
PM TERMINAL NUMBER  :   353
OPTIONS:
DGT CND AMA CNAMD AMA
-----
>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos cidsuspaud
                CIDSUSPAUD PERIODIC 980226  0000  24  HRS

```

The CLASS display features are a little different from the other CLASS features because the per use billing records are not generated for every use of the feature. Instead, an audit process is set up to collect CLID delivery counts for each phone that has one of these features added to it. At specified intervals defined by tuple CIDSUSPAUD in table AMAOPTS, a record is generated for every phone with a CLASS display feature that shows the number of times

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

CLID information was delivered to that phone. The delivery counts are then reset to zero so that they can accumulate for the next audit interval.

Note: When the CND, DDN, and CNAMD features are added to a line using SERVORD with the AMA option, they function differently from the NOAMA option. The NOAMA option (when the display feature is added to a line) immediately delivers CID information to the phone. When the AMA option, the display feature can be activated and deactivated. Additionally, the user must activate the display feature by an activation code (described in the Residential Enhanced Services portion of the *MSL-100 Translations Guide*) before CID delivery takes place. This gives the user the ability to turn off the display feature if he will be gone for long periods of time. (The Bellcore recommended activation and deactivation codes are *65 and *85, respectively.)

The CIDSUSPAUD tuple in table AMAOPTS controls the generation of audits. In the sample datafill for CLASS display features the audit is set to PERIODIC, with a start date of February 26, 1998, a start time of 0000 (midnight), and an interval of 24 hours. Therefore, starting at midnight on February 26, 1998, a billing record showing CLID delivery counts will be generated for every phone that has one of the CLASS display features added to it. The audit repeats at midnight on every subsequent night.

Table 5 CLASS display features SMDR per use billing records feature codes

Code	Description
0080	CND (Calling Number Delivery)
0081	DDN (Dialable Directory Number)
0082	CNAMD (Calling Name Delivery)
0087	CNND (Calling Name and Number Delivery)
0088	Calling Name and Dialable DN Delivery
Note: Feature codes 0087 and 0088 indicate that both a number delivery feature and a name delivery feature have been added to the phone.	

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Sample MSLSMDR 100 log and SMDR #DF09 extension record**

```

MSLS100 JAN28 14:08:23 0007 INFO SMDR PER USE BILLING LOG
  CLASS FEATURE CODE      = 0087 - CNND (Calling Name and Number Delivery)
  BILLABLE DN              = 2149975200
  EVENT TIME               = 00:00:23
  EVENT DATE               = 02/26/1998
  CLASS DISPLAY INFO DELIVERY COUNTS:
    NUMBER: 0004 AVAILABLE, 0003 UNAVAILABLE
    NAME: 0002 AVAILABLE, 0001 UNAVAILABLE
  DSCWID CONFERENCE PEGS: 0000
  SCREEN LIST SIZE:
    SCF = 0000, SCA = 0000, SCRJ = 0000, DCRW = 0000

*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0087 BILL DN:2149975200
EVENT YEAR:1998 EVENT MONTH:02 EVENT DAY:26 EVENT HOUR:00 EVENT
MINUTE:00 EVENT SECOND:23 NUM AVAIL:0004 NUM UNAVAIL:0003 NAME
AVAIL:0002 NAME UNAVAIL: 0001 CONF PEGS:0000 SCF IST SIZE:0000 SCA
LIST SIZE:0000 SCRJ LIST SIZE:0000 DRCW LIST SIZE:0000 SPARE
DATA1:0000 SPARE DATA2:0000

```

The important fields in the billing records for the CLASS display information are the CLASS feature code, billable DN, and CLASS display info delivery counts. The event date and time are the date and time that the audit was run and have no relation to when the CLID information itself was delivered.

In the sample figure, the record shows that ten calls are made to DN 2149975200. It also shows that both CND and CNAMD have been added to this phone, so the interpretation of the individual fields of the CLASS display info delivery counts section is a little different that it might seem.

To interpret the sample figure, an explanation of the fields is necessary. Note that DDN and CND are mutually exclusive features, and that calling number delivery is used as a description of the process for both CND and DDN. When

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a single instance of CND, DDN or CNAMD is added to a phone, the fields indicate the following as shown in tables 6 and 7.

Table 6 Log field descriptions when CND, DDN, or CNAMD are added to a phone

Field name	Description
NUM AVAIL	Indicates the number of times a call was made and the calling party number was delivered to the phone. This field is zero if only CNAMD is present on the phone.
NUM UNAVAIL	Indicates the number of times a call was made and the calling party number was unavailable or blocked and a private ID or unavailable message was delivered to the phone. This field is zero if only CNAMD is present on the phone.
NAME AVAIL	Indicates the number of times a call was made and the calling party name was delivered to the phone. This field is zero if only CND or DDN are present on the phone.
NAME UNAVAIL	Indicates the number of times a call was made and the calling party name was unavailable or blocked and a private ID or unavailable message was delivered to the phone. This field is zero if only CND or DDN is present on the phone.

Table 7 Log field descriptions when CNAMD and either CND or DDN are added to a phone (Sheet 1 of 2)

Field name	Description
NUM AVAIL	Indicates the number of times a call was made and the calling party name, but not the number, was delivered to the phone.
NUM UNAVAIL	Indicates the number of times a call was made and the calling party number, but not the name, was unavailable or blocked and a private ID or unavailable message was delivered to the phone.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 7 Log field descriptions when CNAMD and either CND or DDN are added to a phone (Sheet 2 of 2)**

Field name	Description
NAME AVAIL	Indicates the number of times a call was made and both the calling party name and number was delivered to the phone.
NAME UNAVAIL	Indicates the number of times a call was made and neither the calling party name nor number were delivered to the phone.

The preceding example shows that ten calls were made to 2149975200. Of those ten, four included only the name, three included only the number, two included both the name and the number, and one included no information.

In addition to the audit process, a per use record is also generated when one of the CLASS display features is removed from a line. This takes care of any CLID information delivery counts that were accrued from the time of the last audit to the time of feature removal.

Customer Oriented Trace

The COT CLASS feature generates billing records with the CLASS feature code of 0070-COT (Customer Originated Trace).

Billing record generation with this feature is very straightforward. It is generated the first time a user activates the COT feature against a previous incoming call. The record is only generated if the trace was fully successful (that is, resulting in a valid calling DN). The record is not generated for subsequent COT activations against the same previous incoming call. Once a new call comes in, a new activation of COT results in the generation of a per-use billing record.

The only fields within the billing record that are of concern for this feature are the CLASS feature code, billable DN, and event time and date.

The following describes example datafill and feature codes information for COT.

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Sample datafill for COT

```
>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
                SUSP                                ON
>table custsmdr
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: CUSTSMDR
>pos bnrrch
                BNRRCH                9
(RAO ) (ANSTIM 15) (MSN ) (PIN ) (TCN ) (PERUSE Y)  $
>qdn 9975200
-----
DN:      9975200
TYPE:    SINGLE PARTY LINE
SNPA:    214  SIG:  DT  LNATTIDX:  N/A
LINE EQUIPMENT NUMBER:    LCM0 00 0 11 00
LINE CLASS CODE:  IBN
IBN TYPE:  STATION
CUSTGRP:   BNRRCH  SUBGRP:  0 NCOS: 0
CARDCODE:  6X17AC  GND:  N  PADGRP:  NPDGP  BNV:  NL MNO:  N
PM NODE NUMBER      :    38
PM TERMINAL NUMBER  :   353
OPTIONS:
COT AMA DGT
```

CLASS display feature-CNDB

The CNDB CLASS feature generates billing records with the CLASS feature code of 0075-CNDB or CNNB activation.

A billing record for this feature is generated every time it is activated on an outgoing call that completes to a terminating agent. It is not generated if the feature access code is dialed without other digits.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

The important fields for this feature within the billing record are the CLASS feature code, billable DN, event time, and event date.

Note: There is an existing CLASS feature CNNB (Calling Name and Number Blocking) that encompasses the functionality of CNDB (Calling Name Delivery Blocking) and CNAB (Calling Name Blocking). A user dialing the activation code for CNNB is in effect activating both CNDB and CNAB on the call. The use of CNNB generates a per-use billing record if one or both of the following conditions occur:

- the phone has CNDB with AMA billing as one of its line options
- CNDB with AMA billing is enabled for universal access

If neither is true, a per-use billing record is not generated.

The following describes example datafill and feature codes information for CNDB.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

```
>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
                SUSP                                ON
>table custsmr
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE:  CUSTSMR
>pos bnrrch
                BNRRCH                                9
(RAO ) (ANSTIM 15) (MSN ) (PIN ) (TCN ) (PERUSE Y) $
>qdn 9975200
-----
DN: 9975200
TYPE: SINGLE PARTY LINE
SNPA: 214 SIG: DT LNATTIDX: N/A
LINE EQUIPMENT NUMBER: LCM 0 00 0 11 00
LINE CLASS CODE: IBN
IBN TYPE: STATION
CUSTGRP: BNRRCH SUBGRP: 0 NCOS: 0
CARDCODE: 6X17AC GND: N PADGRP: NPDGP BNV: NL MNO: N
PM NODE NUMBER : 38
PM TERMINAL NUMBER : 353
OPTIONS:
CNDB AMA DGT
-----
```

Screening list features-SCA, SCF, SCRJ, DRCW

The following describes example datafill, feature codes, and sample log information for the screening list features.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Sample datafill for screening list features (SCA only)**

```

>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
          SUSP                      ON
>table custsmdr
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: CUSTSMDR
>pos bnrrch
          bnrrch          9
(RAO ) (ANSTIM 15) (MSN ) (PIN ) (TCN ) (PERUSE Y) $
>qdn 9975200
-----
DN:      9975200
TYPE: SINGLE PARTY LINE
SNPA: 214   SIG: DT   LNATTIDX: N/A
LINE EQUIPMENT NUMBER: LCM0  00  0  11  00
LINE CLASS CODE: IBN
IBN TYPE: STATION
CUSTGRP:      BNRRCH  SUBGRP: 0  NCOS: 0
CARDCODE: 6X17AC  GND: N PADGRP: NPDGP  BNV: NL MNO: N
PM NODE NUMBER :      38
PM TERMINAL NUMBER :      353
OPTIONS:
SCA AMA INACT $ DGT
-----

```

Table 8 SLE CLASS features SMDR per use billing records feature codes
(Sheet 1 of 2)

Code	Description
0052	SCF active
0072	SCRJ active
0073	DRCW active

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

**Table 8 SLE CLASS features SMDR per use billing records feature codes
(Sheet 2 of 2)**

Code	Description
0079	SCA active
0152	SCF inactive
0172	SCRJ inactive
0173	DRCW inactive
0179	SCA inactive
0252	SCF inactive-list deleted
0272	SCRJ inactive-list deleted
0273	DCRW inactive-list deleted
0279	SCA inactive-list deleted
0352	SCF active-initial list creation
0372	SCRJ active-initial list creation
0373	DRCW active-initial list creation
0379	SCA active-initial list creation
0452	SCF inactive-initial list creation
0472	SCRJ inactive-initial list creation
0473	DRCW inactive-initial list creation
0479	SCA inactive-initial list creation
0552	SCF inactive-session aborted
0572	SCRJ inactive-session aborted
0573	DRCW inactive-session aborted
0579	SCA inactive-session aborted

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Table 9 SMDR per use billing feature code conditions**

Feature code condition	Description
Active	The SLE session is finished, the feature status is active, and the number of entries in the screening list is greater than zero.
Inactive	The SLE session is finished, the feature status is inactive, and the number of entries in the screening list is greater than zero.
List deletion	The SLE session is finished and the screening list has been deleted. This automatically leaves the feature in an inactive state.
Active with initial list creation	The SLE session is finished, the feature status is active, and the screening list was initially created with one or more number of entries.
Inactive with initial list creation	The SLE session is finished, the feature status is inactive, and the screening list was initially created with one or more number of entries.
Inactive-session abort	A screening list editing session is aborted without initially creating a screening list.

Note: Billing records are not generated by the operation of any of the SLE features.

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MSL: SMDR Per Use Billing for Features (continued)

Sample MSLSMDR 100 log and SMDR #DF09 extension record

```
MSLS100 JAN28 14:08:23 0007 INFO SMDR PER USE BILLING LOG
  CLASS FEATURE CODE      = 0379 - SCA activation + list size increase
  BILLABLE DN             = 2149975200
  EVENT TIME              = 17:45:23
  EVENT DATE              = 02/25/1998
  CLASS DISPLAY INFO DELIVERY COUNTS:
    NUMBER: 0000 AVAILABLE, 0000 UNAVAILABLE
    NAME: 0000 AVAILABLE, 0000 UNAVAILABLE
  DSCWID CONFERENCE PEGS: 0000
  SCREEN LIST SIZE:
    SCF = 0000, SCA = 0013, SCRJ = 0000, DRCW = 0000

*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0379 BILL DN:2149975200
EVENT YEAR:1998 EVENT MONTH:02 EVENT DAY:25 EVENT HOUR:17 EVENT
MINUTE:45 EVENT SECOND:23 NUM AVAIL:0000 NUM UNAVAIL:0000 NAME
AVAIL:0000 NAME UNAVAIL: 0000 CONF PEGS:0000 SCF LIST SIZE:0000 SCA
LIST SIZE:0013 SCRJ LIST SIZE:0000 DRCW LIST SIZE:0000 SPARE
DATA1:0000 SPARE DATA2:0000
```

The important fields in the billing records for the CLASS display information are the CLASS feature code, billable DN, event date, event time, and screen list size.

The screen list size fields show the size of the screen list for the particular feature identified by the CLASS feature code at the time of the generation of the record. In the sample log, the record shows the size of the screen list for the SCA feature was increased and the feature itself is in the active state. At the end of the SLE session, the size of the screening list for the SCA feature was 13 entries.

The four screening list size fields are mutually exclusive. Only the field that corresponds to the feature identified by the class feature code will have a valid value. All other fields will be zero.

Deluxe Spontaneous Call Waiting Display

The following describes example datafill information for DSCWID.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Sample datafill for DSCWID**

```

>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
                SUSP                                ON
>table custsmdr
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: CUSTSMDR
>pos bnrrch
                BNRRCH                9
(RAO ) (ANSTIM 15) (MSN ) (PIN ) (TCN ) (PERUSE Y) $
>qdn 9975200
-----
DN:          9975200
TYPE: SINGLE PARTY LINE
SNPA: 214   SIG: DT   LNATTIDX: N/A
LINE EQUIPMENT NUMBER:   LCM0  00 0  11  00
LINE CLASS CODE:   IBN
IBN TYPE: STATION
CUSTGRP:   BNRRCH   SUBGRP: 0  NCOS: 0
CARDCODE 6X17AC  GND: N PADGRP: NPDGP BNV: NL MNO: N
PM NODE NUMBER      :      38
PM TERMINAL NUMBER  :      353
OPTIONS:
DFT DSCWID DAMA CONF $
-----
>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DNOS NOT ALLOWED
TABLE: AMAOPTS
>pos dscwid_conf_audit
                DSCWID_CONF_AUDIT PERIODIC 980226 0000  24      HRS

```

The important fields in the billing records for the CLASS display information are the CLASS feature code, billable DN, and DSCWID conference pegs. The event date and event time are the date and time that the audit was run.

Bulk Calling Line Identification

The following describes example datafill, feature codes, and sample log information for BCLID.

AX0376

MSL: SMDR Per Use Billing for Features (continued)

Sample datafill for BCLID

```
>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos susp
                SUSP                                ON
>table bclidgrp
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: BCLIDGRP
>lis all
1 Y 2149975250 FIRST N N Y Y Y Y (LCM0 00 0 11 00)$
2 Y 2149975350 FIRST N N Y Y Y Y (LCM0 00 0 00 05)$
>qdn 9975200
-----
DN:          9975200
TYPE:  SINGLE PARTY LINE
SNPA: 214  SIG: DT  LNATTIDX: N/A
LINE EQUIPMENT NUMBER:      LCM0 00 0 11 00
LINE CLASS CODE:  IBN
IBN TYPE: STATION
CUSTGRP:      BNRRCH  SUBGRP: 0  NCOS: 0
CARDCODE: 6X17AC  GND: N PADGRP: NPDGP  BNV: NL MNO: N
PM NODE NUMBER      :      38
PM TERMINAL NUMBER  :      353
OPTIONS:
DGT BCLID 0
-----
>table amaopts
MACHINES NOT IN SYNC - DMOS NOT ALLOWED
JOURNAL FILE UNAVAILABLE - DMOS NOT ALLOWED
TABLE: AMAOPTS
>pos bclid_uspaud
                BCLID_USPAUD PERIODIC 980226 0000 24      HRS
```

This feature is different from the other CLASS features because the per use billing records are not generated for every use of the feature. Instead, an audit process is set up to collect BCLID delivery counts for every BCLID group defined in table BCLIDGRP. At specified intervals defined by tuple BCLID_USPAUD in table AMAOPTS, a record is generated for every BCLID group defined in table BCLIDGRP. The delivery counts are then reset to zero so that they can accumulate for the next audit interval.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

Additionally, due to the nature of this feature, the check in table CUSTSMDR is bypassed. Instead, per use billing for each BCLID group is controlled by the USP field of each tuple in table BCLIDGRP.

As previously stated, the BCLID_USPAUD tuple in table AMAOPTS controls the generation of the audits. In the previous BCLID datafill example, the audit is set to PERIODIC. The audit has a start date of February 26, 1998, a start time of 0000 (midnight), and an interval of 24 hours. Therefore, starting at midnight on February 26, 1998, a billing record showing BCLID delivery counts will be generated for every BCLID group in table BCLIDGRP, and the audit will repeat at midnight on every subsequent night.

The BCLID CLASS feature generates billing records with the CLASS feature code 084-BCLID (Bulk Calling Line ID) Delivery.

Sample MSLSMDR 100 log and SMDR #DF09 extension record

```
MSLS100 JAN28 14:08:23 0007 INFO SMDR PER USE BILLING LOG
  CLASS FEATURE CODE      = 0084 - BCLID (Bulk Calling Line ID) Delivery
  BILLABLE DN             = 2149975250
  EVENT TIME              = 00:00:23
  EVENT DATE              = 02/26/1998
  CLASS DISPLAY INFO DELIVERY COUNTS:
    NUMBER: 0462 AVAILABLE, 0287 UNAVAILABLE
    NAME: 0000 AVAILABLE, 0000 UNAVAILABLE
  DSCWID CONFERENCE PEGS: 0000
  SCREEN LIST SIZE:
    SCF = 0000, SCA = 0000, SCRJ = 0000, DRCW = 0000

*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0084 BILL DN:2149975250
EVENT YEAR:1998 EVENT MONTH:02 EVENT DAY:26 EVENT HOUR:00 EVENT
MINUTE:00 EVENT SECOND:23 NUM AVAIL:0462 NUM UNAVAIL:0287 NAME
AVAIL:0000 NAME UNAVAIL: 0000 CONF PEGS:0000 SCF LIST SIZE:0000 SCA
LIST SIZE:0000 SCRJ LIST SIZE:0000 DRCW LIST SIZE:0000 SPARE
DATA1:0000 SPARE DATA2:0000
```

The important fields in the billing records for the CLASS display information are the CLASS feature code, billable DN, and CLASS display info delivery counts. The event date and event time are the date and time that the audit was

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MSL: SMDR Per Use Billing for Features (continued)

run. Since the BCLID feature represents a type of CLID feature, and the delivery counts are for the calling party number, the NUM AVAIL and NUM UNAVAIL fields were reused instead of making a new field heading. The NAME AVAIL and NAME UNAVAIL fields are not used and will always be zero.

In the previous example log and SMDR extension record, the record shows that 749 calls were made to a BCLID group represented by a billable DN of 2149975250. Multiple phones can be in a single BCLID group, and the delivery count is an aggregate of all the phones in the group. Of the 749 calls, 462 had the calling party number information available to deliver, and 287 were blocked or had their CLID information unavailable.

SMDR record elements

The SMDR Per Use Billing extension record contains the following information:

- a code number indicating the CLASS feature event that occurred. The code numbers are listed in the preceding table, Feature code to feature event mapping.
- the DN to bill against
- the date the record was generated (Year 2000 ready)
- the time the record was generated

Activating and deactivating SMDR Per Use Billing extension record

Activating and deactivating the SMDR Per Use Billing extension record is done through datafill in table CUSTSMDR. The addition of a PERUSE option enables the generation of these SMDR records for the customer group for which the option is datafilled.

Generation of MSL logs

An MSL log is created every time an SMDR Per Use Billing extension record (#DF09) is produced. The log contains calling information such as CLASS feature code, billable DN, and date. Refer to the logs section for more information.

Accompanying feature

This feature works in conjunction with feature AX0390, CCM: SMDR Per Use Billing for Features.

Hardware requirements

MSL: SMDR Per Use Billing for Features has no hardware requirements.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)**Limitations and restrictions**

MSL: SMDR Per Use Billing for Features has the following restrictions or limitations.

The DF09 call extension record has the following limitations:

- Datafill appropriately all translations for the CLASS features that this record supports.
- Add the PERUSE option to the appropriate customer groups in table CUSTSMDR.
- Turn on the SUSP option in table AMAOPTS.
- Set AMA as the billing type when adding CLASS features through SERVORD.
- Set an audit interval using tuple CIDSUSPAUD in table AMAOPTS for the CLASS display features CND, DDN, and CNAMD.
- Set the USP option for the appropriate tuple in table BCLIDGRP for the CLASS feature BCLID. Set an audit interval using tuple BCLID_USPAUD in table AMAOPTS.
- Set an audit interval using tuple DSCWID_CONF_AUDIT in table AMAOPTS for CLASS feature DSCWID.
- The DF09 record is generated using a periodic audit of every phone that has option CND, DDN, CNAMD, DSCWID, and BCLID.
- The DF09 record is generated using activation/deactivation and through editing of the screening list for the SLE features SCA, SCF, SCRJ, and DRCW.
- The DF09 record is not generated when incoming calls are processed by SLE features SCA, SCF, SCRJ, and DRCW.
- The DF09 record is generated through feature activation or operation, or both, for every other supported feature.

Specific datafill instructions and operations for this feature are found in the section CLASS features operations.

Interactions

MSL: SMDR Per Use Billing for Features uses the existing SMDR facilities for generating extension records. No other new interactions are introduced by this feature.

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MSL: SMDR Per Use Billing for Features (continued)

The extension records generated by this feature are accessed using the CALLDUMP utility.

Datafill

The option, PERUSE, is added in table CUSTSMDR, along with a LOGS subfield. The PERUSE option enables and disables the DF09 extension record.

Provisioning information

Note that in all cases, a D1 record is produced immediately before the #DF09 extension record. This should be taken into account when setting any applicable office parameters for memory sizing, as well as for any downstream billing processor. Refer to the *Station Message Detail Recording Reference Guide*, 297-2071-119, for the format of the D1 record. The size of the #DF09 extension record is 39 bytes (38 bytes of formatted data plus a one-byte header). The D1 record preceding a #DF09 is produced as a result of the way the SMDR billing system is built and cannot be removed. The information contained within it is not actual billing information, but zeroed out fields.

The D1 record resembles the following:

```
*REC CODE:D1 CUSTGRP CLLI:004 ORIGTYPE:A ORIGID:2147837000A
DATA CALL ID:A INFO DIGS:40 CONS NO:FF SUBGRP:0 TRM TYPE:A
TRM ID:AAAAAAAAAAAA RTE INFO:0 DAY=107 TIME: HR=08 MIN=28 SEC=51
ELAPSED TIME=000000 ORIG FC:B TERM FC:B CLD NO:9999999999AA
```

As previously stated, this record precedes every #DF09 extension record and can be safely disregarded by a downstream billing processor. It can be distinguished from a valid D1 record by the ORIG FC and the TERM FC fields. These fields will always have a value of B when preceding a #DF09 extension record.

Two other fields within this D1 record also have valid information. These fields are:

- ORIGID—contains the same DN as the billable DN field of the #DF09 extension record
- CUSTGRP CLLI—contains a numerical representation of the customer group of the billable DN.

AX0376**MSL: SMDR Per Use Billing for Features** (continued)

The information in these fields is provided to assist in searching through billing record archives with online search tools. They do not contain any additional information than what is in the #DF09 extension record.

For more information about provisioning, refer to the *MSL-100 Office Parameters Reference Manual*.

Service orders

MSL: SMDR Per Use Billing for Features does not affect SERVORD.

Operational measurements

MSL: SMDR Per Use Billing for Features does not affect operational measurements.

Logs

This feature introduces the MSLSMDR 100 log. It is generated when a feature event occurs (refer to the feature code to feature event mapping table). A sample of the log follows.

```
MSLS100 JAN28 14:08:23 0007 INFO SMDR PER USE BILLING LOG
CLASS FEATURE CODE      = 0070 - COT (Customer Originated Trace)
BILLABLE DN             = 1234567890
EVENT TIME              = 14:08:23
EVENT DATE              = 01/28/1998
CLASS DISPLAY INFO DELIVERY COUNTS:
    NUMBER: 0000 AVAILABLE, 0000 UNAVAILABLE
    NAME: 0000 AVAILABLE, 0000 UNAVAILABLE
DSCWID CONFERENCE PEGS: 0000
SCREEN LIST SIZE:
    SCF = 0000, SCA = 0000, SCRJ = 0000, DRCW = 0000
```

User interface

MSL: SMDR Per Use Billing for Features does not change the user interface.

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MSL: SMDR Per Use Billing for Features (end)

Billing

MSL: SMDR Per Use Billing for Features adds an extension record for SMDR (#DF09). The following is an example of the formatted SMDR per use billing information.

```
*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0352 BILL DN:2149975250
EVENT YEAR:1998 EVENT MONTH: 01 EVENT DAY:30 EVENT HOUR:15 EVENT
MINUTE:20 EVENT SECOND:25 NUM AVAIL: 0000 NUM UNAVAIL: 0000 NAME
AVAIL: 0000 NAME UNAVAIL: 0000 CONF PEGS: 0000 SCF LIST SIZE: 0005 SCA
LIST SIZE: 0000 SCRJ LIST SIZE: 0000 DRCW LIST SIZE: 0000 SPARE
DATA1: 0000 SPARE DATA2: 0000
```

AX0377**MAT GUI & Cabletron Development**

Functionality name

MAT GUI & Cabletron Development

Description

Monitoring and managing the MSL-100 system is done using a MAP terminal or a telnet session. This feature creates three DMS management information bases (MIB) using the standard Simple Network Management Protocol (SNMP) to access and set data on the MSL-100 system using an SNMP client. This data is currently available and accessed through MAP CI commands. The data that the DMS MIB accesses provides the following information:

- userdata
- system tools
- lines

Userdata

This MIB provides general information about the user defined on the MSL-100 system. This MIB has read-only access and provides the following fields:

- Username (string)—the user defined on the system
- Input device (string)—the MAP terminal or telnet device used to log in
- Output device (string)—the output device selected
- Input file (string)—the filename of the file being read
- Output file (string)—the filename of the file being written
- Logged-in (bool)—the logged-in status of the user
- Last logged-in (string)—the date which the user last logged in
- Index (integer)—a hidden field uniquely identifying a user
- Priority (integer)—the priority level of the user
- Stack size (integer)—the stack size for running processes
- Language (string)—the language of choice
- Privilege (string)—the command class(es) the user is permitted to use

AX0377

MAT GUI & Cabletron Development (continued)

System tools

This MIB provides general information regarding the percentage of traffic running on the MSL-100 system and the specific number of the software load. This MIB has read-only access and provides the following fields.

- CPU (int)—a snapshot of the percentage of the CPU utilization on the system
- Image description (string)—a descriptive text of the image name
- ProductName (string)—a descriptive name as described in the Nortel PCA database user interface documents
- Load code (string)—a PCL/PPL load ordering code as described in the Nortel PCA database user interface documents
- Base layer (string)—the context of the base layer used to build image name
- TL layer (string)—the context of the telecom (TL) layer used to build image name
- SHR layer (string)—the release and context of the SHR layer
- CCM layer (string)—the release and context of the CCM layer
- CNA layer (string)—the release and context of the CNA layer
- MSL layer (string)—the release and context of the MSL layer
- STPI layer (string)—the release and context of the STPI layer

Lines

This MIB provides information regarding lines and the directory numbers (DN) available on the line. This data is provided through a Lines and DN table.

The data provided by the Lines table is a partial set of the data stored in table LNINV. In addition to this data, the line class code and line state of the lines are provided. A maintenance column is provided to allow maintenance operations (such as BSY, RTS, OFFLINE) on a line.

The data provided by the DN table is a partial set of the data provided by the DMS QUERY CI command (QLEN). This data is limited to read only operations.

AX0377**MAT GUI & Cabletron Development** (continued)

The following fields are provided for lines.

- LEN (string)—the name of the line equipment number. This five-part name is made up of the site, frame, shelf/unit, lsg/drawer, and circuit parts of the line.
- Card Code (string)—the product engineering code (PEC) of the line card
- Pad Group (string)—the pad group assigned to the line
- Inventory State (integer)—the line inventory availability status of the line
- GND (integer)—a value used to indicate whether the line is GND or LOOP start
- BNV (integer)—a value used to indicate whether the balanced network value needs to be loaded
- Line Class Code (string)—the line class code of the terminal associated with the line
- Line State (integer)—the maintenance status of the line
- Line Set State (integer)—the maintenance operations permitted on the line
- DN (string)—the directory number of the line
- DN SNPA (string)—the serving numbering plan area for this DN
- DN Customer Group (string)—the customer group assigned to this DN
- DN SubGroup (integer)—the sub group assigned to this DN
- DN NCOS (integer)—the network class of service assigned to this DN

Hardware requirements

MAT GUI & Cabletron Development requires ethernet interface unit (EIU) support.

Limitations and restrictions

SNMP compliant network management systems require an EIU to access the MIBs provided by this feature.

Interactions

MAT GUI & Cabletron Development has no functionality interactions.

Datafill

MAT GUI & Cabletron Development does not affect data schema tables or office parameters.

AX0377

MAT GUI & Cabletron Development (end)

Service orders

MAT GUI & Cabletron Development does not affect SERVORD.

Operational measurements

MAT GUI & Cabletron Development does not affect operational measurements.

Logs

MAT GUI & Cabletron Development does not affect logs.

User interface

MAT GUI & Cabletron Development does not change the user interface.

Billing

MAT GUI & Cabletron Development does not affect billing.

AX0378**MSL: Carrier System ID Log Enhancements**

Functionality name

MSL: Carrier System ID Log Enhancements

Description

This feature adds the Carrier Identification (CARID) command to the MAP CI CARRIER level. This ability displays datafillable administrative information.

This feature creates a table called CARID. The administrative information is retrieved from table CARID and allows a technician to quickly retrieve trunk and trouble reporting information.

This feature also appends the datafillable administrative information to specific digital signal (DS1) carrier logs. A blank line is appended to the carrier logs for all layers of this feature. Only the MSL layer overwrites the blank line with the specific carrier information.

When a carrier system fails or an alarm is generated, or both, the MAP display and log message(s) identify the peripherals affected by the failure. The peripherals that could be affected are

- digital trunk controller (DTC)
- ISDN digital trunk controller (DTCI)
- line trunk controller (LTC)
- ISDN line trunk controller (LTCI)
- remote cluster controller (RCC)
- ISDN remote cluster controller (RCC2)
- subscriber carrier module access (SMA)
- enhanced SMA (SMA2)

Previously, when a failure occurred, the technician was required to consult paper records, or print tediously edited files stored in a disk, to determine the failing circuit IDs. The ability to append the DS1 carrier circuit ID to the associated carrier system log message reduces the time required to identify failing circuit IDs. By having this information on-line, technicians performing local and remote maintenance can quickly retrieve necessary information to comprehend the problem and obtain trouble reporting numbers.

The following figure is an example of the output the CARID command could produce.

AX0378**MSL: Carrier System ID Log Enhancements** (continued)**Sample output of CARID command**

CM	MS	IOD		Net	PM	CCS	Lns		Trks		Ext	APPL			
CM Flt	Clock	1	CkEr	Istb	1ESA	.	.	.	1	CC	1	Maj			
M	M	*C*				CR	C	*C*	M			.			
POST	CLASS	ML	OS	ALARM	SYSB	MANB	UNEQ	OFFL	CBSY	PBSY	INSV				
0 Quit_	TRUNKS	0	0	0	0	0	0	87	0	0	84				
2 Post_	REMOTE	0	0	1	2	0	0	0	0	4	20				
3	TIMING	0	0	0	0	0	0	0	0	0	2				
4	DS1														
5 Loop_		N	CLASS	SITE		DTC	CK	D	ALRM	SLIP	FRME	BER	ES	SES	STATE
6 Tst_		0	TIMING			0			0C	0	0<1.0	0	0		INSV
7 Bsy_		1	TRUNKS			0			1C	0	1<1.0	3	0		INSV
8 RTS_		2	TIMING			0			2C	0	0<1.0	0	0		INSV
9 OffL_		3	TRUNKS			0			3C	0	2<1.0	4	0		INSV
10 DispOpt_		4	TRUNKS			0			4C	0	1<1.0	3	0		INSV
11 Disp_		SIZE OF POSTED SET: 20 MORE...													
12 Next		CARRIER:													
13		CARID 3													
14 Detail_		CARID=TRUNK_GROUP_A_DPRK													
15		MISC1=DSX_LOCATION_3_JACK_4													
16		MISC2=TROUBLE_REPAIR_800_555_4444													
17		MISC4=DPRK_LOG_122_123													
18 CarID_															
	JOEB0B														
Time 14:31 >															

Note: Lines 13 through 17 contain the information taken from the CARID table.

Accompanying features

This feature works in conjunction with the following features:

- AX0383, TL: Carrier System ID Log Enhancements
- AX0487, SHR: Carrier System ID Log Enhancements

Hardware requirements

MSL: Carrier System ID Log Enhancements has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to MSL: Carrier System ID Log Enhancements:

- The datafillable administrative information that is entered in table CARID must be contiguous alphanumeric characters or an underscore. No blanks are allowed. If a blank is entered, it ends the input stream.
- This feature appends a blank line to the ISDN 105, PM109, PM110, PM111, and PM186 logs that are initialized with 64 blank characters. Only the MSL layer overwrites the blank if any entry in the MSL layer

AX0378

MSL: Carrier System ID Log Enhancements (continued)

table CARID exists for that specific PM and carrier. All other layers display the blank line.

- The peripheral modules (PM) that can be entered into table CARID include the DTC, DTCL, LTC, LTCL, RCC, RCC2, SMA, and SMA2. Only these peripherals append the table CARID information to the logs. All other peripherals display a blank line.
- The CARID command is unavailable for lower layers.

Interactions

MSL: Carrier System ID Log Enhancements has no functionality interactions.

Datafill

Table CARID is created and datafilled with the information pertinent to the local and far end. The key fields are the peripheral, peripheral number, carrier number, and entry. The entry is used as an index into table CARID. Entries of CARID are considered the primary entry and only the primary entry is appended to the logs. The other entries (MISC1, MISC2, MISC3, and MISC4), if datafilled, are available using the CARID command or the table itself. The CARID table is datafilled to contain the exact text that is to be appended to the existing carrier log messages. The text is displayed with the newly created MAP CI CARRIER level CARID command. (See the previous figure for an example of the CARID command output using the information datafilled in table CARID.) Only ASCII alphanumeric characters and the underscore (_) are allowed to be entered as CARID information in the CARRCHAR field. The following figure is an example of the table entries.

Sample table CARID datafill

CARRKEY	CARRCHAR
DTC 0 3 CARID	TRUNK_GROUP_A DPRK
DTC 0 3 MISC1	DSX_LOCATION_3 JACK_4
DTC 0 3 MISC2	TROUBLE_REPAIR_800_555_4444
DTC 0 3 MISC4	FC_LOG_122_123

Note: Note that DTC 0 3 MISC3 is intentionally left out to show that it is only displayed with the CARID command if datafilled in table CARID. If no entries exist for a particular PM and carrier, the CARID command only displays the CARID command number entered.

AX0378

MSL: Carrier System ID Log Enhancements (end)

Service orders

MSL: Carrier System ID Log Enhancements does not affect SERVORD.

Operational measurements

MSL: Carrier System ID Log Enhancements does not affect operational measurements.

Logs

The ISDN 105, PM186, PM109, PM110, and PM111 logs will have an extra line appended to the bottom of the log to display the carrier information if datafilled in table CARID for that specific PM and carrier.

User interface

The CARID display and command are added to the CARRIER level on the MAP terminal.

Billing

MSL: Carrier System ID Log Enhancements does not affect billing.

AX0380**MSL: Call Park Enhancement—SYSPARK**

Functionality name

MSL: Call Park Enhancement—SYSPARK

Description

This feature automatically generates the System Park directory number (DN) for the user parking the call when the location of the called party is unknown. In contrast, Directed Call Park must be assigned to a specific key on the set. When this key is activated and the pound sign (#) key is pressed, the caller is parked against a specific SYSPARK DN which is displayed. If the pound sign key is not pressed first and a DN supplied by the user is entered on the keypad, then the normal Directed Call Park feature resumes.

The phone used to pick up the parked call does not need Directed Call Park assigned to it as long as it is in the same customer group as the System Park DN.

Users who currently have Directed Call Park and telephones with a display are automatically upgraded to the SYSPARK feature.

How Call Park works

Call Park is used when the location of a called party is unknown. Calls are parked against a number by a user who then pages the called party to have them retrieve the parked call. When the paged party gets to the telephone, that person dials the call park retrieval code, as well as the address of the parking lot space where the calling party is parked.

There are three types of call park.

- Call Park
- Directed Call Park
- System Park (SYSPARK)

Call Park

Call Park means the call is parked at the DN of the person parking the call. The party parking the call presses the Call Park button and that number is automatically the Call Park DN. To retrieve the call, the called party presses the Call Park button (if there is one on the telephone set), or dials the Call Park access code, on any telephone in the same customer group and dials the DN of the party who parked the call.

AX0380

MSL: Call Park Enhancement—SYSPARK (continued)

Directed Call Park

Directed Call Park means the call is parked at a DN that the person parking the call chooses. The party parking the call presses the Directed Call Park button and then dials a DN in the same customer group. To retrieve the call, the called party presses the Directed Call Park button (if there is one on the telephone set), or dials the Directed Call Park access code, on any telephone in the same customer group. The called party then dials the DN the party who parked the call chose.

System Call Park

System Call Park (SYSPARK) means the call is parked at a DN that the system chooses when the person parking the call presses the Directed Call Park button. There are three ways to retrieve phone calls.

- To retrieve the call from any phone, the called party dials the DN the system chose.
- To retrieve the call from any phone, the called party dials the Call Park retrieval code (for example, *85) and the DN the system chose.
- To retrieve the call from any phone set with the feature Directed Call Park assigned to it, press the Directed Call Park button and the DN the system chose.

Hardware requirements

SYSPARK only works on telephone sets with a configured display.

Limitations and restrictions

The following limitations and restrictions apply to MSL: Call Park Enhancement—SYSPARK:

- Table DNROUTE has a limitation of 50 DNs for System Park. If there are no DNs configured in this table, SYSPARK will not operate.
- SYSPARK supports phone sets with displays (for example, MBS and IVD sets).
- SYSPARK only works on telephone sets with Directed Call Park assigned to them.
- All restrictions or limitations for Directed Call Park apply to SYSPARK (for example, Directed Call Park does not support Attendant Consoles).

AX0380**MSL: Call Park Enhancement—SYSPARK (end)**

Interactions

MSL: Call Park Enhancement—SYSPARK has the same interactions with features as Directed Call Park. Table DNROUTE must be datafilled with System Park DNs before this feature takes effect.

Directed Call Park only allows calls to be parked within the parker's customer group. Likewise, SYSPARK only parks calls within the same customer group. Refer to Datafill for more information.

Datafill

The System Park DNs reside in table DNROUTE. Up to 50 unique DNs can be defined for System Park. Each time System Park is activated, the first available DN in table DNROUTE is used. When there are no DNs datafilled in this table, SYSPARK acts like Directed Call Park.

Each System Park tuple contains the parking slot number and a customer group associated with the SYSPARK DN for the SYSPARK feature selector. When these tuples are datafilled, it is necessary for each DN to be properly assigned to its respective customer group. To prevent calls from being parked without the possibility of being retrieved, datafill each DN so that it can be translated (dialed) from within the customer group to which it is assigned.

Service orders

MSL: Call Park Enhancement—SYSPARK does not affect SERVORD.

Operational measurements

MSL: Call Park Enhancement—SYSPARK does not affect operational measurements.

Logs

MSL: Call Park Enhancement—SYSPARK does not affect logs.

User interface

MSL: Call Park Enhancement—SYSPARK does not change the user interface.

Billing

MSL: Call Park Enhancement—SYSPARK does not affect billing.

AX0382

SNMP Enhancements for MAT & Spectrum

Functionality name

SNMP Enhancements for MAT & Spectrum

Description

This feature enhances the existing DMS management information base (MIB) to monitor and manage the SuperNode remotely. This is achieved by using the industry standard protocol, Simple Network Management Protocol (SNMP).

The existing SNMP framework includes an agent and supporting MIBs which are available in the Telecom layer. The MIB includes standard objects as defined by the MIP-2 ISO standard as well as DMS objects.

The existing DMS MIB objects include the following:

- system description
- node and link status
- logs and alarms
- operational measurements (OM)
- file maintenance
- system restart counts
- security for MAP terminal access
- Internet protocols statistics

This feature adds new MIB objects for network management as well as new functionality to the existing DMS MIB.

The following objects are updated for monitoring and maintenance requests.

- trunk maintenance
- trunk monitoring
- carrier maintenance
- nodes maintenance

Trunk monitoring and trunk maintenance

The trunk MIB monitors all applicable trunk states. The information is obtained by retrieving a valid trunk name and trunk number. Examples of information that can be gathered for trunks include trunk state (the state of the

AX0382**SNMP Enhancements for MAT & Spectrum** (continued)

trunk circuit), trunk name (the name of the trunk CLLI), and trunk direction (the direction of the circuit trunk).

Trunk maintenance is performed on trunks. The maintenance supported includes the following:

- Offline
- BSY
- RTS
- Init

Carrier monitoring and carrier maintenance

The carrier MIB monitors all applicable carrier states. The information is obtained by retrieving a peripheral module (PM) name and PM number. A small subset of information that can be gathered for the carrier includes the following:

- PM name (the name of the peripheral node type)
- PM number (the external node number of the peripheral)
- carrier direction (the direction of the carrier)
- carrier MTC status (the pulse code modulation type of the carrier)

Carrier maintenance is performed on the carrier. The maintenance supported includes the following:

- BSY
- RTS
- Offline
- PM_Reset
- Swact

Nodes monitoring and nodes maintenance

This capability already exists, however, new information is added for maintenance of PMs.

Hardware requirements

SNMP Enhancements for MAT & Spectrum requires an Ethernet Interface Unit (EIU) to run the MAT/MAP evolution software on a PC.

AX0382

SNMP Enhancements for MAT & Spectrum (end)

Limitations and restrictions

The DMS SuperNode must have EIU capabilities, the SNMP software, and a PC running the MAT/MAP evolution software.

Interactions

SNMP Enhancements for MAT & Spectrum has no functionality interactions.

Datafill

SNMP Enhancements for MAT & Spectrum does not affect data schema tables or office parameters.

Service orders

SNMP Enhancements for MAT & Spectrum does not affect SERVORD.

Operational measurements

SNMP Enhancements for MAT & Spectrum does not affect operational measurements.

Logs

SNMP Enhancements for MAT & Spectrum does not affect logs.

User interface

SNMP Enhancements for MAT & Spectrum does not change the user interface.

Billing

SNMP Enhancements for MAT & Spectrum does not affect billing.

AX0383**TL: Carrier System ID Log Enhancements**

Functionality name

TL: Carrier System ID Log Enhancements

Description

This feature adds the Carrier Identification (CARID) command to the MAP CI CARRIER level. This ability displays datafillable administrative information.

This feature creates a table called CARID. The administrative information is retrieved from table CARID and allows a technician to quickly retrieve trunk and trouble reporting information.

This feature also appends the datafillable administrative information to specific digital signal (DS1) carrier logs. A blank line is appended to the carrier logs for all layers of this feature. Only the MSL layer overwrites the blank line with the specific carrier information.

When a carrier system fails or an alarm is generated, or both, the MAP display and log message(s) identify the peripherals affected by the failure. The peripherals that could be affected are listed below.

- digital trunk controller (DTC)
- ISDN digital trunk controller (DTCI)
- line trunk controller (LTC)
- ISDN line trunk controller (LTCI)
- remote cluster controller (RCC)
- ISDN remote cluster controller (RCC2)
- subscriber carrier module access (SMA)
- enhanced SMA (SMA2)

Previously, when a failure occurred, the technician was required to consult paper records, or print edited files stored in a disk, to determine the failing circuit IDs. The ability to append the DS1 carrier circuit ID to the associated carrier system log message reduces the time required to identify failing circuit IDs. By having this information on-line, technicians performing local and remote maintenance can quickly retrieve necessary information to comprehend the problem and obtain trouble reporting numbers.

The following figure is an example of the output the CARID command could produce.

AX0383**TL: Carrier System ID Log Enhancements** (continued)**Sample output of CARID command**

CM	MS	IOD		Net		PM	CCS	Lns		Trks		Ext		APPL
CM Flt	Clock	1	CkEr	Istb		1ESA	.	.	1 CC		1 Maj		.	
M	M					*C*	CR C	*C*		M				
POST	CLASS	ML	OS	ALARM	SYSB	MANB	UNEQ	OFFL	CBSY	PBSY	INSV			
0 Quit_	TRUNKS	0	0	0	0	0	0	87	0	0	84			
2 Post_	REMOTE	0	0	1	2	0	0	0	0	4	20			
3	TIMING	0	0	0	0	0	0	0	0	0	2			
4	DS1													
5 Loop_		N	CLASS	SITE		DTC	CK D	ALRM	SLIP	FRME	BER	ES	SES	STATE
6 Tst_		0	TIMING			0		0C	0	0<1.0	0	0		INSV
7 Bsy_		1	TRUNKS			0		1C	0	1<1.0	3	0		INSV
8 RTS_		2	TIMING			0		2C	0	0<1.0	0	0		INSV
9 OffL_		3	TRUNKS			0		3C	0	2<1.0	4	0		INSV
10 DispOpt_		4	TRUNKS			0		4C	0	1<1.0	3	0		INSV
11 Disp_		SIZE OF POSTED SET: 20						MORE...						
12 Next		CARRIER:												
13		CARID FOR DTC 0 CARRIER 3												
14 Detail_		CARID=TRUNK_GROUP_A_DPRK												
15		MISC1=DSX_LOCATION_3_JACK_4												
16		MISC2=ABC123_TROUBLE_REPAIR_800_555_4444												
17		MISC3=ABC123_DPRK_MN_555_6666												
18 CarID_		MISC4=DPRK_LOG_122_123												
JOEB0B														
Time 14:31 >														
Note: Lines 13 through 18 contain the information taken from the CARID table.														

Accompanying features

This feature works in conjunction with the following features:

- AX0378, MSL: Carrier System ID Log Enhancements
- AX0487, SHR: Carrier System ID Log Enhancements

Hardware requirements

TL: Carrier System ID Log Enhancements has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to TL: Carrier System ID Log Enhancements:

- The datafillable administrative information that is entered in table CARID must be contiguous alphanumeric characters or an underscore. No blanks are allowed. If a blank is entered, it ends the input stream.
- This feature appends a blank line to the ISDN 105, PM109, PM110, PM111, and PM186 logs that are initialized with 64 blank characters. Only the MSL layer overwrites the blank if any entry in the MSL layer

AX0383

TL: Carrier System ID Log Enhancements (continued)

table CARID exists for that specific PM and carrier. All other layers display the blank line.

- The peripheral modules (PM) that can be entered into table CARID include the DTC, DTCL, LTC, LTCL, RCC, RCC2, SMA, and SMA2. Only these peripherals append the table CARID information to the logs. All other peripherals display a blank line.
- The CARID command is available for the MSL layer only.

Interactions

TL: Carrier System ID Log Enhancements has no functionality interactions.

Datafill

Table CARID is created and datafilled with the information pertinent to the local and far end. The key fields are the peripheral, peripheral number, carrier number, and entry. The entry is used as an index into table CARID. Entries of CARID are considered the primary entry and only the primary entry is appended to the logs. The other entries (MISC1, MISC2, MISC3, and MISC4), if datafilled, are available using the CARID command or the table itself. The CARID table is datafilled to contain the exact text that is to be appended to the existing carrier log messages. The text is displayed with the newly created MAP terminal CARID command. (See the previous figure for an example of the CARID command output using the information datafilled in table CARID.) Only ASCII alphanumeric characters and the underscore (_) are allowed to be entered as CARID information in the CARRCHAR field. The following figure is an example of the table entries.

Sample table CARID datafill

CARRKEY				CARRCHAR
DTC	0	3	CARID	TRUNK_GROUP_A_DPRK
DTC	0	3	MISC1	DSX_LOCATION_3_JACK_4
DTC	0	3	MISC2	ABC123_TROUBLE_REPAIR_800_555_4444
DTC	0	3	MISC3	ABC123_DPRK_MN_555_6666
DTC	0	3	MISC4	FC_LOG_122_123

Service orders

TL: Carrier System ID Log Enhancements does not affect SERVORD.

AX0383

TL: Carrier System ID Log Enhancements (end)

Operational measurements

TL: Carrier System ID Log Enhancements does not affect operational measurements.

Logs

The ISDN 105, PM186, PM109, PM110, and PM111 logs have an extra line appended to the bottom of the log to display the carrier information if datafilled in table CARID for that specific PM and carrier. See the following example.

Sample TL layer log

```
MMSLDSNX07AY      *      PM109  AUG06  13:40:29  3933  SYSB  CARRIER  DTCI  0
>
      P-side CARRIER-NO:  3, REASON:  CARRIER LOCAL ALARM SET
>
```

Note: The difference is hard to see. There is an extra blank line before the second prompt (>).

User interface

The CARID display and command are added to the CARRIER level on the MAP terminal and apply to the MSL layer only.

Billing

TL: Carrier System ID Log Enhancements does not affect billing.

AX0384

CCM: Call Waiting Enhancements

Functionality name

CCM: Call Waiting Enhancements

Description

Call Waiting Enhancements lets a user activate and deactivate Call Waiting (CWT) as often and as long as desired. The purpose of this feature is to stop interruption of data calls (for example, fax lines) due to CWT on the line. The user accesses this feature with feature codes.

**The difference between Cancel Call Waiting and Call Waiting Activated
Cancel Call Waiting (CCW)**

When two users with CWT are involved in a data call, CWT on either line disrupts the transmission. The originator of the call has the ability to disable CWT with the Cancel Call Waiting (CCW) access code, but only on a call-by-call basis. Therefore, the originator must use CCW on any new call that he does not want interrupted.

Note: The call can be interrupted by CWT on the terminator end since there is no way of disabling CWT on the terminating side.

Call Waiting Activated (CWTACT)

With this feature, the originator or terminator are no longer interrupted by CWT because call waiting can be disabled for any length of time. Call Waiting Activated gives users the ability to selectively activate or deactivate CWT. With CWTACT, the user can deactivate or activate CWT indefinitely. For both the originator and terminator to not be interrupted during a data call, they would each have to deactivate CWT using CWTACT prior to making the call.

CWTACT is compatible with 500/2500 sets and line class code of integrated business networks (IBN). CWTACT is not compatible with keysets because they are not given a tone when CWT is initiated.

Hardware requirements

CCM: Call Waiting Enhancements has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to CCM: Call Waiting Enhancements:

- CWT must exist on the telephone line.
- CWT cannot be deleted if CWTACT is activated on the line.

AX0384

CCM: Call Waiting Enhancements (continued)

- CWTACT is only assignable to 500/2500 sets.
- CWTACT is not compatible with keysets.
- CWTACT cannot be assigned to Multiline Hunt (MLH) groups because the two features are incompatible.

Interactions

The following paragraphs describe the interactions between CCM: Call Waiting Enhancements and other functionalities.

Call Forward Busy

Call Forward Busy (CFB) presents a call waiting tone to the called party, and a ringing tone to the calling party, if Call Waiting is activated. If Call Waiting has been deactivated (by the user toggling the CWT feature on and off with access codes), CFB forwards the calling party.

Call Forward Don't Answer

Call Forward Don't Answer (CFD) presents a call waiting tone to the called party, and a ringing tone to the calling party, if Call Waiting is activated. If Call Waiting has been deactivated (by the user toggling the CWT feature on and off with access codes), CFD presents busy tone to the calling party.

Call Waiting Origination (CWO)

CWO cannot interrupt a call that has Call Waiting deactivated.

Dial Call Waiting

Dial Call Waiting cannot interrupt a call that has Call Waiting deactivated.

Datafill

Table LCCOPT is modified with an EXT module to allow CWTACT to be datafilled for IBN sets.

Table OPTOPT is modified with an EXT module to make CWTACT incompatible with MLH groups.

Table IBNXLA is modified to use the feature access codes for activating and deactivating CWTACT. The feature names for the access codes follow.

- CWTACT is used to activate the CWTACT option.
- CWTDEACT is used for deactivating the CWTACT option.

AX0384**CCM: Call Waiting Enhancements (end)**

Table IBNFEAT stores the data feature tuple for each line equipment number (LEN) which has the CWTACT option assigned to it.

Service orders

Service orders are modified so the CWTACT feature can be added to an IBN 500/2500 set. An MSL-100 system technician is prompted to enter the status of the CWTACT feature when adding it. Enter Y to have call waiting active and enter N to deactivate call waiting. To assign CWTACT to a line, the line must have CWT configured.

The following commands are used to add CWTACT. The COPYSET command is allowed with this feature.

Service orders commands for CWTACT

```
>ado
SONUMBER:          NOV  97   8  25 PM
>$
DN_OR_LEN:
>8664005
OPTION:
>cwtact
CWT_ACTIVE:
>y
OPTION:
>$
```

Operational measurements

CCM: Call Waiting Enhancements does not affect operational measurements.

Logs

CCM: Call Waiting Enhancements does not affect logs.

User interface

CCM: Call Waiting Enhancements does not change the user interface.

Billing

CCM: Call Waiting Enhancements does not affect billing.

AX0386

CCM: Message Waiting LCD Activation

Functionality name

CCM: Message Waiting LCD Activation

Description

This feature activates an LCD next to the message waiting (MWT) key on M2000 series sets that have both a MWT lamp and an LCD. When a message is in the queue, both the red MWT lamp and the LCD next to the MWT key are activated.

If the user has an autodial key to the message center, the MWT key replaces the autodial key.

Accompanying feature

This feature works in conjunction with feature AX0843, MSL: Message Waiting LCD Activation.

Hardware requirements

CCM: Message Waiting LCD Activation has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to CCM: Message Waiting LCD Activation:

- supports M2000 series sets only
- replaces autodial key to message center
- phones must have both LCD and red MWT lamp

Interactions

CCM: Message Waiting LCD Activation has no functionality interactions.

Datafill

CCM: Message Waiting LCD Activation does not affect data schema tables or office parameters.

Service orders

MWT can be assigned to any blank key on an M2000 series set.

Operational measurements

CCM: Message Waiting LCD Activation does not affect operational measurements.

AX0386

CCM: Message Waiting LCD Activation (end)

Logs

CCM: Message Waiting LCD Activation does not affect logs.

User interface

CCM: Message Waiting LCD Activation does not change the user interface.

Billing

CCM: Message Waiting LCD Activation does not affect billing.

AX0388

CCM: COT & SCF on M2000 Sets

Functionality name

CCM: COT & SCF on M2000 Sets

Description

This feature allows M2000 phone set users to activate the features Selective Call Forwarding (SCF) and Customer Originated Trace (COT). SCF and COT are capabilities within the Custom Local Area Signaling Service (CLASS) feature.

Note: In this feature description, M2000 phone sets refer to M2616, M2008, M2008HF, M2006, M2216 ACD, and M2317 phone sets.

Selective Call Forward

With SCF, M2000 phone set users can ensure that selected calls will reach them when they are away from the home or office. Up to 31 incoming calls can be forwarded to another location. Calls from directory numbers (DN) that are not in the SCF list can be picked up at home or office. They can also receive whatever treatment the user has arranged, such as an answering machine or voice mail. If the SCF destination is busy, the originator receives busy tone.

The following capabilities are supported by SCF:

- the ability to add and delete the SCF feature to all M2000 type sets using SERVORD
- the ability to activate/deactivate the SCF feature using SERVORD
- the ability to activate/deactivate the SCF feature as directed by an announcement
- the interaction with common switch and CLASS tools (such as QLEN, QDN, QDNWRK, COUNT, COUNT ALL, QCM, QSL)
- the ability to provide like-for-like SCF functionality and appearance between the M5000/M8000/M9000 series sets and the M2000 series sets (for example, datafill appropriate tables as those datafilled for M5000/M8000/M9000 series sets)
- the ability to provide interactions with Screening List Editing (SLE) services as those provided by M5000/M8000/M9000 series sets

Customer Originated Trace

COT allows users who have been receiving harassing or prank calls to activate an immediate trace of the last incoming call. This is done without requiring

AX0388**CCM: COT & SCF on M2000 Sets** (continued)

prior approval and costly manual intervention by telephone company personnel. After a harassing or prank call is terminated, the user who wishes to trace the call goes off hook, receives dial tone, and then dials the COT activation code. A log is supplied with information of the originating harassing or prank call.

The following capabilities are supported by COT:

- the ability to add and delete the COT feature to all M2000 series sets using SERVORD
- a LINE 150 log when the COT feature is activated with data concerning the originator of the previous harassing call
- a LINE 151 log when the COT feature is not successfully activated
- a confirmation tone on feature activation to the end user
- appears as an option when using QLEN or QDN and interacts appropriately with QDNWRK and QLENWRK
- CLASS feature tools (such as COUNT, COUNT ALL, and QCM) required to work on M2000 series sets

Hardware requirements

CCM: COT & SCF on M2000 Sets has no additional hardware requirements.

Limitations and restrictions

The following describes the limitations and restrictions for CCM: COT & SCF on M2000 Sets.

SCF is incompatible with the following features and options:

- bridged night number
- customer data change
- denied origination
- denied termination

COT is incompatible with the following features and options:

- automatic line (AUL)
- denied origination
- denied termination
- multiple appearance DN's (MADN)

AX0388

CCM: COT & SCF on M2000 Sets (end)

Interactions

The interactions for this feature are the same as those specified by the SCF and COT features on M5000, M8000, and M9000 series sets. Refer to the DMS features AG1628, CLASS: Selective Call Forwarding, and AG1151, Customer Originated Trace Enhancements, located in ISDN Service Orders for ISDN Terminals Reference Manual and DMS-100 Feature Description Manual, respectively.

Datafill

CCM: COT & SCF on M2000 Sets does not affect data schema tables or office parameters.

Service orders

CCM: COT & SCF on M2000 Sets does not affect SERVORD. Refer to the DMS-100 SERVORD Reference Manual.

Operational measurements

CCM: COT & SCF on M2000 Sets does not affect operational measurements.

Logs

CCM: COT & SCF on M2000 Sets does not affect logs. Refer to the DMS features AG1628, CLASS: Selective Call Forwarding, and AG1151, Customer Originated Trace Enhancements.

User interface

CCM: COT & SCF on M2000 Sets does not change the user interface.

Billing

CCM: COT & SCF on M2000 Sets does not affect billing.

AX0390

CCM: SMDR Per Use Billing for Features

Functionality name

CCM: SMDR Per Use Billing for Features

Description

This feature gives MSL-100 system CLASS service providers the ability to offer billing on a usage basis as opposed to a flat monthly rate. This method is consistent with the way the local telephone company provides billing.

This feature includes four base capabilities.

- usage sensitive SMDR extension record
- SMDR record elements
- activating and deactivating SMDR Per Use Billing extension record
- generation of MSL logs

Usage sensitive SMDR extension record

This feature generates a usage sensitive SMDR extension record (extension code #DF09). This record is based on the same criteria as the per use billing records generated with the bellcore automatic message accounting (AMA) format. This record also stores CLASS feature usage information. The following CLASS features are supported.

- Automatic Call Back (ACB)
- Automatic Recall (AR)
- Calling Number Delivery (CND)
- Calling Name Delivery (CNAMD)
- Dialable Number Delivery (DDN)
- Calling Number Delivery Blocking (CNDB)
- Customer Originated Trace (COT)
- Distinctive Ringing/Call Waiting (DRCW)
- Selective Call Acceptance (SCA)
- Selective Call Forwarding (SCF)
- Selective Call Rejection (SCRJ)
- Deluxe Spontaneous Call Waiting Display (DSCWID)
- Bulk Calling Line Identification (BCLID)

AX0390

CCM: SMDR Per Use Billing for Features (continued)

A sample of the DF09 extension record is shown in the following figure.

```
*REC CODE:DF FMT CODE:09 CLASS FEATURE CODE:0352 BILL DN:2149975250
EVENT YEAR:1998 EVENT MONTH: 01 EVENT DAY:30 EVENT HOUR:15 EVENT
MINUTE:20 EVENT SECOND:25 NUM AVAIL: 0000 NUM UNAVAIL: 0000 NAME
AVAIL: 0000 NAME UNAVAIL: 0000 CONF PEGS: 0000 SCF LIST SIZE: 0005 SCA
LIST SIZE: 0000 SCRJ LIST SIZE: 0000 DRCW LIST SIZE: 0000 SPARE
DATA1: 0000 SPARE DATA2: 0000
```

SMDR record elements

The SMDR Per Use Billing extension record contains the following information:

- a code number indicating the CLASS feature event that occurred. The code numbers are listed in the preceding table, Feature code to feature event mapping.
- the DN to bill against
- the date the record was generated (Year 2000 ready)
- the time the record was generated

Activating and deactivating SMDR Per Use Billing extension record

Activating and deactivating the SMDR Per Use Billing extension record is done through datafill in table CUSTSMDR. The addition of a PERUSE option enables the generation of these SMDR records for the customer group for which the option is datafilled.

Generation of MSL logs

An MSL log is created every time an SMDR Per Use Billing extension record (#DF09) is produced. The log contains calling information such as CLASS feature code, billable DN, and date. Refer to the Logs section of this feature for more information.

Accompanying feature

This feature works in conjunction with feature AX0376, MSL: SMDR Per Use Billing for Features.

Hardware requirements

CCM: SMDR Per Use Billing for Features has no hardware requirements.

AX0390

CCM: SMDR Per Use Billing for Features (end)

Limitations and restrictions

Refer to feature AX0376, MSL: SMDR Per Use Billing for Features for a description of the limitations or restrictions.

Interactions

CCM: SMDR Per Use Billing for Features uses the existing SMDR facilities for generating extension records. No other new interactions are introduced by this feature.

Datafill

Refer to feature AX0376, MSL: SMDR Per Use Billing for Features for details on datafill requirements.

Service orders

CCM: SMDR Per Use Billing for Features does not affect SERVORD.

Operational measurements

CCM: SMDR Per Use Billing for Features does not affect operational measurements.

Logs

Refer to feature AX0376, MSL: SMDR Per Use Billing for Features for details on logs.

User interface

CCM: SMDR Per Use Billing for Features does not change the user interface.

Billing

Refer to feature AX0376, MSL: SMDR Per Use Billing for Features for details on billing.

AX0427

MSL: MSMWI for IBN CLASS Sets

Functionality name

MSL: MSMWI for IBN CLASS Sets

Description

This feature is an enhancement to feature AD8422, Multiple Message Waiting Indication, which allows a secondary telephone set to provide an indication that messages are waiting on the primary telephone set.

Feature AD8422, Multiple Message Waiting Indication, was designed as a key set feature and only supports multiline telephone sets. Feature AD8422 provides visual lamp indication on a key of the secondary telephone set. The enhancements provided by this feature extend the support of Multiple Station Message Waiting Indication (MSMWI) to single line analog integrated business network (IBN) sets which support CLASS messaging. With this enhancement, both primary and secondary sets can be either multiline sets or single line sets. To support the IBN CLASS set and meet this feature's requirements, the MSMWI feature provides a visual indication on a secondary set to notify users of messages waiting on the primary set. The following table lists the IBN sets which support CLASS.

IBN terminals supporting CLASS

Terminal description	Terminal type
	2500
Maestro	15002500350045254625
Powertouch	225250350360
Meridian Business Set	M8001M8003M9216M9316M9417M9516
Quick Touch	100200
Silhouette	

This feature allows Companion C3050 sets to receive a visual indication of messages waiting on the primary set. The Companion C3050 sets are considered by the MSL-100 system to be single line analog IBN sets.

Accompanying feature

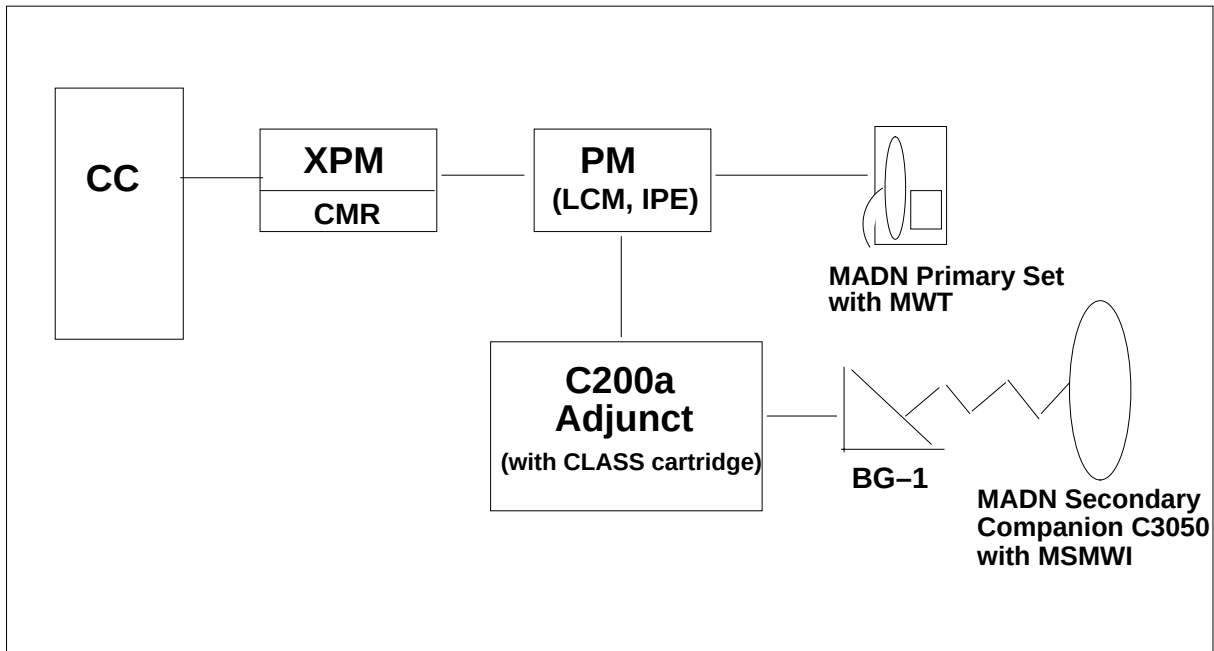
This feature works in conjunction with feature AX0428, CCM: MSMWI for IBN CLASS Sets.

AX0427**MSL: MSMWI for IBN CLASS Sets** (continued)**Hardware requirements**

CCM: MSMWI for IBN CLASS Sets requires that the XPM have a CLASS modem resource (CMR) card because this feature only operates on IBN sets that are capable of CLASS messaging. Refer to feature AX0427, MSL: MSMWI for IBN CLASS Sets, for more information on hardware requirements.

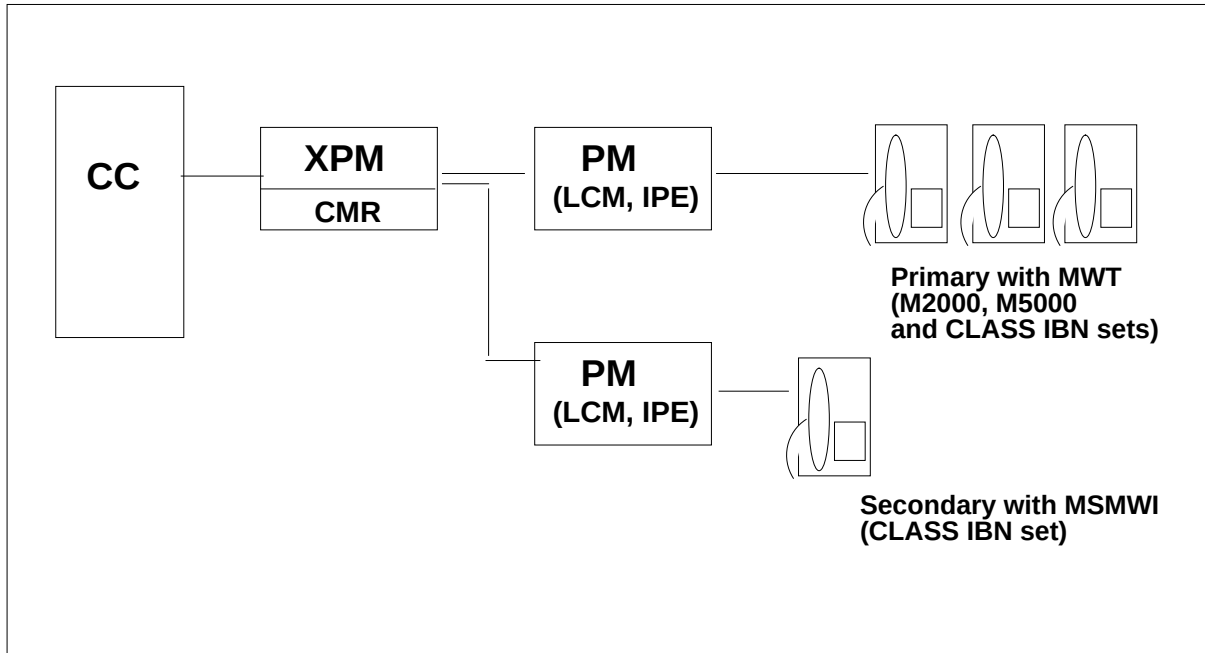
The XPMs which support the CMR card are listed below.

- line group controller (LGC)
- line trunk controller (LTC)
- subscriber module access (SMA)
- subscriber carrier module access 2 (SMA2)
- remote cluster controller (RCC)
- remote cluster controller 2 (RCC2)



AX0427

MSL: MSMWI for IBN CLASS Sets (continued)



Limitations and restrictions

The following limitations and restrictions apply to MSL: MSMWI for IBN CLASS Sets:

- The IBN sets supported are IBN CLASS sets. These sets must meet the hardware requirements in the preceding description.
- The number of primaries that a secondary can be provisioned to monitor is limited to one for single line sets. This limitation is because the MSMWI feature can only be assigned once to an IBN set.
- The MSMWI feature is not assignable to a secondary directory number (SDN) (using Teen Services) of an IBN set.
- The IBN set requires a message waiting lamp in order for the user to receive the secondary indication. However, this feature can be configured by datafilling an IBN set which does not have a lamp. Because there is no lamp, the user of the IBN set will not receive any indication of a message waiting on the set.

Interactions

This feature requires that the primary set be datafilled with the Message Waiting (MWT) or Executive Message Waiting (EMW) feature and that the secondary set be datafilled with the MSMWI feature.

AX0427

MSL: MSMWI for IBN CLASS Sets (continued)

This feature is transparent to MADN single call arrangement (SCA) groups. The feature operates the same regardless of whether the primary and secondaries are or are not members of a MADN SCA group.

Datafill

This feature affects four tables:

- IBNFEAT
- MSMWI
- LCCOPT
- OPTOPT

The format and information contained within the tuples of tables IBNFEAT and MSMWI does not change. The MSMWI table is capable of containing LENs of IBN sets as well as key sets. The only difference is the key value displayed. The logical key for LENs of IBN sets is zero. The following examples display how the datafill looks in tables IBNFEAT and MSMWI when the MSMWI data feature is assigned to an IBN set.

Table IBNFEAT

LEN	DNNO	DF	FEATURE	DATA
LCM1	00	0	08	00 0 MSMWI MSMWI LCM1 00 1 09 31 5

Table MSMWI

MSMWIKEY	SLEN	SLKEY
LCM1 00 1 09 31 5 1	LCM1 00 0 09 00	0

AX0427

MSL: MSMWI for IBN CLASS Sets (continued)

Table LCCOPT

This table needs to be datafilled so that MSMWI can be assigned to IBN sets. In this table, the MSMWI feature is added to the IBN line class code (LCC) tuple.

Table OPTOPT

This table needs to be datafilled so that MSMWI can be assigned to SDN. In this table, the MSMWI feature is added to the SDN option tuple.

Service orders

When adding the MSMWI option to an IBN set, the user is not prompted for the primary's logical key. A default value of zero is used by the system.

Prompt Mode:

```
>ado
SONUMBER:          NOW 76  1  1  PM
>$
DN_OR_LEN:
>8653008
OPTION:
>msmwi
PRIMARY_LEN:
>lcm1  0  1  9  31
OPTION:
>$
COMMAND AS ENTERED:
ADO NOW 76 1 1 PM 8653008 ( MSMWI LCM1 00  1  09  31 ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
>y
MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED
JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED
SHOULD ORDER BE DONE ANYWAY? (Y OR N)
> y
```

No-prompt Mode:

```
>ADO $ 8653008 MSMWI LCM1 00  1  09  31 $ Y Y
```


AX0427

MSL: MSMWI for IBN CLASS Sets (end)

Operational measurements

MSL: MSMWI for IBN CLASS Sets does not affect operational measurements.

Logs

MSL: MSMWI for IBN CLASS Sets does not affect logs.

User interface

MSL: MSMWI for IBN CLASS Sets does not change the user interface.

Billing

MSL: MSMWI for IBN CLASS Sets does not affect billing.

AX0428

CCM: MSMWI for IBN CLASS Sets

Functionality name

CCM: MSMWI for IBN CLASS Sets

Description

This feature is an enhancement to feature AD8422, Multiple Message Waiting Indication, which allows a secondary telephone set to provide an indication that messages are waiting on the primary telephone set.

Feature AD8422, Multiple Message Waiting Indication, is a key set feature and only supports multiline telephone sets. Feature AD8422 provides visual lamp indication on a key of the secondary telephone set. The enhancements provided by this feature extend the support of Multiple Station Message Waiting Indication (MSMWI) to single line analog integrated business network (IBN) sets which support CLASS messaging. With this enhancement, both primary and secondary telephone sets can be either multiline sets or single line sets. To support the IBN CLASS terminal and meet this feature's requirements, the MSMWI feature provides visual indication on a secondary telephone set.

This feature allows Companion C3050 sets to receive a visual indication of messages waiting on the primary telephone set. The Companion C3050 sets are considered by the MSL-100 system to be single line analog IBN sets.

How this feature affects the CCM layer

Two functional areas within the CCM layer are affected by this feature. The areas are provisioning and set indication manipulation. To isolate the MSMWI functionality to the MSL-100 system, procedure variables are defined in these functional areas to allow the functionality of this feature to reside only in the MSL layer.

Provisioning

Provisioning within the CCM layer involves the following functionality:

- allows table IBNFEAT to be datafilled with the MSMWI data feature
- allows updating of the read-only MSMWI table when table IBNFEAT is datafilled with the MSMWI data feature
- ability to assign the MSMWI data feature to an IBN CLASS set using SERVORD
- allows verification that secondary sets are not assigned to a primary IBN set when Message Waiting (MWT) and Executive Message Waiting (EMW) is being deleted from the primary set

AX0428**CCM: MSMWI for IBN CLASS Sets** (continued)**Set Indication Manipulation**

Set indication manipulation within the CCM layer involves the following functionality:

- allows sending of CLASS messaging to secondary sets which provide the indication of messages waiting on the primary set
- allows auditing of the indication status of the secondary IBN set

Accompanying feature

This feature works in conjunction with feature AX0427, MSL: MSMWI for IBN CLASS Sets.

Hardware requirements

CCM: MSMWI for IBN CLASS Sets requires that the XPM have a CLASS Modem Resource (CMR) card because this feature only operates on IBN sets that are capable of CLASS messaging. Refer to feature AX0427, MSL: MSMWI for IBN CLASS Sets, for more information on hardware requirements.

The XPMs which support the CMR card follow.

- line group controller (LGC)
- line trunk controller (LTC)
- subscriber module access (SMA)
- subscriber carrier module access 2 (SMA2)
- remote cluster controller (RCC)
- remote cluster controller 2 (RCC2)

Limitations and restrictions

The following limitations and restrictions apply to CCM: MSMWI for IBN CLASS Sets:

- The IBN sets supported are IBN CLASS sets. These sets must meet the hardware requirements in the preceding description.
- The number of primaries that a secondary can be provisioned to monitor is limited to one for single line sets. This limitation is because the MSMWI feature can only be assigned once to an IBN set.

AX0428

CCM: MSMWI for IBN CLASS Sets (end)

- The MSMWI feature is not assignable to a secondary directory number (SDN) (using Teen Services) of an IBN set.
- The IBN set requires a message waiting lamp in order for the user to receive the secondary indication. However, this feature can be configured by datafilling an IBN set which does not have a lamp. Because there is no lamp, the user of the IBN set will not receive any indication of a message waiting on the set.

Interactions

This feature requires that the primary set be datafilled with the MWT or EMW feature and that the secondary set be datafilled with the MSMWI feature.

This feature is transparent to MADN single call arrangement (SCA) groups. The feature operates the same regardless of whether the primary and secondaries are or are not members of a MADN SCA group.

Datafill

Refer to feature AX0427, MSL: MSMWI for IBN CLASS Sets, for information on datafill requirements.

Service orders

Refer to feature AX0427, MSL: MSMWI for IBN CLASS Sets, for information on service orders requirements.

Operational measurements

CCM: MSMWI for IBN CLASS Sets does not affect operational measurements.

Logs

CCM: MSMWI for IBN CLASS Sets does not affect logs.

User interface

CCM: MSMWI for IBN CLASS Sets does not change the user interface.

Billing

CCM: MSMWI for IBN CLASS Sets does not affect billing.

AX0487**SHR: Carrier System ID Log Enhancements**

Functionality name

SHR: Carrier System ID Log Enhancements

Description

This feature adds the Carrier Identification (CARID) command to the MAP CI CARRIER level. This ability displays datafillable administrative information.

This feature creates a table called CARID. The administrative information is retrieved from table CARID and allows a technician to quickly retrieve trunk and trouble reporting information.

This feature also appends the datafillable administrative information to specific digital signal (DS1) carrier logs. A blank line is appended to the carrier logs for all layers of this feature. Only the MSI layer overwrites the blank line with specific carrier information. Refer to the logs description in this section.

When a carrier system fails or an alarm is generated, or both, the MAP display and log message(s) identify the peripherals affected by the failure. The peripherals that could be affected are

- digital trunk controller (DTC)
- ISDN digital trunk controller (DTCI)
- line trunk controller (LTC)
- ISDN line trunk controller (LTCI)
- remote cluster controller (RCC)
- ISDN remote cluster controller (RCC2)
- subscriber carrier module access (SMA)
- enhanced SMA (SMA2)

Previously, when a failure occurred, the technician was required to consult paper records or print edited files stored in a disk, to determine the failing circuit IDs. The ability to append the DS1 carrier circuit ID to the associated carrier system log message reduces the time required to identify failing circuit IDs. By having this information on-line, technicians performing local and remote maintenance can quickly retrieve necessary information to comprehend the problem and obtain trouble reporting numbers.

AX0487

SHR: Carrier System ID Log Enhancements (continued)

Accompanying features

This feature works in conjunction with the following features:

- AX0378, MSL: Carrier System ID Log Enhancements
- AX0383, TL: Carrier System ID Log Enhancements

Hardware requirements

SHR: Carrier System ID Log Enhancements has no hardware requirements.

Limitations and restrictions

SHR: Carrier System ID Log Enhancements has no limitations or restrictions.

Interactions

SHR: Carrier System ID Log Enhancements has no functionality interactions.

Datafill

SHR: Carrier System ID Log Enhancements does not affect data schema tables or office parameters.

Service orders

SHR: Carrier System ID Log Enhancements does not affect SERVORD.

Operational measurements

SHR: Carrier System ID Log Enhancements does not affect operational measurements.

Logs

The ISDN 105 carrier log is modified to contain an extra line for all layers. For example, the following table shows how ISDN 105 currently looks.

```
MMSLDSNX07AY * ISDN105 AUG06 11:08:37 8852 FLT PRA Sync Loss
>
      ISP = 0          DTCTI    0          PORT 1 CHNL 22
>
```

The ISDN 105 log is modified to look like the following in all layers except the MSL layer.

AX0487**SHR: Carrier System ID Log Enhancements (end)**

```
MMSLDSNX07AY * ISDN105 AUG06 11:08:37 8852 FLT PRA Sync Loss
>
      ISP = 0          DTCI    0          PORT 1 CHNL 22

>
```

Note: The difference is hard to see. There is an extra blank line before the second prompt (>).

User interface

SHR: Carrier System ID Log Enhancements does not change the user interface.

Billing

SHR: Carrier System ID Log Enhancements does not affect billing.

AX0687

MSL: Call Waiting Enhancements

Functionality name

MSL: Call Waiting Enhancements

Description

Call Waiting Enhancements lets a user activate and deactivate Call Waiting (CWT) as often and as long as desired. The purpose of this feature is to stop interruption of data calls (for example, fax lines) due to CWT on the line. The user accesses this feature with feature codes. The MSL-100 system administrator assigns the feature access code in table IBNXLA.

The difference between Cancel Call Waiting and Call Waiting Activated Cancel Call Waiting (CCW)

When two users with CWT are involved in a data call, CWT on either line disrupts the transmission. The originator of the call has the ability to disable CWT with the Cancel Call Waiting (CCW) access code, but only on a call-by-call basis. Therefore, the originator must use CCW on any new call that he does not want interrupted.

Call Waiting Activated (CWTACT)

With this feature, the originator will no longer be interrupted by CWT because call waiting can be disabled for any length of time. Call Waiting Activated gives users the ability to selectively activate or deactivate CWT. With CWTACT, the user can deactivate or activate CWT indefinitely.

Note: The call can be interrupted by CWT on the terminator end since there is no way of disabling CWT on the terminating side.

CWTACT is compatible with 500/2500 sets and line class code of integrated business networks (IBN). CWTACT is not compatible with keysets because they are not given a tone when CWT is initiated.

Accompanying feature

This feature works in conjunction with feature AX0384, CCM: Call Waiting Enhancements.

Hardware requirements

MSL: Call Waiting Enhancements has no hardware requirements.

AX0687**MSL: Call Waiting Enhancements** (continued)

Limitations and restrictions

The following limitations and restrictions apply to MSL: Call Waiting Enhancements:

- CWT must exist on the originating MSL-100 telephone line.
- CWT cannot be deleted if CWTACT is activated on the line.
- CWTACT is only assignable to 500/2500 sets.
- CWTACT is not compatible with keysets.
- CWTACT cannot be assigned to Multiline Hunt (MLH) groups because the two features are incompatible.

Interactions

The following paragraphs describe the interactions between MSL: Call Waiting Enhancements and other functionalities.

Call Forward Busy

Call Forward Busy (CFB) presents a call waiting tone to the called party, and a ringing tone to the calling party, if Call Waiting is activated. If Call Waiting has been deactivated (by the user toggling the CWT feature on and off with access codes), CFB forwards the calling party.

Call Forward Don't Answer

Call Forward Don't Answer (CFD) presents a call waiting tone to the called party, and a ringing tone to the calling party, if Call Waiting is activated. If Call Waiting has been deactivated (by the user toggling the CWT feature on and off with access codes), CFD presents busy tone to the calling party.

Call Waiting Origination (CWO)

CWO cannot interrupt a call that has Call Waiting deactivated.

Dial Call Waiting

Dial Call Waiting cannot interrupt a call that has Call Waiting deactivated.

Datafill

Table LCCOPT is modified by the use of an EXT file so that feature CWTACT can be datafilled for IBN sets.

AX0687

MSL: Call Waiting Enhancements (end)

Table IBNXLA is modified to use the feature access codes for activating and deactivating CWTACT. The following are feature names for the access codes.

- CWTACT is used to activate the CWTACT feature.
- CWTDEACT is used to deactivate the CWTACT feature.

Service orders

Service orders are modified so the CWTACT feature can be added to an IBN 500/2500 set. An MSL-100 system technician is prompted to enter the status of the CWTACT feature when adding it. Enter Y to have call waiting active and enter N to deactivate call waiting. To assign CWTACT to a line, the line must have CWT configured.

The following commands are used to add CWTACT. The COPYSET command is allowed with this feature.

Service orders commands for CWTACT

```
>ado
SONUMBER:          NOV  97   8  25 PM
>$
DN_OR_LEN:
>8664005
OPTION:
>cwtact
CWT_ACTIVE:
>y
OPTION:
>$
```

Operational measurements

The IBN Call Waiting Fail OM will be pegged for IBN lines with CWT and CWTACT when CWTACT is deactivated.

Logs

MSL: Call Waiting Enhancements does not affect logs.

User interface

MSL: Call Waiting Enhancements does not change the user interface.

Billing

MSL: Call Waiting Enhancements does not affect billing.

AX0843

MSL: Message Waiting LCD Activation

Functionality name

MSL: Message Waiting LCD Activation

Description

This feature allows MWT to be assigned to any blank key on M2000 series sets. When a message is in the queue, both the red MWT lamp and the LCD next to the MWT key are activated.

If the user has an autodial key to the message center, the MWT key replaces the autodial key.

Accompanying feature

This feature works in conjunction with feature AX0386, CCM: Message Waiting LCD Activation.

Hardware requirements

MSL: Message Waiting LCD Activation has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to MSL: Message Waiting LCD Activation:

- supports M2000 series sets only
- replaces autodial key to message center
- phones must have both LCD and red MWT lamp

Interactions

MSL: Message Waiting LCD Activation has no functionality interactions.

Datafill

MSL: Message Waiting LCD Activation does not affect data schema tables or office parameters.

Service orders

See feature, AX0386, CCM: Message Waiting LCD Activation, for more information.

Operational measurements

MSL: Message Waiting LCD Activation does not affect operational measurements.

AX0843

MSL: Message Waiting LCD Activation (end)

Logs

MSL: Message Waiting LCD Activation does not affect logs.

User interface

MSL: Message Waiting LCD Activation does not change the user interface.

Billing

MSL: Message Waiting LCD Activation does not affect billing.

AX0912**CNA: NI-2 User Access Development**

Functionality name

CNA: NI-2 User Access Development

Description

National ISDN-2 (NI-2) is a set of standards for ISDN in North America. These standards provide uniform messaging, functions, and features that promote interoperability among systems provided by different equipment vendors. These standards are documented in Bellcore publications. Before NI-2, there was a wide variety of semi-proprietary implementations of ISDN. The Nortel North America (NTNA) ISDN variant was one such implementation. As makers and users of communications equipment employing ISDN primary rate interfaces (PRI) migrate towards NI-2 compliance, it becomes necessary for Nortel to bring its implementation of ISDN PRI into compliance with NI-2. This compliance satisfies Nortel's customer's needs for interoperable equipment.

Nortel has already developed NI-2 software for ISDN PRI in the DMS-100 environment. This software brought the DMS-100 into compliance with NI-2 specifications for the network side of the PRI user network interface. Feature AX0912 implements the computing module (CM) resident portion of NI-2 compliant functionality, providing user side support for the PRI user network interface.

This feature addresses several requirements which are specific to the user side of the PRI user network interface. There are two general categories of functionality involved with this support.

- **Basic call:** This enables provisioning of an NIPRI trunk as user side. It sets default values for certain protocol timers on the user side. Basic call allows the type of number (TON) and numbering plan identifier (NPI) fields of the called party number (CPN) information element of the SETUP message to be set to UNKNOWN/UNKNOWN for calls outgoing from the user side.
- **Call-by-call (CBC):** This provides user provisioning of carrier identification information for certain types of outgoing CBC services. It sets the length of network identification, type of network identification, network identification plan, and network identification fields of the network-specific facilities (NSF) information element of the SETUP message for outgoing CBC services.

AX0912

CNA: NI-2 User Access Development (continued)

Accompanying feature

This feature works in conjunction with feature AX0940, XPM: NI-2 User Access Development.

Recommended reference material

The following documentation should be referenced for additional information on NI-2 ISDN PRI.

- ISDN Primary Rate Interface Call Control Switching and Signaling Generic Requirements for Class II Equipment, Issue 1, December 1991, plus Revision 1, December 1992, plus Revision 2, December 1994, Bellcore. Document number TR-NWT-001268.
- Generic Requirements for ISDN PRI Call-By-Call Service Selection for Non-ISDN Foreign Exchange Facilities, Non-ISDN Tie Trunks, OUTWATS, and INWATS, Issue 1, May 1992, plus Bulletin 1, December 1993, plus Bulletin 2, January 1995, Bellcore. Document number TR-NWT-001270.
- 1997 Version of National ISDN Primary Rate Interface Customer Premises Equipment Generic Guidelines, Issue 1, November 1996, plus Revision 1, June 1997, Bellcore. Document number SR-3887.
- Meridian SL-100 ISDN Primary Rate Interface Reference Manual. Document number 555-4001-106.
- Feature AJ4141, Legacy NI-2 ISDN PRI Variant, Nortel.
- Feature AJ4144, NI-2 PRI Basic Call, Nortel.
- Feature AF6864, PRI Call-by-Call, Nortel.

Hardware requirements

CNA: NI-2 User Access Development has no hardware requirements.

Limitations and restrictions

For all calls initiated over the user side of the NI-2 PRI trunks, the TON and NPI will be set to UNKNOWN.

Interactions

CNA: NI-2 User Access Development depends upon modifications made to feature AX0940, XPM: NI-2 User Access Development.

AX0912

CNA: NI-2 User Access Development (continued)

Datafill

This feature requires datafill for the following tables:

- table LTDEF
- table PRIPROF
- table LTMAP

Table LTDEF

To provision a PRI trunk as NI-2, there must be an entry in table LTDEF containing a logical terminal definition specifically for NI-2. That logical terminal must be datafilled in an LTID option in the GRPINFO field of table TRKGRP.

The following shows the datafill necessary for defining an NI-2 logical terminal in table LTDEF.

Field	Subfield	Value
-----	-----	-----
CLASSREF	LTCLASS	PRA
CLASSREF	VARIANT	NIPPRI
CLASSREF	ISSUE	NI2V1
CLASSREF	PROFNAME	(see note)

An optional profile name of a profile defined in table PRIPROF which contains NI-2 specific profile information can be included.

AX0912**CNA: NI-2 User Access Development** (continued)

The following is an example of a logical terminal (LTID 15) which has been datafilled for use as NI-2 PRI.

LTKEY LTAP CLASSREF

ISDN 15 B PRA 25 25 4 4 NIPRI NI2V1 NIL (NOPMD) \$

Table PRIPROF

This table is used for specifying various modifications to the base protocol. For ISDN PRI versions prior to NI-2 (for example, NTNA), this table was used to specify protocol variations used in communicating with equipment from manufacturers other than Nortel. This table also specified selected (using switches) behaviors of these protocol variations.

Because the intent of NI-2 is to provide a uniform protocol which does not allow variations, most of the functions performed by this table are not used on NI-2 trunks. For the NI-2 variant, the only supported switch is UNTONNPI, which forces the type of number/numbering plan identifier field of outgoing PRI calls to the value "unknown/unknown." This value is required in some cases to make destination switches correctly translate and route calls.

To make this profile work, the profile name must be placed into the PROFNAME field of an NI-2 logical terminal entry in table LTDEF.

The following shows how to provision table PRIPROF for NI-2.

AX0912

CNA: NI-2 User Access Development (continued)

Field	Subfield	Value
-----	-----	-----
PROFNAME	-	user-defined name
VARINFO	VARIANT	NIPRI
VARINFO	ISSUE	NI2V1
SWITCH	-	UNTONNPI

The following is an example of an entry with a PROFNAME of NI2PROFL which is datafilled for NI-2.

```
PROFNAME  VARINFO  SWITCH
-----
NI2PROFL  NIPRI    NI2V1  (UNTONNPI) $
```

Table LTMAP

Table LTMAP is modified to allow mapping for an NIPRI trunk that has user side specified in table TRKSGRP.

The following is an example of an NI2 PRI user side trunk, called RCHTORTPNI2, in table TRKSGRP.

```
ISDN 13 CLLI RCHTORTPNI2 TEI 0 $
```

Tables LTDATA and LTCALLS

There is no new datafill for these tables specific to the user side (MSL-100) of NI-2. However, there may be changes specific to the network side (DMS-100) of NI-2. Refer to the specific DMS-100 documentation for details.

For more details on data schema changes for this feature, refer to the MSL-100 data schema documentation.

AX0912

CNA: NI-2 User Access Development (end)

Service orders

CNA: NI-2 User Access Development does not affect SERVORD.

Operational measurements

CNA: NI-2 User Access Development does not affect operational measurements.

Logs

CNA: NI-2 User Access Development does not affect logs.

User interface

CNA: NI-2 User Access Development does not change the user interface.

Billing

CNA: NI-2 User Access Development does not affect billing.

AX0913
CCM: Flexible LEN

Functionality name

CCM: Flexible LEN

Description

Without this feature, datafill for the intelligent peripheral equipment (IPE) is restricted to voice only on even line equipment numbers (LEN) and data only on odd LENs. This feature allows datafill for the IPE with voice class of service on odd LENs and data class of service on even LENs.

This feature is used to access the Symposium Personal Computer (PC) Communicator card.

The following modifications were made to the CCM layer to support Flexible LEN.

- Defines the FLXA card type in the CARDINFO field of table LNINV. (See note.)
- Provides table control support for new cardinfo types.
- Removes the odd/even LEN restriction in Servord for the NEW, EST, CKLN, and ADD commands (if LEN is assigned FLXA).
- Modifies Servord error messages so it does not specify particular PEC codes.
- Defines the DTMK option for the Communicator card. (See note.)

Note: These modifications are made in this feature and feature AX0947, MSL: Flexible LEN.

Accompanying features

The following features work in conjunction with this feature:

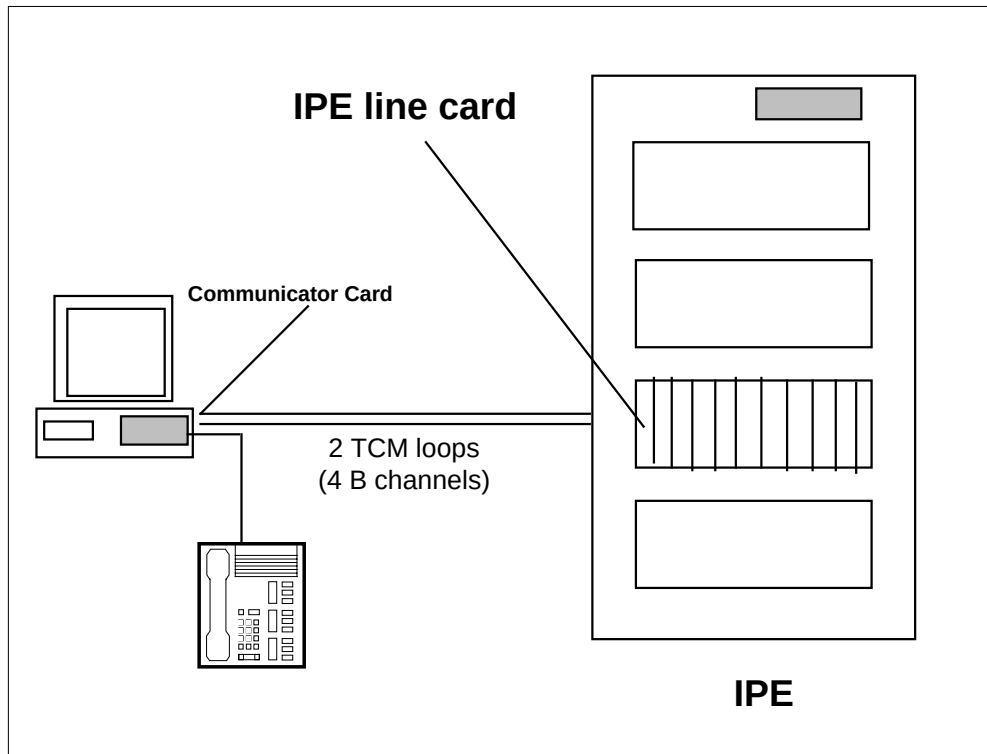
- AX0942, XPM: Flexible LEN
- AX0947, MSL: Flexible LEN

Symposium PC Communicator card

The Communicator card is installed inside a PC and interfaces with an IPE digital line card and a Meridian digital telephone set. The Communicator card supports the use of computer telephony interface (CTI) applications. This card allows voice or data class of service on either B-channels of the time compression multiplexed (TCM) loop from the PC to the IPE. Because this feature allows users to access both channels (voice and data), the use of two digital ports is extended to 256 Kbytes of data. See the following figure.

AX0913

CCM: Flexible LEN (continued)



This feature also defines a data mode key (DTMK) option that can be assigned to one secondary DN of an integrated voice and data (IVD) set connected to a Communicator card. The data mode key allows data communication on a secondary DN of a set while still supporting voice on the primary DN of the same set.

Hardware requirements

For sites wanting to use CTI applications such as Symposium, the Communicator card is required.

Limitations and restrictions

CCM: Flexible LEN has no limitations or restrictions.

Interactions

CCM: Flexible LEN has no interactions.

Datafill

CCM: Flexible LEN has no new datafill.

AX0913
CCM: Flexible LEN (end)

Service orders

See feature AX0947, MSL: Flexible LEN, for servord information on the DTMK option.

Operational measurements

CCM: Flexible LEN does not affect operational measurements.

Logs

CCM: Flexible LEN does not affect logs.

User interface

CCM: Flexible LEN does not change the user interface.

Billing

CCM: Flexible LEN does not affect billing.

AX0914

CCM: Call Forward Time of Day

Functionality name

CCM: Call Forward Time of Day

Description

Call Forward Time of Day (CFTOD) forwards calls based on the day of the week or year, or the time of day. Before this feature, users could forward all calls to a specific directory number (DN) using the Call Forward Universal (CFU) feature, or they could forward all calls to a specific internal DN (within the same customer group) using the Call Forward Intragroup (CFI) feature.

This feature supports Meridian business sets (MBS), integrated voice and data (IVD) sets, Integrated Services Digital Network (ISDN) sets, and integrated business network (IBN) sets. The sets are required to have CFU or CFI assigned to them before CFTOD can be assigned.

CFTOD is added to key 1 for keysets and is set to active in service orders (SERVORD).

CFTOD allows separate forwarding DNs for internal, external, and data calls by allowing each phone to be given three TODNAMES at the SERVORD prompt. These TODNAMES have their own forwarding scheme defined in table TIMEODAY. CFTOD information is displayed using the CI commands QLEN, QDN, and QLT.

Accompanying feature

This feature works in conjunction with feature AX0946, MSL: Call Forward Time of Day.

Setting up CFTOD

Refer to feature AX0946, MSL: Call Forward Time of Day for details on datafilling tables for CFTOD.

Hardware requirements

CCM: Call Forward Time of Day has no hardware requirements.

Limitations and restrictions

Refer to feature AX0946, MSL: Call Forward Time of Day for details on limitations and restrictions.

AX0914

CCM: Call Forward Time of Day (end)

Interactions

Refer to feature AX0946, MSL: Call Forward Time of Day for details on interactions.

Datafill

Table LCCOPT is modified by the use of an EXT file to allow the line option CFTOD to be datafilled for MBS, IVD, IBN, and ISDN sets.

Service orders

Adding, deleting, or changing CFTOD TODNAMES for a DN is done with SERVORD. Refer to feature AX0946, MSL: Call Forward Time of Day for SERVORD examples.

Operational measurements

CCM: Call Forward Time of Day does not affect operational measurements.

Logs

CCM: Call Forward Time of Day does not affect logs.

User interface

CCM: Call Forward Time of Day does not change the user interface.

Billing

CCM: Call Forward Time of Day does not affect billing.

AX0923

CCM: SOC for LINE 117 and LINE 125 Enhancements

Functionality name

CCM: SOC for LINE 117 and LINE 125 Enhancements

Description

Feature AD9699, LINE 117/125 Log Enhancements, provides identification information of the calling party. This feature provides a software optionality control (SOC) option that controls the availability of calling party information in LINE 117 and LINE 125 logs.

Refer to feature AD9699 for more information on LINE 117 and LINE 125 log enhancements.

SOC information

Option name	Order code
BAS CLID Linelog Enh	BAS00072

This feature does not change the format of LINE 117 and LINE 125 logs. The calling number and source fields added to the logs is present regardless of whether the SOC is idle or on.

Calling party information is only provided in the calling number and source fields if both of the following conditions exist.

- the SOC is set to on
- the calling party information is available

Hardware requirements

CCM: SOC for LINE 117 and LINE 125 Enhancements has no hardware requirements.

Limitations and restrictions

CCM: SOC for LINE 117 and LINE 125 Enhancements is only available for the MSL-100 market.

Interactions

CCM: SOC for LINE 117 and LINE 125 Enhancements has no functionality interactions.

AX0923

CCM: SOC for LINE 117 and LINE 125 Enhancements (continued)

Datafill

CCM: SOC for LINE 117 and LINE 125 Enhancements does not affect data schema tables or office parameters.

Service orders

CCM: SOC for LINE 117 and LINE 125 Enhancements does not affect SERVORD.

Operational measurements

CCM: SOC for LINE 117 and LINE 125 Enhancements does not affect operational measurements.

Logs

No logs are physically changed by this feature. If the SOC state is idle, then no calling party information is present in the LINE 117 and LINE 125 logs. See the following figure for an example of the logs with the SOC state set to idle.

AX0923**CCM: SOC for LINE 117 and LINE 125 Enhancements** (continued)**Sample LINE117 and LINE125 logs with SOC state idle**

```

LINELOGS      *LINE117 OCT29 11:10:39 5800 INFO CALLING LINE IDENT
              LEN LCM1 00 1 09 31 DN 9975056 KEY 1
              INCOMING TRUNK = CKT RCHTORTPSS7 0
              CALLID = 360467
              TIME: OCT29 11:10:39
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE
LINELOGS      *LINE125 OCT29 11:11:37 8000 INFO TRACE_ON_MALICIOUS_CALL_INITIATED
              LEN RLCM 00 0 10 00 DN 9975002
              INCOMING TRUNK = CKT RCHTORTPSS7 1
              CALLID = 360459
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE
LINELOGS      *LINE117 OCT29 11:12:41 5800 INFO CALLING LINE IDENT
              LEN LCM1 00 1 09 31 DN 9975056 KEY 1
              INCOMING TRUNK = CKT RCHTORTPPRI 0
              CALLID = 360522
              TIME: OCT29 11:12:41
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE
LINELOGS      *LINE125 OCT29 11:13:52 8000 INFO TRACE_ON_MALICIOUS_CALL_INITIATED
              LEN RLCM 00 0 10 00 DN 9975002
              INCOMING TRUNK = CKT RCHTORTPPRI 1
              CALLID = 360344
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE
LINELOGS      *LINE117 OCT29 11:15:07 5800 INFO CALLING LINE IDENT
              LEN LCM1 00 1 09 31 DN 9975056 KEY 1
              INCOMING TRUNK = CKT RCHTORTPPTS 0
              CALLID = 360456
              TIME: OCT29 11:15:07
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE
LINELOGS      *LINE125 OCT29 11:16:48 8000 INFO TRACE_ON_MALICIOUS_CALL_INITIATED
              LEN RLCM 00 0 10 00 DN 9975002
              INCOMING TRUNK = CKT RCHTORTPPTS 1
              CALLID = 360613
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE

```

If the SOC state is on, then calling party information is present in the LINE 117 and LINE 125 logs (if available). See the following figure for an example of the logs with the SOC state set to on.

AX0923**CCM: SOC for LINE 117 and LINE 125 Enhancements (end)****Sample LINE117 and LINE125 logs with SOC state on**

```

LINELOGS      *LINE117 OCT29 11:10:39 5800 INFO CALLING LINE IDENT
              LEN LCM1 00 1 09 31 DN 9975056 KEY 1
              INCOMING TRUNK = CKT RCHTORTPSS7 0
              CALLID = 360467
              TIME: OCT29 11:10:39
              CALLING NUMBER = 2149975015
              SOURCE = CALLING NUMBER
LINELOGS      *LINE125 OCT29 11:11:37 8000 INFO TRACE_ON_MALICIOUS_CALL_INITIATED
              LEN RLCM 00 0 10 00 DN 9975002
              INCOMING TRUNK = CKT RCHTORTPSS7 1
              CALLID = 360459
              CALLING NUMBER = 2149975015
              SOURCE = CALLING NUMBER
LINELOGS      *LINE117 OCT29 11:12:41 5800 INFO CALLING LINE IDENT
              LEN LCM1 00 1 09 31 DN 9975056 KEY 1
              INCOMING TRUNK = CKT RCHTORTPPRI 0
              CALLID = 360522
              TIME: OCT29 11:12:41
              CALLING NUMBER = 2149975015
              SOURCE = CHARGE NUMBER
LINELOGS      *LINE125 OCT29 11:13:52 8000 INFO TRACE_ON_MALICIOUS_CALL_INITIATED
              LEN RLCM 00 0 10 00 DN 9975002
              INCOMING TRUNK = CKT RCHTORTPPRI 1
              CALLID = 360344
              CALLING NUMBER = 2149975015
              SOURCE = CHARGE NUMBER
LINELOGS      *LINE117 OCT29 11:15:07 5800 INFO CALLING LINE IDENT
              LEN LCM1 00 1 09 31 DN 9975056 KEY 1
              INCOMING TRUNK = CKT RCHTORTPPTS 0
              CALLID = 360456
              TIME: OCT29 11:15:07
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE
LINELOGS      *LINE125 OCT29 11:16:48 8000 INFO TRACE_ON_MALICIOUS_CALL_INITIATED
              LEN RLCM 00 0 10 00 DN 9975002
              INCOMING TRUNK = CKT RCHTORTPPTS 1
              CALLID = 360613
              CALLING NUMBER = $
              SOURCE = UNAVAILABLE

```

User interface

CCM: SOC for LINE 117 and LINE 125 Enhancements does not change the user interface.

Billing

CCM: SOC for LINE 117 and LINE 125 Enhancements does not affect billing.

AX0940

XPM: NI-2 User Access Development

Functionality name

XPM: NI-2 User Access Development

Description

This feature provides the required XPM software changes to allow the NI-2 user side requirements in the computing module (CM) to function properly through the XPM peripheral.

This feature is related to ISDN PRI NI-2 user side and focuses on the following items:

- basic call
- calling line identification (limited to calling number)
- 20 T1s per D-channel

Note: Although 20 T1s per D-channel are assignable in the software, Nortel does not recommend that many. The amount assigned is traffic dependent.

- D-channel backup
- call-by-call

Accompanying feature

This feature works in conjunction with feature AX0912, CNA: NI-2 User Access Development.

Hardware requirements

XPM: NI-2 User Access Development has no hardware requirements.

Limitations and restrictions

XPM: NI-2 User Access Development has no limitations or restrictions.

Interactions

XPM: NI-2 User Access Development interacts with feature AX0912.

Datafill

XPM: NI-2 User Access Development does not affect data schema tables or office parameters.

AX0940

XPM: NI-2 User Access Development (end)

Service orders

XPM: NI-2 User Access Development does not affect SERVORD.

Operational measurements

XPM: NI-2 User Access Development does not affect operational measurements.

Logs

XPM: NI-2 User Access Development does not affect logs.

User interface

XPM: NI-2 User Access Development does not change the user interface.

Billing

XPM: NI-2 User Access Development does not affect billing.

AX0941

XPM: Call Join

Functionality name

XPM: Call Join

Description

This feature makes modifications to the XPM layer to support the Call Join feature. For information on Call Join, refer to feature AX1160, MSL: Call Join.

Hardware requirements

XPM: Call Join has no hardware requirements.

Limitations and restrictions

XPM: Call Join has no limitations or restrictions.

Interactions

XPM: Call Join has no functionality interactions.

Datafill

XPM: Call Join does not affect data schema tables or office parameters.

Service orders

XPM: Call Join does not affect SERVORD.

Operational measurements

XPM: Call Join does not affect operational measurements.

Logs

XPM: Call Join does not affect logs.

User interface

XPM: Call Join does not change the user interface.

Billing

XPM: Call Join does not affect billing.

AX0942
XPM: Flexible LEN

Functionality name

XPM: Flexible LEN

Description

This feature supports the data mode key (DTMK) option. For more information on the Flexible LEN feature, refer to the descriptions of features AX0913 and AX0947.

When the DTMK option is assigned to a secondary directory number (DN), the MSL-100 system informs the Symposium Communicator card that the secondary DN has the DTMK option assigned to it. The Communicator card sends a message to the XPM to originate or answer a call. The XPM recognizes this message as an origination message and acts accordingly. When the user presses the secondary DN that has the DTMK option assigned to it, the pressed key is ignored. Only an origination from the Communicator card is accepted for that key.

Accompanying features

This feature works in conjunction with the following features.

- AX0913, CCM: Flexible LEN
- AX0947, MSL: Flexible LEN

Hardware requirements

Refer to feature AX0913, CCM: Flexible LEN for hardware information.

Limitations and restrictions

Refer to features AX0913 and AX0947 for limitations and restrictions.

Interactions

All other key features are incompatible with the DTMK option.

Datafill

Refer to features AX0913 and AX0947 for data fill information.

Service orders

Refer to feature AX0947, MSL: Flexible LEN, for service orders information.

Operational measurements

XPM: Flexible LEN does not affect operational measurements.

AX0942

XPM: Flexible LEN (end)

Logs

XPM: Flexible LEN does not affect logs.

User interface

XPM: Flexible LEN does not change the user interface.

Billing

XPM: Flexible LEN does not affect billing.

AX0946**MSL: Call Forward Time of Day**

Functionality name

MSL: Call Forward Time of Day

Description

Call Forward Time of Day (CFTOD) forwards calls based on the day of the week or year, and the time of day. Before this feature, users could forward all calls to a specific directory number (DN) using the Call Forward Universal (CFU) feature, or they could forward all calls to a specific internal DN (within the same customer group) using the Call Forward Intragroup (CFI) feature.

This feature supports Meridian business sets (MBS), integrated voice and data (IVD) sets, Integrated Services Digital Network (ISDN) sets, and integrated business network (IBN) sets. The sets are required to have CFU or CFI assigned to them before CFTOD can be assigned.

CFTOD is added to key 1 for keysets and is active, by default, in service orders (SERVORD).

CFTOD allows separate forwarding DNs for internal, external, and data calls by allowing each phone to be given three TODNAMEs at the SERVORD prompt. These TODNAMEs have their own forwarding scheme defined in table TIMEODAY. CFTOD information is displayed using the CI commands QLEN, QDN, and QLT.

Accompanying feature

This feature works in conjunction with feature AX0914, CCM: Call Forward Time of Day.

Setting up CFTOD

The following sections describe how to set up the tables required for CFTOD to work properly. For more information, refer to the *Translations Guide*.

Time of Day tables

Before CFTOD is added to a phone using SERVORD, a TODNAME, a default CFTOD reference for that TODNAME, and the day types that are allowed to be forwarded must be datafilled within table TODHEAD. The times for the

AX0946**MSL: Call Forward Time of Day** (continued)

TODNAME must also be datafilled within table TIMEODAY and the forwarding DNs should be datafilled in table CFTODDN.

Example datafill for table TODHEAD

TODNAME	TODTYPE	DAYTYPES
ENGREXT	CFTOD 0	(WEEKDAY)\$
ENGRINT	CFTOD 0	(WEEKDAY) (WEEKEND) (HOLIDAY)\$
ENGRDATA	CFTOD 0	(WEEKDAY)\$
ENGRUNIV	CFTOD 0	(WEEKDAY) (WEEKEND) (HOLIDAY)\$
MKTGINT	CFTOD 0	(WEEKEND) (HOLIDAY)\$

Example datafill for table TIMEODAY

TODNAME	DAYTYPE	TIME	DATA
ENGREXT	WEEKDAY	9 0	CFTOD 0
ENGREXT	WEEKDAY	16 30	CFTOD 1
ENGRINT	WEEKDAY	8 0	CFTOD 0
ENGRINT	WEEKDAY	17 0	CFTOD 1
ENGRDATA	WEEKDAY	0 0	CFTOD 1
ENGRUNIV	WEEKDAY	0 0	CFTOD 1
ENGRUNIV	WEEKDAY	8 15	CFTOD 0
ENGRUNIV	WEEKDAY	18 30	CFTOD 1
ENGRUNIV	WEEKEND	8 0	CFTOD 2
ENGRUNIV	WEEKEND	14 0	CFTOD 3
MKTGINT	WEEKEND	0 0	CFTOD 1
MKTGINT	HOLIDAY	0 0	CFTOD 2

Note: Time is in military hours, HH MM. DNs listed as a 0 in table TIMEODAY are used to terminate the call to the station's DN or to be processed by other features or line options.

AX0946**MSL: Call Forward Time of Day** (continued)**Example datafill for table CFTODDN**

TODNAME	TODREF	CFTODDN
ENGREXT	1	8645010
ENGRINT	1	8645000
ENGRDATA	1	8645020
ENGRUNIV	1	8645020
ENGRUNIV	2	8645000
ENGRUNIV	3	8645010
MKTGINT	1	9974100
MKTGINT	2	9975120

Service orders

When setting up CFTOD in SERVORD, the TOD tables must be pre-datafilled to complete the set up. Examples of SERVORD prompts for setting up CFTOD to a phone and QLEN examples are shown in the following figures.

AX0946

MSL: Call Forward Time of Day (continued)

Example datafill for adding CFTOD with separate forwarding for internal and external calls

```
SO:
>ADO
SONUMBER:
>
DN_OR_LEN:
>9975120
OPTKEY:
>1
OPTION:
>CFTOD
TODNAME_INT:
>ENGRINT
TODNAME_EXT:
>ENGREXT
OPTKEY:
>$
```

TODNAME_INT references the TODNAME associated with calls that originate from internal DNs. The TOD tables associate this TODNAME with the tuples beginning with this name in the key field of tables TIMEODAY, TODHEAD, DAYOWEEK, and DAYOYEAR.

TODNAME_EXT references the TODNAME associated with calls that originate from external DNs. The TOD table associates this TODNAME with the tuples beginning with this name in the key field of tables TIMEODAY, TODHEAD, DAYOWEEK, and DAYOYEAR.

When setting up a phone capable of receiving a data call, SERVORD prompts for the TODNAME_DATA. The TODNAME_DATA prompt references the TODNAME associated with originating data calls.

The line class codes (LCC) that are capable of receiving a TODNAME_DATA prompt are ISDNKSET, DATA, PDATA, MCA, MPDA, M2006, M2008, M2016S, M2216A, M2216B, M2616, and M2616CT.

AX0946

MSL: Call Forward Time of Day (continued)

QLEN-example datafill for CFTOD (forward internal and external calls)

LEN: LCM0 00 0 00 08
TYPE: SINGLE PARTY LINE
SNPA: 214
DIRECTORY NUMBER: 9975120
LINE CLASS CODE: M5212 SET
CUSTGRP: BNRRCH SUBGRP: 0 NCOS: 0 RING: Y
CARDCODE: 6X21AC GND: N PADGRP: NPDGP BNV: NL MNO: Y
PM NODE NUMBER : 38
PM TERMINAL NUMBER : 9
OPTIONS:
NAME PUBLIC FRED FLINTSTONE
CFU N \$ I \$

KEY	DN	
---	--	
1	DN	9975120
2	DN	6577120
3	DN	8208120

KEY	FEATURE	
---	-----	
1	CFTOD	ENGRINT ENGEXT NILTODNM Y N
4	CFU	N \$I\$

AX0946

MSL: Call Forward Time of Day (continued)

Example datafill for adding CFTOD with forwarding for internal calls

```
SO:  
>ADO  
SONUMBER:  
>  
DN_OR_LEN:  
>9975120  
OPTKEY:  
>1  
OPTION:  
>CFTOD  
TODNAME_INT:  
>ENGRINT  
TODNAME_EXT:  
>NILTODNM  
OPTKEY:  
>$
```

Calls to this DN are only screened on internal calls for TOD forwarding because only one TODNAME for the entry TODNAME_INT is entered.

AX0946

MSL: Call Forward Time of Day (continued)

QLEN-example datafill for CFTOD (forward only internal calls)

LEN: LCM0 00 0 00 08
TYPE: SINGLE PARTY LINE
SNPA: 214
DIRECTORY NUMBER: 9975120
LINE CLASS CODE: M5212 SET
CUSTGRP: BNRRCH SUBGRP: 0 NCOS: 0 RING: Y
CARDCODE: 6X21AC GND: N PADGRP: NPDGP BNV: NL MNO: Y
PM NODE NUMBER : 38
PM TERMINAL NUMBER : 9
OPTIONS:
NAME PUBLIC FRED FLINTSTONE
CFU N \$ I 1 3

KEY DN
--- --
1 DN 9975120
2 DN 6577120
3 DN 8208120

KEY FEATURE
--- -----
1 CFTOD ENGRINT NILTODNM NILTODNM Y N
4 CFU N \$I 1 3

AX0946

MSL: Call Forward Time of Day (continued)

Example datafill for adding CFTOD with forwarding for all calls

```
SO:  
>ADO  
SONUMBER:  
>  
DN_OR_LEN:  
>9975120  
OPTKEY:  
>1  
OPTION:  
>CFTOD  
TODNAME_INT  
>ENGRINT  
TODNAME_EXT  
>ENGREXT  
OPTKEY:  
>$
```

Calls to this DN are screened and forwarded on internal and external calls because one TODNAME was entered for the entries TODNAME_INT and TODNAME_EXT.

AX0946**MSL: Call Forward Time of Day** (continued)**QLEN-example datafill for CFTOD (forward all calls)**

```

LEN:      LCM0  00 0 00 08
TYPE: SINGLE PARTY LINE
SNPA: 214
DIRECTORY NUMBER:      9975120
LINE CLASS CODE:  M5212 SET
CUSTGRP:      BNRRCH SUBGRP: 0 NCOS: 0 RING: Y
CARDCODE:  6X21AC GND: N PADGRP: NPDGP BNV: NL MNO: Y
PM NODE NUMBER      :      38
PM TERMINAL NUMBER  :      9
OPTIONS:
NAME PUBLIC FRED FLINTSTONE
CFU N $ I 1

KEY      DN
---      --
  1      DN      9975120
  2      DN      6577120
  3      DN      8208120

KEY      FEATURE
---      -
  1      CFTOD      ENGRINT ENGEXT  NILTODNM Y N
  4      CFU        N $I 1

```

Note: All of the TODNAMEs used in the preceding examples are defined in tables TIMEODAY, TODHEAD, and CFTODDN.

CFTOD activation, deactivation, and override codes

The activation, deactivation, and override codes for CFTOD are defined in table IBNXLA.

Example datafill for table IBNXLA (Sheet 1 of 2)

Key		Result
FRCH	88	FEAT N Y CFTODACT
FRCH	89	FEAT N Y CFTODDEACT

AX0946**MSL: Call Forward Time of Day** (continued)

Example datafill for table IBNXLA (Sheet 2 of 2)

Key		Result
FRCH	90	FEAT N Y CFTOVRACT
FRCH	91	FEAT N Y CFTOVRDACT

An activation code is used to activate CFTOD (for example, *88). Once CFTOD is active, the user hears a tone confirmation and each call is processed upon the set's TOD information.

A deactivation code (for example, *89) is used to deactivate CFTOD. When CFTOD is deactivated, all calls terminate to the set's DN or are processed by other features or line options.

While CFTOD is active, the line option can be overridden using a code for all sets related to this line option (for example, *90). The override may also be deactivated using another code (for example, *91).

The following examples illustrate using this feature for overriding CFTOD when arriving at work early, leaving work early, and leaving for a period of time during the day. An entry of either of the override codes has no effect if CFTOD is not active. The examples use the ENGRUNIV TODNAME as defined in tables TODHEAD and TIMEODAY example datafill.

Example 1: arriving early-override

In this example, the user works from 8:15 am to 18:30 (6:30 pm) on weekdays. The CFTOD for this user's phone is datafilled with ENGRUNIV as the TODNAME for internal and external calls. This forwards calls to the DN 864-5020 using CFTOD before 8:15 and after 18:30 of each day and terminates to the user's desk phone in the time between.

The user starts working at 7:30, dials the override activation code, and hears the confirmation tone. All calls before 8:15 now terminate to the user's phone instead of the defined forwarding DN. Upon receiving the first call where the TIMEODAY tuple contains a different TODREF from when override was activated, the override is automatically deactivated making CFTOD resume the processing of calls based on the day of week or year and time of day.

Example 2: leaving early-override

In this example, the user leaves work early at 4:30 pm. The time of day information remains the same from example 1. The user dials the override activation code and hears a confirmation tone. From 4:30 pm to 6:30 pm all

AX0946**MSL: Call Forward Time of Day** (continued)

calls received are forwarded to 864-5010 instead of the user's desk phone. Upon receiving the first call where the TIMEODAY tuple contains a different TODREF from when override was activated, the override is automatically deactivated making CFTOD resume the processing of all calls based on the day of the week or year and time of day.

Example 3: leaving early and returning before end of the day-override

In this example, the user has an off-site meeting from 2:00 pm to 3:00 pm and plans to return to work after the meeting. The user wants the calls forwarded during the time of the meeting and then have calls terminate back at his desk from 3:00 pm to 6:30 pm. The user dials the override activation code and hears a confirmation tone. When the user returns from the meeting, he enters the override deactivation code to deactivate the override so that CFTOD resumes the processing of calls based on the day of the week or year and time of day.

Hardware requirements

MSL: Call Forward Time of Day has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to MSL: Call Forward Time of Day:

- CFU or CFI must be set up on the phone before CFTOD is added
- the maximum number of TODNAMEs that can be defined in table TODHEAD is 255
- CFTOD only supports MBS, IVD, ISDN, and IBN sets
- CFTOD can only be assigned to key one
- Defense Switched Network (DSN) does not support CFTOD

Interactions

The following paragraphs describe the interactions between MSL: Call Forward Time of Day and other functionalities.

AX0946**MSL: Call Forward Time of Day** (continued)

The following table illustrates how CFTOD interacts with features CFU and CFI.

CFU/CFI interaction with CFTOD

CFU/CFI	CFTOD	Interaction
Inactive	Inactive	Calls terminate to dialed DN
Active	Inactive	Calls forward to DN defined by CFU/CFI
Inactive	Active	CFTOD
Active	Active	CFU/CFI with CFTOD priority

CFTOD is checked first to determine if it is active. CFU/CFI are checked after CFTOD. If CFTOD is active, the proper TODNAME is determined for forwarding purposes by determining whether the originator is an internal or external call. Tables TIMEODAY, CFTODDN, and TIMEODAY are checked with the correct TODNAME to see if a DN is assigned for forwarding at the time of the call. If there is no forwarding number at the time and CFU is active, the call is forwarded through CFU.

However, when both CFTOD and CFU/CFI are active, each call is checked to see if it falls within a defined time that is in table TIMEODAY. The DN within table CFTODDN for that TODNAME, if any, has precedence over any other DN.

Note: Features CFU and CFI do not change in any way because of CFTOD.

Example-CFU/CFI interaction with CFTOD

A user in the engineering department has his phone set up with CFI and CFTOD with internal calls being forwarded through CFTOD. At 2:30 pm, the user decides to work in the lab, so he programs CFI to forward the internal calls to the lab. At 3:00 pm, a call is sent to the phone in the lab. CFTOD first checks table TIMEODAY to determine if there is a forwarding DN defined for that time and TODNAME. Since a '0' is indicated for this time, the call goes through CFI and is forwarded to the lab. The user spends the rest of the work day in the lab and leaves work from there, not deactivating CFI on his phone. The user gets another call at 5:30 pm. CFTOD is checked again to determine if there is a forwarding DN defined for that time of day. There is, and the call is forwarded to DN 864-5000 by CFTOD.

AX0946**MSL: Call Forward Time of Day (end)**

Datafill

Table LCCOPT is modified to allow the line option CFTOD to be datafilled for MBS, IVD, IBN, and ISDN sets.

Table IBNXLA is modified to use the feature access codes for activating, deactivating, and overriding CFTOD. The feature names for the access codes are:

- CFTODACT-activate the CFTOD option
- CFTODDEACT-deactivate the CFTOD option
- CFTOVRACT-override CFTOD
- CFTOVRDACT-deactivate CFTOD override

Tables IBNFEAT and KSETFEAT store the data feature tuple for the CFTOD option.

Table CFTODDN stores the DN used to forward the CFTOD calls. CFTODDN's key is made up of valid TODNAMEs, that are datafilled in table TODHEAD, and a unique reference number from 0 to 32767.

Service orders

Adding, deleting, or changing CFTOD for a DN is done with SERVORD.

Operational measurements

MSL: Call Forward Time of Day does not affect operational measurements.

Logs

A log is generated when CFTOD is activated, deactivated, and overridden.

User interface

MSL: Call Forward Time of Day does not change the user interface.

Billing

MSL: Call Forward Time of Day does not affect billing.

AX0947

MSL: Flexible LEN

Functionality name

MSL: Flexible LEN

Description

This feature supports servord information required for Flexible LEN. For more information on the Flexible LEN feature, refer to descriptions of features AX0913 and AX0942.

This feature supports all MSL layer modifications including the following.

- Reads, writes, and deletes the FLXA card type when performing a list, add, change, or delete in table LNINV table control.
- Provides the check for the FLXA card type to disable the servord and table IVDINV table control restriction of even/voice and odd/data LEN assignments.
- Creates a new line option, DTMK, by providing servord and table control functions.

Accompanying features

This feature works in conjunction with the following features.

- AX0913, CCM: Flexible LEN
- AX0942, XPM: Flexible LEN

Hardware requirements

Refer to feature AX0913, CCM: Flexible LEN, for hardware information.

Limitations and restrictions

The following limitations and restrictions apply to MSL: Flexible LEN:

- The FLXA option can only be assigned to LENs on digital IPE line cards.
- The DTMK option can only be assigned to one secondary DN on M2008, M2008HF, M2616, M2616CT, and M2216A/B IVD sets.
- The DTMK option cannot be assigned to a secondary DN that has the AUL feature assigned to it.

Interactions

The AUL feature is incompatible with the DTMK option.

AX0947**MSL: Flexible LEN** (continued)**Datafill**

Two tables are updated for this feature:

- table LNINV
- table KSETFEAT

Table LNINV

The FLXA value is added to field CARDINFO type.

Note: The MICB card is automatically datafilled as an NT5051 cardtype in table LNINV.

The following is an example of FLXA.

LEN CARDCODE PADGRP STATUS GND BNV MNO CARDINFO-

IPE0 00 0 00 00 8D02AB NPDGP HASU N NL Y FLXA

Table KSETFEAT

The DTMK value is added to the field FEATURE type (refer to feature description AX0947).

The following is an example of DTMK.

FEATKEY FEATURE KVAR

IPE0 00 0 00 00 2 DTMK DTMK

The range of the CARDINFO field in table LNINV includes the FLXA option.

The option, DTMK, is added to table KSETFEAT.

AX0947
MSL: Flexible LEN (continued)

TABLE: KSETFEAT									
>list									
					FEAT KEY		FEATURE		KVAR

IPE0	00	0	00	00	0	DTMK	DTMK		
>range feature									
2		FEATURE		KEY_SET_FEATURE					
TYPE IS		KEY_SET_FEATURE		{AUL, SPB, DIN, SLU, PBL, CLI, DND, RMB, RSUS, SHU, SDY, SEC, RLS, HLD, CUG, KSH, CFDVT, BC, CXR, 3WC, CNF, CWT, RAG, PRL, CFX, AUD, CPU, SCS, SCL, ICM, MSB, MCH, PRK, EBO, NRS, QTD, INSPECT, MWT, AAB, DCPK, EMK, ACDNR, ASL, OBS, NGTSRVCE, DQS FC, QBS, CLSUP, DROP, XFER, MWIDC, PRV, SSAC, SOR, UCDSO, SMDI, CFUIF, CFB, CFD, SUPR, PIC, CTD, OLS, TLS, TBO, 3WCPUB CPR, DRING, WML, AR, CNDB, COT, AUTODISP, ALI, BCLID, MBK, SCMP, LPIC, SACB, AIN, SETMODEL, CFTB, CFTD, FCTDNTER, FCTDNTRA, PCACIDS, AFC, MRFM, UCDLG, DQT, PR, MMI, LOCAL, BLF, EMW, CIF, LOB, LVM, CCV, MWQRY, ISOLATE, REATTACH, DASK GIAC, QCK, MBSCAMP, BCONF, FAA, ACRJ, FXR, ACOU, WUCR, HF, MUTE, HFMUTE, SOFTKEY, XXTRG, CWD, ACB, SLQ, NFA, ECM, CSMI ISA, DENYISA, ISADEACT, ASP, INTPIC, LSPA0, CFFPOVR, MSMWI VMADN, VMEADENY, CIDSDLV, CIDSSUP, CFXVAL, CFXDNCT, TRANSFER, RMI, TRKDISP, CRBL, DBC, DCC, DTMK}					

Service orders

This feature adds a new line option, DTMK.

AX0947**MSL: Flexible LEN** (continued)

Prompt Mode:

```
>servord
S0:
>ado
SONUMBER:      NOW 97  12  12 PM
>
DN_OR_LEN:
>ipe0 0 0 0 00 0
OPTKEY:
>2
OPTION:
>dtmk
OPTKEY:
>$
COMMAND AS ENTERED:
ADO NOW 97 12 12 PM IPE0 00 0 00 00 ( 2 dtmk ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> y
MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED
JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED
SHOULD ORDER BE DONE ANYWAY? (Y OR N)
>y
```

AX0947

MSL: Flexible LEN (end)

No-Prompt Mode:

```
>servord
S0:
ADO $ IPE0 00 0 00 00 ( 2 dtmk ) $
COMMAND AS ENTERED:
ADO NOW 97 12 12 PM IPE0 00 0 00 00 ( 2 dtmk ) $
ENTER Y TO CONFIRM, N TO REJECT OR E TO EDIT
> y
MACHINES ARE OUT OF SYNC, SERVICE ORDERS NOT ALLOWED
JOURNAL FILE IS INACTIVE, SERVICE ORDERS NOT ALLOWED
SHOULD ORDER BE DONE ANYWAY? (Y OR N)
>y
```

Error messages are provided in the following situations.

- adding option DTMK to a primary key
- adding option DTMK to a non-DN key
- adding option DTMK to more than one secondary DN
- adding option DTMK to an incompatible set
- adding option DTMK to a set not attached to an intelligent peripheral equipment (IPE)
- adding option DTMK to a secondary DN that has AUL assigned to it

Operational measurements

MSL: Flexible LEN does not affect operational measurements.

Logs

MSL: Flexible LEN does not affect logs.

User interface

MSL: Flexible LEN does not change the user interface.

Billing

MSL: Flexible LEN does not affect billing.

AX1160
MSL: Call Join

Functionality name

MSL: Call Join

Description

This feature allows a user of a Meridian business set (MBS) and an integrated voice and data (IVD) set to add a held call to the second leg of a conference or 3WC call. All parties would then be joined on the same call. This eliminates the previous requirement of having to drop and redial the held party.

The MBS conference feature allows a user to establish a conference call on an MBS set by dialing and adding a potential conferee to a conference call with the CNF key. This feature allows the MBS user to add a previously held party to an existing conference call by using the CNF or 3WC keys.

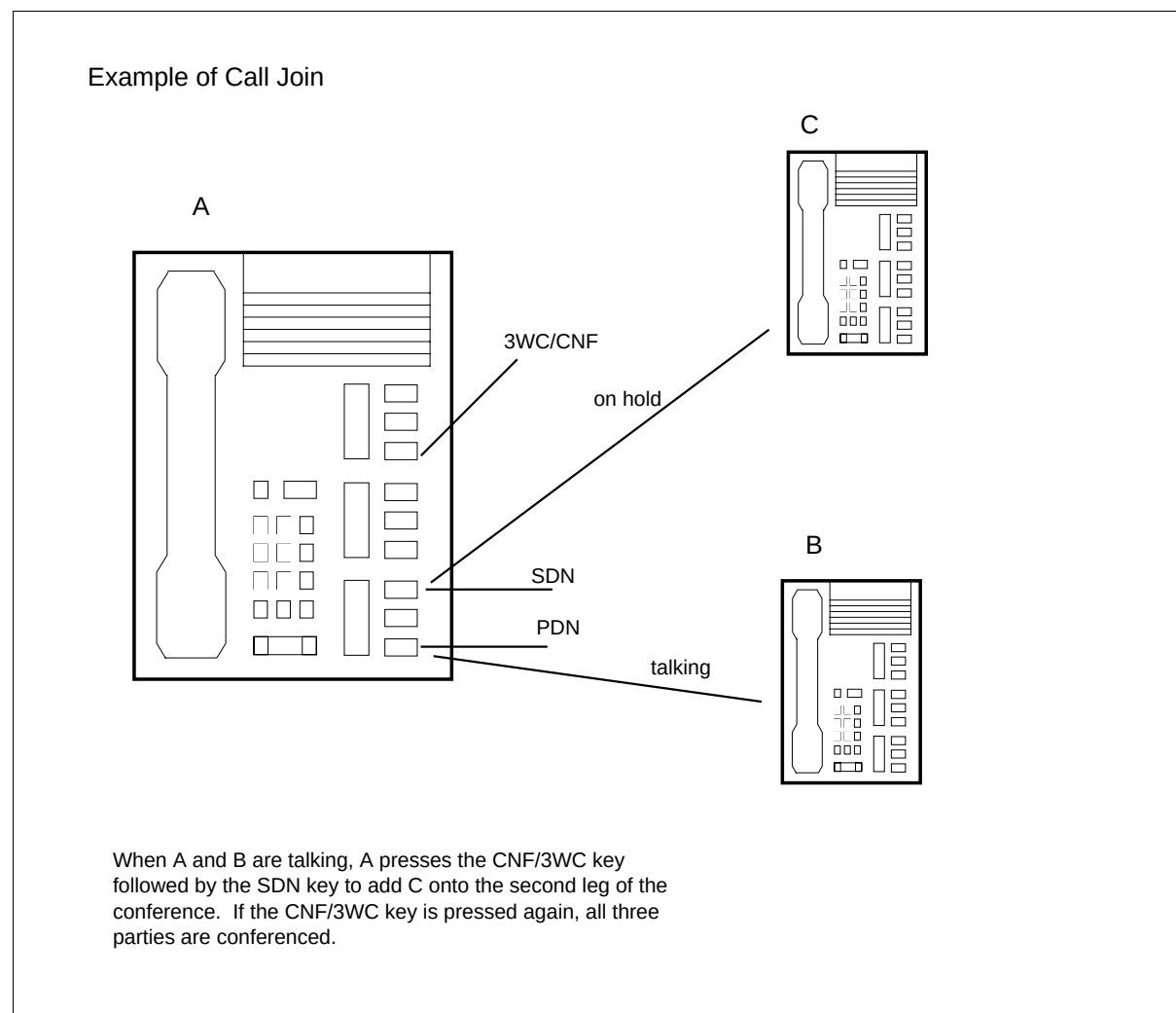
Similarly, the Three-Way Conference (3WC) feature allows the user, who is already talking to one party, to add a third party to the conversation by dialing the third party's number followed by a 3WC key.

Accompanying feature

This feature works in conjunction with feature AX0941, XPM: Call Join.

AX1160

MSL: Call Join (continued)



Using conference join

The following must be present before beginning a conference join operation.

- the CNF key
- The JOIN option must be assigned to the MBS and IVD sets.
- The user must be on an active phone call.
- A call that is to be joined must be on hold on the same MBS or IVD set.

AX1160**MSL: Call Join** (continued)

The user controlling the conference call performs the following conference join operations.

- Another call on the secondary directory number (SDN) is on hold.
- While on the active call, press the CNF key. A special dial tone is heard. The CNF lamp comes on and the DN lamp flashes.
- The caller presses the held DN key to add the held call to the conference. Dial tone stops, the CNF lamp remains solid, and the caller converses privately with the party added. The held key's lamp goes off and the display is updated appropriately.

Note: The remainder of this operation works the same as the MBS 30-port conference feature.

- Once the caller is conversing with the party privately (using the CNF key), he returns to the conference call on the PDN by pressing the PDN key. The party with whom the caller was privately conversing with is placed on hold. The CNF lamp flashes and the PDN lamp becomes solid. To return to the party on hold, the caller toggles as many times as desired.
- To add the party to the conference, the caller presses the CNF key again. The CNF lamp goes off and the DN's lamp becomes solid. A conference tone alerts the conferees that a party is joining the conference. The tone is also applied when a party goes on hook and leaves the conference.

Using 3WC join

The following must be present before beginning a 3WC join operation.

- the 3WC key
- The JOIN option must be assigned to the MBS and IVD sets.
- The user must be on an active phone call.
- A call that is to be joined must be on hold on the same MBS or IVD set.

The user controlling the conference call performs the following 3WC join operations.

- The caller presses the 3WC key and receives a special dial tone. The 3WC lamp comes on and the active DN lamp flashes.
- The caller presses the held call key to add the held call to the second leg of the three-way conference. The dial tone stops, the 3WC lamp remains

AX1160

MSL: Call Join (continued)

solid, and the caller converses privately with the added party. The held key's lamp goes off. The display updates appropriately.

Note: The remainder of this operation works the same as the MBS Three-Way Calling feature.

- Once the caller is conversing with the party privately (on the 3WC key), he returns to the call on the PDN by pressing the PDN key. The party with whom the controller was privately conversing with is placed on hold. The 3WC lamp then flashes and the PDN lamp becomes solid. To return to the party on hold, the caller toggles as many times as desired.
- To add the party to the conference, the caller presses the 3WC key again. The 3WC lamp goes off and the PDN lamp becomes solid. A conference tone is used to alert the conferees that a party is joining the 3WC conference. The tone is also applied when a party goes on hook and leaves the conference.
- To drop the party just added, the caller presses the 3WC key again.

Error conditions

The join operation receives a negative acknowledgement (NACK) when a held call is on the call appearance, but the call cannot be joined. This could be because the call is part of another conference, 3WC, or extended from an attendant console. Refer to "Limitations and restrictions."

Hardware requirements

MSL: Call Join only supports MBS and IVD sets.

Limitations and restrictions

Allowable Call Join appearances

MSL: Call Join allows the join action on a held call when it is on the following call appearances:

- DN key
- Call Waiting key
- MADN key
- ACD INCALLS key
- Intercom/Group Intercom key
- UCD key

AX1160**MSL: Call Join** (continued)

Supported telephone sets

MSL: Call Join only supports MBS and IVD phone sets.

Supported conferences

MSL: Call Join only applies to the Station Controlled Conference. Therefore, the Preset Conference, Meet-Me Conference, or other types of conference are not affected.

Join limitations

The existing limitations and restrictions of the Station Controlled Conference and the 3WC apply to the Call Join operation when appropriate.

Interactions

The following paragraphs describe the interactions between MSL: Call Join and other functionalities.

After the private consult leg of the conference call is successfully established with the Call Join operation, the MBS 30-port Conference feature handles further intractions throughout the remainder of the call. Refer to MBS 30-Port Conference feature for interactions.

After the private consult leg of the 3WC is successfully established with the Call Join operation, the MBS 3WC feature handles further interactions throughout the remainder of the call.

The following feature interactions are specific to the Call Join operation.

- Attendant Console-If the held call to be joined was extended from an attendant console, then the Call Join is not allowed. The caller receives NACK treatment.
- Call Waiting-Only an answered call on a call waiting key can be joined.
- Call Transfer-The call transfer type applies to the 3WC Join.
- Flexible Station Controlled Conference, Meet-Me Conference, Preset Conference-If the held call to be joined is part of another conference, the Call Join is not allowed. The caller receives NACK treatment.
- 3WC-If the held call to be joined is a terminating leg of another 3WC, the Call Join is not allowed. The caller receives NACK treatment.
- MADN-The existing feature interactions with MBS Conference and 3WC also apply to the Call Join operation. If the conference controller is on a MADN bridged call, then the Call Join is not allowed. However, 3WC Join is allowed for each current feature. If the held call is part of a MADN

AX1160

MSL: Call Join (end)

bridged call, it is not allowed to be joined. A held MADN selected call appearance (SCA) call can only be joined from the same set as the MADN member which placed the call on hold. Any other member of the MADN group must first become the active member on the call and explicitly place the call on hold prior to joining the held MADN SCA call.

Datafill

MSL: Call Join adds a new line option in table KSETFEAT. JOIN is assignable to the PDN of an MBS and IVD set. The JOIN tuple is added in table KSETFEAT once the option is successfully added to the set using SERVORD.

Note: The user should not add or delete the JOIN tuple using table control commands. The option should only be added or removed using SERVORD.

Table LCCOPT is updated to include JOIN for the MBS line class codes.

Service orders

MSL: Call Join supports service orders in the following manner.

- Service order commands such as ADO, DEO, EST, and NEW can be used on the JOIN option.
- The JOIN option can only be assigned to the PDN of an MBS or IVD set. When adding the JOIN option, a check is made to ensure CNF or 3WC is also assigned to the set.
- The JOIN option can be removed from a set by using the DEO command. When the CNF and 3WC features are deleted from the set, the JOIN option is also removed. A warning message is given because the JOIN option is meaningless without either CNF or 3WC configured.

Operational measurements

MSL: Call Join does not affect operational measurements.

Logs

MSL: Call Join does not affect logs.

User interface

MSL: Call Join does not change the user interface.

Billing

MSL: Call Join does not affect billing.

AX1221
CCM: IVD Decouple

Functionality name

CCM: IVD Decouple

Description

The purpose of this feature is to move integrated voice and data (IVD) specific code into the MSL layer from the lower layers. This move improves the maintainability and adaptability of the software.

The functionality provided by this software includes call processing, service orders (SERVORD) feature checking and feature interactions, and table control for tables such as KSETFEAT and KSETLINE.

Hardware requirements

CCM: IVD Decouple has no hardware requirements.

Limitations and restrictions

CCM: IVD Decouple has no limitations or restrictions.

Interactions

CCM: IVD Decouple has no functionality interactions.

Datafill

CCM: IVD Decouple does not affect data schema tables or office parameters.

Service orders

CCM: IVD Decouple does not affect SERVORD.

Operational measurements

CCM: IVD Decouple does not affect operational measurements.

Logs

CCM: IVD Decouple does not affect logs.

User interface

CCM: IVD Decouple does not change the user interface.

Billing

CCM: IVD Decouple does not affect billing.

AX1223

CCM: NI-2 User Re-architecture

Functionality name

CCM: NI-2 User Re-architecture

Description

This feature redesigns the implementation of features AX0912 and AX0940, NI-2 PRI User Side. This feature creates a new PRI agent in the PRI PRO architecture, making the software more efficient. This feature is transparent to the user.

Hardware requirements

CCM: NI-2 User Re-architecture has no hardware requirements.

Limitations and restrictions

CCM: NI-2 User Re-architecture has no limitations or restrictions.

Interactions

CCM: NI-2 User Re-architecture has no functionality interactions.

Datafill

CCM: NI-2 User Re-architecture does not affect data schema tables or office parameters.

Service orders

CCM: NI-2 User Re-architecture does not affect SERVORD.

Operational measurements

CCM: NI-2 User Re-architecture does not affect operational measurements.

Logs

CCM: NI-2 User Re-architecture does not affect logs.

User interface

CCM: NI-2 User Re-architecture does not change the user interface.

Billing

CCM: NI-2 User Re-architecture does not affect billing.

AX1227**CCM: NI-2 User Side Development—Phase II****Functionality name**

CCM: NI-2 User Side Development—Phase II

Description

This feature brings additional NI-2 user side capabilities to the MSL-100 customer. In many MSL-100 primary rate interface (PRI) implementations, the MSL-100 switch acts as a user to a network side switch in addition to acting as the network side to a subtending PBX.

This feature provides the following user side functionality.

- Nx64/Dialable Wideband Services (DWS)

Note: This functionality relies entirely on the software written for features AF7218, PRI Dialable Wideband Service, and AX0510, DMS-100 DWS XPM PRI. These features implement Dialable Wideband for the NI-2 PRI on the networking side. Refer to the *DMS-100 Feature Description Manual* for more information.

- Calling Name Delivery
 - Calling Name Delivery
 - Preferred name Presentation Status (Octet 3a in the Calling Party Number Information Element)
 - Link Calling Name presentation to Calling Number

Note: This functionality relies on the software written for features AF7209, PRI Calling Name, and AX0518, XPM PRI Calling Name. These features implement the ISDN Calling Name Delivery for PRI on the networking side. Refer to the *DMS-100 Feature Description Manual* for more information.

For more information and details, refer to the *Meridian SL-100 ISDN PRI Reference Manual*.

Accompanying feature

This feature works in conjunction with feature AX1245, XPM: NI-2 User Side Development—Phase II.

Nx64/Dialable Wideband Services

Nx64/Dialable Wideband Services provides end-to-end wideband connectivity on PRI and ISDN user part (ISUP) circuits. This feature provides

AX1227

CCM: NI-2 User Side Development—Phase II (continued)

the call processing necessary for the NI-2 PRI user side trunk originations and terminations for wideband calls.

DWS provides on-demand Nx64 Kbps calls. The number of channels, labeled N, can range from two to 24. The N value provides data transfer rates ranging from 64 Kbps to 1.536 Mbps, in increments of 64 Kbps, for a single call through the network.

All of the 64 Kbps DS0 channels used on the incoming or outgoing wideband call must reside on the same DS1 span or T1 carrier, and in the same trunk group. The procedure for establishing DWS calls is similar to the procedure for establishing a basic 64 Kbps circuit switched ISDN call.

DWS is supported on Nortel North America (NTNA) PRI and on the network side of NI-2 PRI products. This feature does not affect the current DWS PRI products, but does provide interworking with the existing DWS PRI.

Dialable Wideband Services are provided by having multiple circuit switched DS0 channels grouped together for one call, thereby providing a higher bit rate channel for the call as a whole. The bit rate can only be increased in increments of 64 Kbps. All of the following throughput values are supported for all valid N values from two to 24. Refer to the following table.

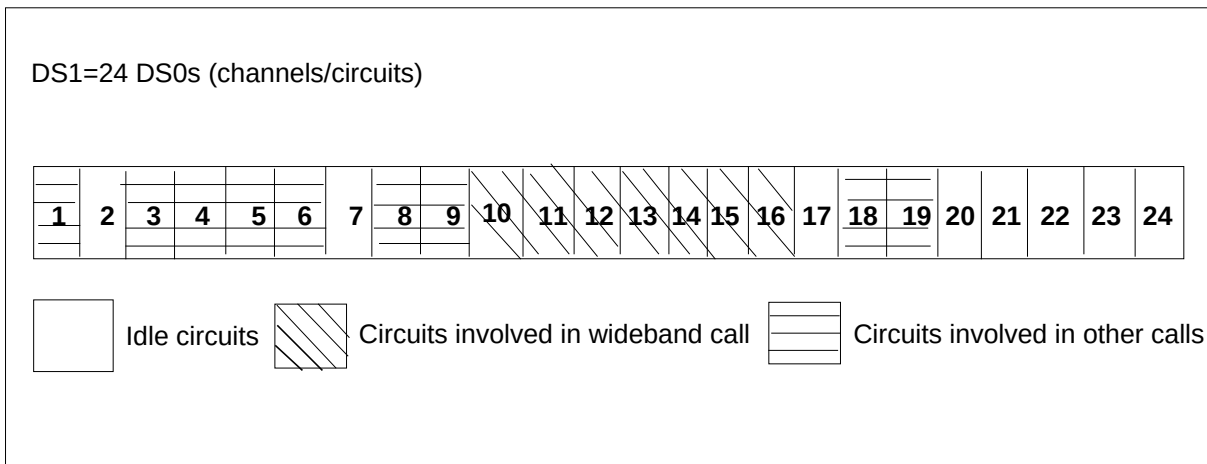
Sample table Nx64 throughput values

N value	Data throughput	N value	Data throughput	N value	Data throughput
2	128Kbps	10	640Kbps	18	1.152Mbps
3	192Kbps	11	704Kbps	19	1.216Mbps
4	256Kbps	12	768Kbps	20	1.280Mbps
5	320Kbps	13	832Kbps	21	1.344Mbps
6	384Kbps	14	896Kbps	22	1.408Mbps
7	448Kbps	15	960Kbps	23	1.472Mbps
8	512Kbps	16	1.024Mbps	24	1.536Mbps
9	576Kbps	17	1.088Mbps		

AX1227**CCM: NI-2 User Side Development—Phase II** (continued)

The preceding figure illustrates the fixed format, which is the most restrictive of the wideband trunk grouping methods.

Floating selection Floating selection is defined by selecting any N consecutive channel on the DS1 span. These consecutive channels can start at any point in the DS1 span, but must all reside on the same DS1. Refer to the following figure.

Sample figure floating format

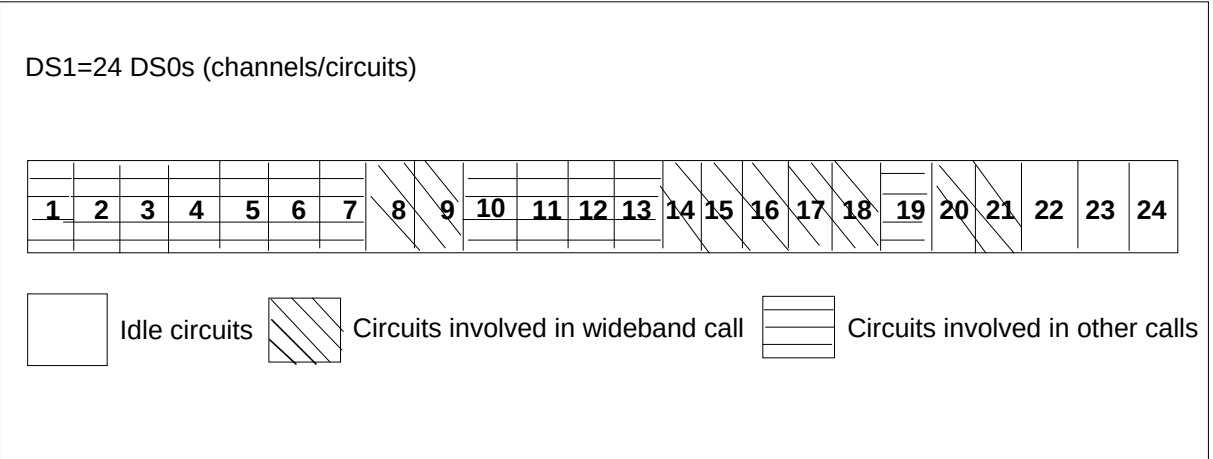
The preceding figure illustrates the floating format which is less restrictive than the fixed method of trunk grouping.

Flexible selection Flexible selection is defined by selecting any N DS0 channel in the DS1 span which will be used for the wideband call. Because this routine allows for the selection of DS0s in a random fashion, it works to reduce fragmentation on the DS1 by being able to select those fragmented idle channels on the DS1. Refer to the following figure.

AX1227

CCM: NI-2 User Side Development—Phase II (continued)

Sample figure flexible format



The flexible trunk grouping method is the least restrictive of the three trunk grouping methods.

Calling Name Delivery

For the user side of NI-2 PRI, the Bellcore Standard SR-3887 calls for the customer premises equipment (CPE) switch to accept the name for the calling party in a facility information element (IE) that is included in either a SETUP or a FACILITY message.

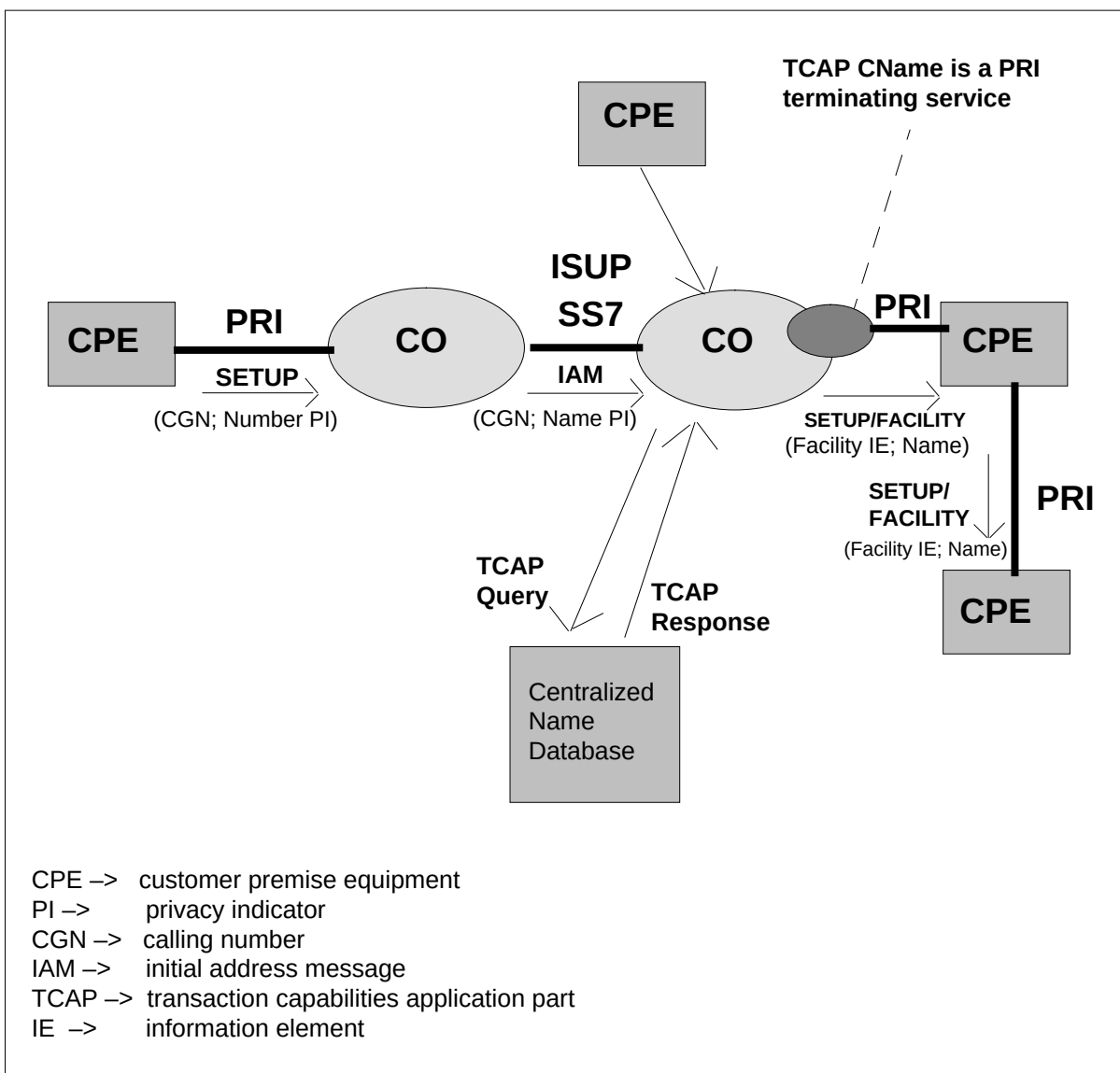
The calling party name information is only sent by the network side of the NI-2 PRI facility if the preferred name presentation status field of the Calling_Party_Number information element indicates Presentation Allowed. If it does not indicate Presentation Allowed, the calling party name information will not be sent by the network to the user. Therefore, once the user side receives the calling party name information in the facility information element, the user side assumes that it is allowed to present the name and number of the calling party.

The CPE (for example, an MSL-100 switch) may serve as a user side switch to the network and as a network side switch to another switch (for example, a Meridian 1 PBX). Therefore, the network side ISDN PRI Calling Name Deliver (I-CNAM) feature is modified to accept name information from an NI-2 PRI user side trunk. Additionally, it can accept name information from an SS7 trunk, if the CPE is being used as a network side switch. This way, the name information is built into the SETUP message by the network side in order to send it to the user side of the next PBX. Refer to the following figure.

AX1227

CCM: NI-2 User Side Development—Phase II (continued)

Sample figure CPE used as user side and network side switch



Message delivery: Nx64/Dialable Wideband

DWS uses only the SETUP message. The SETUP message is sent by the user or the network to initiate call establishment. Since narrowband calls are allowed on wideband trunks, both narrowband and wideband calls may originate on the same wideband trunk.

AX1227**CCM: NI-2 User Side Development—Phase II** (continued)

A wideband call is distinguished from a narrowband call by the following information elements in the SETUP message that is received from the originating PRI trunk.

- bearer capability (BC)
- channel identification (CID)

Together, these two IEs contain the information needed to set up a wideband call. The individual B-channels grouped together to form the wideband channel are identified in the CID information element while the transfer rate is identified in the BC information element.

Bearer capability information element

The bearer capability information element (BC IE) of the NI-2 PRI SETUP message indicates the rate of the wideband call using the information transfer rate (ITR) and the transfer rate multiplier (TRM) fields. The BC IE, ITR, and TRM formats are shown in the following table.

Sample table information transfer rate

ITR 5 4 3 2 1	Meaning	Trunk selection	Bearer capability
1 0 0 0 0	64Kbps	all forms	narrowband
1 0 0 1 1	384Kbps	fixed	H0
1 0 1 0 1	1.536Mbps	fixed	H11
1 1 0 0 0	multirate (64Kbps baserate)	floating or flexible	size in TRM parameter 2 through 24 only

The information transfer rate and transfer rate multiplier fields are described in the following table.

Sample table information transfer rate/transfer rate multiplier (Sheet 1 of 2)

ITR	TRM	Meaning	ITR	TRM	Meaning
1 0 0 0 0	1 0 0 0 0	narrowband call (64Kbps)	1 1 0 0 0	0 1 1 1 0	14X64
1 1 0 0 0	0 0 0 1 0	2X64	1 1 0 0 0	0 1 1 1 1	15X64
1 1 0 0 0	0 0 0 1 1	3X64	1 1 0 0 0	1 0 0 0 0	16X64

AX1227**CCM: NI-2 User Side Development—Phase II** (continued)**Sample table information transfer rate/transfer rate multiplier (Sheet 2 of 2)**

ITR	TRM	Meaning	ITR	TRM	Meaning
1 1 0 0 0	0 0 1 0 0	4X64	1 1 0 0 0	1 0 0 0 1	17X64
1 1 0 0 0	0 0 1 0 1	5X64	1 1 0 0 0	1 0 0 1 0	18X64
1 1 0 0 0	0 0 1 1 0	6X64	1 1 0 0 0	1 0 0 1 1	19X64
1 1 0 0 0	0 0 1 1 1	7X64	1 1 0 0 0	1 0 1 0 0	20X64
1 1 0 0 0	0 1 0 0 0	8X64	1 1 0 0 0	1 0 1 0 1	21X64
1 1 0 0 0	0 1 0 0 1	9X64	1 1 0 0 0	1 0 1 1 0	22X64
1 1 0 0 0	0 1 0 1 0	10X64	1 1 0 0 0	1 0 1 1 1	23X64
1 1 0 0 0	0 1 0 1 1	11X64	1 1 0 0 0	1 1 0 0 0	24X64
1 1 0 0 0	0 1 1 0 0	12X64	1 0 0 1 1	not required	H0
1 1 0 0 0	0 1 1 0 1	13X64	1 0 1 0 1	not required	H11

When the ITR equals multirate (11000), an optional octet is present in the BC IE. This octet contains the transfer rate multiplier value that indicates the bit rate of the wideband call (that is, the number of 65kbps circuits involved in the wideband call).

The TRM is used only in the event that various Nx64Kbps capability is provided. In order to use the TRM, the ITR is set to 11000 for multirate (64Kbps base rate) and the TRM is encoded to the value of N in Nx64. The bandwidth is calculated by multiplying the ITR with the TRM.

Channel identification (CID) information element (IE)

For a wideband call, the CID IE portion of the SETUP message contains information to identify the channels within a single DS1 carrying the call. This is accomplished using a three-octet B-channel bitmap.

Message delivery: Calling Name Delivery

For PRI, existing services are modified to generate and dispatch appropriate Q.931 messages based on feature events. To provide this functionality, a messaging platform is developed based on an existing messaging architecture.

When the network switch receives no response to a TCAP query from the database, before the SETUP is sent to the user side, the Information Following

AX1227**CCM: NI-2 User Side Development—Phase II** (continued)

indication is used. This indication is sent in a Facility IE using ASN.1 encoding.

For more information and details, refer to the *Meridian SL-100 ISDN PRI Reference Manual*.

Message protocols: Nx64/Dialable Wideband

This feature uses the bearer capability and channel identification information elements in a SETUP message to implement DWS. (For more information, refer to the preceding description on message delivery: Nx64 Dialable Wideband.) This feature uses the Bellcore Standard (SR-3887, Issue 1, Revision 1) message protocol to accept the name information sent across the NI-2 PRI trunk.

Message protocols: Calling Name Delivery

This feature uses the name information in the facility information element of either the SETUP or FACILITY message sent over the NI-2 PRI trunk from the network side to the user side. (For more information, refer to the preceding description on message delivery: Calling Name Delivery.) This feature uses the Bellcore Standard (SR-3887, Issue 1, Revision 1) message protocol to accept the name information sent across the NI-2 PRI trunk.

Hardware requirements

CCM: NI-2 User Side Development—Phase II has no hardware requirements.

Limitations and restrictions

CCM: NI-2 User Side Development—Phase II has no limitations or restrictions.

Interactions

CCM: NI-2 User Side Development—Phase II has no functionality interactions.

Datafill

The following tables are modified for Nx64/Dialable Wideband:

- TRKGRP
- TRKSGRP
- OFCENG
- CARRMTC

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CCM: NI-2 User Side Development—Phase II (continued)

- LTCPSINV
- LTDEF

This feature uses the existing information in table OFCENG (to provide the flexibility of generating either one or two AMA records) for Calling Name Delivery. Refer to feature AF6628, ISDN Calling Name/Number Delivery for more information.

There is no special datafill required to enable Calling Name Delivery for the user side NI-2 trunk. However, the network side NI-2 trunk requires datafill to deliver the calling name. Refer to feature AF7209, ISDN PRI Calling Name Delivery for more information.

Table TRKGRP

Table TRKGRP defines the logical and physical characteristics of a trunk group. To allow wideband calls on a PRI trunk group, the selection sequence (SELSEQ) field in this table must be set to WIDEBAND as a valid option. When you select WIDEBAND for the SELSEQ field, three subfields are prompted.

The prompted SELSEQ subfields are:

- WBSELSEQWIDEBAND SELECTION SEQUENCE
- WBGRPINGWIDEBAND GROUPING
- WBSEARCHWIDEBAND SEARCH

Note: Datafilling SELSEQ as WIDEBAND can only be applied to new trunk groups. To provide DWS capability on existing trunk groups, delete the existing trunk groups from table TRKGRP and then re-add the trunk groups with the SELSEQ field datafilled as WIDEBAND.

Subfield WBSELSEQ

This subfield specifies whether the DS0s are chosen in ascending or descending order. It is recommended that the user datafill a trunk group as ASEQ (ascending) on the switch at one end of the trunk and as DSEQ (descending) on the switch at the other end of the trunk. This causes the two switches to search for available DS1s, from opposite ends of the set of DS1s on a trunk group, to avoid glare.

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CCM: NI-2 User Side Development—Phase II (continued)

Subfield WBGRPING

This subfield specifies the time slot arrangement types which may be used by call processing. (Time slot choices are FIXED, FLOATING, FLEXIBLE.) Refer to the preceding information on trunk selection.

Subfield WBSEARCH

This subfield specifies the search method used to find a group of timeslots. (The search method choices are BESTFIT and FIRSTFIT.)

The descriptions for BESTFIT and FIRSTFIT follow.

- **BESTFIT**—the bestfit algorithm minimizes fragmentation by allowing the largest groups of contiguous channels to remain unused and thus available for large bandwidth calls. It is recommended that bestfit only be used on one-way trunks when resources are limited.
- **FIRSTFIT**—this simply selects the first available N channels. Firstfit helps to avoid glare. Glare is the blocking of a call by the simultaneous seizure of a facility at both ends of the call (for example, two switches simultaneously select the same trunk for different calls).

Refer to the following example.

Example datafill for table TRKGRP

GRPKEY GRPINFO	
PRIFIX0	PRA 0 NPDGP NCIT WIDEBAND DSEQ FIXED FIRSTFIR N (NETDWS 20) \$\$
PRIFLT0	PRA 0 NPDGP NCIT WIDEBAND DSEQ FLOATING FIRSTFIT N (NETDWS 21) \$\$
PRIFLX0	PRA 0 NPDGP NCIT WIDEBAND ASEQ FLEXIBLE FIRSTFIT N (NETDWS 22) \$\$

Table TRKSGRP

For wideband PRI trunks, the field BCHGLARE indentifies whether the trunk is going to stand or yield in a glare situation. The values for this field are YIELD or STAND. This field should not be datafilled the same value on both ends of a PRI trunk.

Refer to the following example.

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Example datafill for table TRKSGRP

```
RPKEY CARDCODE SGRPVAR SGRPVAR
```

```
PRIFIX0 0 DS1SIG ISDN 15 15 UNISPEC20 2 N YIELD USER PT_PT  
USER N UNEQ 160 N DEFAULT NTCI 2 2 24 64K HDLC $
```

```
PRIFLT0 0 DS1SIG ISDN 15 15 UNISPEC20 2 N YIELD USER PT_PT  
USER N UNEQ160 N DEFAULT NTCI 2 5 24 64K HDLC $
```

```
PRIFLX0 0 DS1SIG ISDN 15 15 UNISPEC20 2 N STAND USER PT_PT  
USER N UNEQ 160 N DEFAULT DTCI 2 0 24 64K HDLC $
```

Table OFCENG

A switch can be configured to define the maximum number of simultaneous wideband calls allowed by using the office parameter, **MAX_NUM_WIDEBAND_CALLS**. This parameter has a range of 0 to 4096. The default value is zero. Data store needed for wideband calls is allocated by setting this value to a non-zero number. This parameter allocates two wideband extension blocks for each call.

Table CARRMTC

In table CARRMTC, an entry for the DTCI associated with wideband must have the field **ZERO_LOGIC** set to B8ZS, otherwise wideband calls will not operate properly. The recommended datafill for the DTCI is DTCI WIDEBAND . . . ESF B8ZS. . . .

Table LTCPSINV

Once an entry in table CARRMTC has been datafilled, changes must be made to table LTCPSINV for the DTCI that will carry wideband traffic. Each span that will host a wideband trunk must be datafilled with the corresponding entry from table CARRMTC. The following figure illustrates spans 3 through 12 as those that will host wideband trunks.

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CCM: NI-2 User Side Development—Phase II (continued)

Sample figure spans 3 through 12 as wideband

(0 DS1PRA DEFAULT N 0 NIL)	(1 DS1PRA DEFAULT N 0 NIL)
(2 DS1PRA DEFAULT N 0 NIL)	(3 DS1PRA WIDEBAND N 0 NIL)
(4 DS1PRA WIDEBAND N 0 NIL)	(5 DS1PRA WIDEBAND N 0 NIL)
(6 DS1PRA WIDEBAND N 0 NIL)	(7 DS1PRA WIDEBAND N 0 NIL)
(8 DS1PRA WIDEBAND N 0 NIL)	(9 DS1PRA WIDEBAND N 0 NIL)
(10 DS1PRA WIDEBAND N 0 NIL)	(11 DS1PRA WIDEBAND N 0 NIL)
(12 DS1PRA WIDEBAND N 0 NIL)	(13 DS1PRA DEFAULT N 0 NIL)
(14 DS1PRA DEFAULT N 0 NIL)	(15 DS1PRA DEFAULT N 0 NIL)
(16 DS1PRA DEFAULT N 0 NIL)	(17 DS1PRA DEFAULT N 0 NIL)
(18 DS1PRA DEFAULT N 0 NIL)	(19 DS1PRA DEFAULT N 0 NIL)

Table LTDEF

Table LTDEF defines the variant for the PRI trunk. Variant NIPRI with version NI2v1 must be used to define an NI-2 PRI trunk. Refer to the following example.

Example datafill for table LTDEF

LTKEY	LTAP	CLASSREF
NETDWS	20	B PRA 100 100 49 50 NIPRI NI2V1 NIL (NOPMD) \$
NETDWS	21	B PRA 100 100 49 50 NIPRI NI2V1 NIL (NOPMD) \$
NETDWS	22	B PRA 100 100 49 50 NIPRI NI2V1 NIL (NOPMD) \$

Service orders

CCM: NI-2 User Side Development—Phase II does not affect SERVORD.

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CCM: NI-2 User Side Development—Phase II (end)

Operational measurements

CCM: NI-2 User Side Development—Phase II does not affect operational measurements.

Logs

CCM: NI-2 User Side Development—Phase II does not affect logs. Refer to feature AF7218, PRI Dialable Wideband Service, for more information on logs associated with Nx64/Dialable Wideband NI-2 PRI services.

Refer to feature AF7209, ISDN PRI Calling Name Delivery, for more information on logs associated with Calling Name Delivery.

User interface

CCM: NI-2 User Side Development—Phase II does not change the user interface.

Billing

CCM: NI-2 User Side Development—Phase II does not affect billing.

AX1228

CCM: Name Display Character Extension

Functionality name

CCM: Name Display Character Extension

Description

This feature gives the user the option of displaying up to 24 characters in the name field on the displays of integrated voice and data (IVD) and Meridian business set (MBS) phones. This option only applies if the phones are physically capable of handling the name size increase.

This feature does not replace the existing 15-character name feature, but is an added option. The option places the 24 character name on the top line of the phone set display and the second line displays the DN, followed by the timer.

Accompanying feature

This feature works in conjunction with feature AX1240, MSL: Name Display Character Extension.

Hardware requirements

CCM: Name Display Character Extension is compatible with the following IVD and MBS sets:

- M2006
- M2008
- M2016S
- M2216A
- M2216B
- M2616
- M2616CT
- M5208
- M5209
- M5212
- M5216
- M5312
- M5316

AX1228

CCM: Name Display Character Extension (end)

Limitations and restrictions

The following limitations and restrictions apply to CCM: Name Display Character Extension:

- only MBS and IVD phone sets are supported
- the 24-character name display is not supported in a non-PBX environment (for example, across the network)

Interactions

Refer to feature AX1240, MSL: Name Display Character Extension.

Datafill

Refer to feature AX1240, MSL: Name Display Character Extension.

Service orders

CCM: Name Display Character Extension adds an option in SERVORD called Name24. The user chooses the Name24 option to make the phone set display up to 24 characters.

Operational measurements

CCM: Name Display Character Extension does not affect operational measurements.

Logs

CCM: Name Display Character Extension does not affect logs.

User interface

CCM: Name Display Character Extension does not change the user interface.

Billing

CCM: Name Display Character Extension does not affect billing.

AX1232

TL: Virtual Office Worker

Functionality name

TL: Virtual Office Worker

Description

The Virtual Office Worker (VOW) feature allows telecommuters (without dedicated physical phone sets) to access their dedicated directory number (DN) and associated features and options. Access is gained by logging into their dedicated DN from any predesignated group of phone sets.

A VOW is an individual who periodically visits an enterprise office location but lacks dedicated office space. VOWs typically retain various services including a dedicated DN, voice mail, departmental billing, and features specific to their set configuration. VOWs often reside in temporary cubicles or shared workspaces when visiting the office. This feature gives them access to the features and options associated with their DN.

Accompanying features

This feature works in conjunction with the following features:

- AX1233, CCM: Virtual Office Worker
- AX1236, MSL: Virtual Office Worker

Hardware requirements

TL: Virtual Office Worker has no hardware requirements.

Limitations and restrictions

Refer to feature AX1236, MSL: Virtual Office Worker.

Interactions

Refer to feature AX1236, MSL: Virtual Office Worker.

Datafill

Refer to feature AX1236, MSL: Virtual Office Worker.

Service orders

Refer to feature AX1236, MSL: Virtual Office Worker.

Operational measurements

Refer to feature AX1236, MSL: Virtual Office Worker.

AX1232

TL: Virtual Office Worker (end)

Logs

Refer to feature AX1236, MSL: Virtual Office Worker.

User interface

Refer to feature AX1236, MSL: Virtual Office Worker.

Billing

TL: Virtual Office Worker does not affect billing. However, the DN against which calls from a predesignated VOW set are billed will change depending on whether a VOW user is logged in or not. Refer to feature AX1236, MSL: Virtual Office Worker.

AX1233
CCM: Virtual Office Worker

Functionality name

CCM: Virtual Office Worker

Description

The Virtual Office Worker (VOW) feature allows telecommuters (without dedicated physical phone sets) access to their dedicated directory number (DN) and associated features and options. Access is gained by logging into their dedicated DN from any predesignated group of phone sets.

A VOW is an individual who periodically visits an enterprise office location but lacks dedicated office space. VOWs typically retain various services including a dedicated DN, voice mail, departmental billing, and features specific to their set configuration. VOWs often reside in temporary cubicles or shared workspaces when visiting the office. This feature gives them access to the features and options associated with their DN.

Accompanying features

This feature works in conjunction with the following features:

- AX1232, TL: Virtual Office Worker
- AX1236, MSL: Virtual Office Worker

Hardware requirements

CCM: Virtual Office Worker has no hardware requirements.

Limitations and restrictions

Refer to feature AX1236, MSL: Virtual Office Worker.

Interactions

Refer to feature AX1236, MSL: Virtual Office Worker.

Datafill

Refer to feature AX1236, MSL: Virtual Office Worker.

Service orders

Refer to feature AX1236, MSL: Virtual Office Worker.

Operational measurements

Refer to feature AX1236, MSL: Virtual Office Worker.

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CCM: Virtual Office Worker (end)

Logs

Refer to feature AX1236, MSL: Virtual Office Worker.

User interface

Refer to feature AX1236, MSL: Virtual Office Worker.

Billing

CCM: Virtual Office Worker does not affect billing. However, the DN against which calls from a predesignated VOW set are billed will change depending on whether a VOW user is logged in or not. Refer to feature AX1236, MSL: Virtual Office Worker.

AX1234**CCM: Authcode Enhancements**

Functionality name

CCM: Authcode Enhancements

Description

This feature is an authorization code (Authcode) enforcement option for existing Authcode functionality. The enforcement option does not allow users to complete calls without a valid authorization code. This feature enforces validation of voluntary Authcodes on a customer group basis.

Authorization codes are used with two types of features:

- Authcode First
- Authcode Last

This feature enhances the Authcode First feature.

Authcode First

Authcode First (voluntary Authcode) is activated by entering a feature access code associated with Authcode. The user is prompted for more digits and enters an authorization code. If it is valid, the network class of service (NCOS) associated with that Authcode will override the NCOS of the set. The user then obtains dialing privileges associated with the NCOS assigned to that authorization code. Before this feature, if this Authcode was invalid, it was ignored and the call continued using the NCOS associated with the set.

Authcode Last

Authcode Last is activated when the number dialed is recognized as requiring an authorization code. The Authcode is then entered to complete the call. If this Authcode is invalid, the call is sent to a treatment specified in the Authcode Last datafill. The Authcode Enhancements feature has no impact on Authcode Last.

What happens with Authcode Enhancements

When a user enters an invalid authorization code when originating a call and the Authcode enforcement option is enabled, the call is sent to a treatment. An invalid Authcode is defined as containing the correct amount of digits but does not match those datafilled in table AUTHCDE. Invalid Authcodes also contain either excess or an insufficient amount of digits. If the enforcement option is not enabled, there is no change in call processing (it continues using the NCOS of the line).

AX1234

CCM: Authcode Enhancements (continued)

The Authcode enforcement option (AUTHENF) uses table CUSTHEAD. When the AUTHENF option is enabled for a customer group, the user is prompted to enter the type of treatment the call receives in the event of an invalid authorization code entry. The treatment specified is of type EXTENDED_TREATMENT. This treatment specification is similar to the one used in Authcode Last. See limitations and restrictions.

When a user activates the Authcode First feature by entering its feature access code and enters an invalid authorization code, the datafill of this option determines if the call proceeds. If this option is enabled, the call is routed to the specified treatment.

Example authorization codes

Authorization codes can be combined with security digits and account codes. If security digits are associated with an Authcode, the format for dialing looks like the following example.

access code {dial tone} + authcode + security digits {dial tone} + DN

If account codes are combined with Authcodes (that is, datafilled as such in table CUSTHEAD), the format for dialing looks like the following example.

access code {dial tone} + authcode + account code {dial tone} + DN

The three codes can also be combined when dialing as shown in the following example.

access code {dial tone} + authcode + security digits + account code {dial tone} + DN

In the preceding scenarios, Authcode Enhancements takes effect in the event of an invalid Authcode, security code, or incorrect amount of code digits.

AX1234**CCM: Authcode Enhancements** (continued)

If the Authcodes are not combined with account codes the format looks like the following example.

**access code {dial tone} + authcode {dial tone} + DN {dial tone}
+ account code**

In the preceding scenario, Authcode Enhancements enforces the validation of the Authcode and its security digits (if applicable). The account code is validated for the correct amount of digits, if there are too few, the call is sent to treatment. Otherwise, the call is allowed. This validation is a function of Account Code Last, and therefore, is not changed by the AUTHENF option.

Note 1: Datafilling the AUTH option in table CUSTHEAD and setting the COMB field to Y prohibits authorization codes, which do not require account codes, in table AUTHCODE from working properly. This is because an account code is always expected and when no account code is dialed, the authcode is considered invalid.

Note 2: The SECRECY field of the Authcode option (AUTH) in table CUSTHEAD indicates if a pound sign (#) has to be dialed after an authorization code. If this field is set to Y, a pound sign is not needed upon completion of dialing the Authcode or the security digits, or both, combined with an account code.

Hardware requirements

CCM: Authcode Enhancements has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to CCM: Authcode Enhancements:

- AUTHENF must be datafilled in table CUSTHEAD with a specific treatment.
- supports only Authcode First and inherits that feature's limitations and restrictions
- This feature adds treatment specification so that calls may be properly routed in the event of an invalid authorization code. This treatment must be added to table CUSTHEAD once the option is present.
- To avoid translation errors, this treatment (EXTENDED_TREATMENT) must be present in subtable OFFTREAT in table TMTCNTL. If the treatment does not already exist in table OFFTREAT, it must be added.

AX1234

CCM: Authcode Enhancements (continued)

To add the treatment to table OFFTREAT, select the following:

- LOG = Y
- FSTRTSEL = T
- EXTRTEID = OFRT (with a valid index into table OFRT)

Interactions

The following paragraphs describe the interactions between CCM: Authcode Enhancements and other functionalities.

This feature applies to the three authorization types:

- System-Wide Authorization (SW) codes
- Super Authorization Codes (SUPAC)
- Station-Specific Authorization Codes (SSAC)

SW authcodes

SW Authcodes allow access to telephone privileges from phones in different areas, except those with SSAC assigned to them.

SUPAC authcodes

SUPAC Authcodes allow access privileges from any station and overrides the SSAC assignment.

SSAC authcodes

SSAC Authcodes are valid only when accessed from the set to which they are assigned. SSAC Authcodes are assigned through SERVORD and connect the authorization code to a line equipment number (LEN). Any attempt to use an Authcode labeled as SSAC in table AUTHCDE on a set other than the one to which it is assigned is considered to be invalid and will be treated as such by this feature. Likewise, any attempt to use an authorization code other than the datafilled Authcode on a set with SSAC will have the same outcome. This datafilled Authcode is assigned to the set when SSAC is added using SERVORD.

DISA and NSS

Direct inward system access (DISA) and network switching system (NSS) use their own Authcode validation process and are not affected by this feature.

AX1234**CCM: Authcode Enhancements (end)**

Datafill

Four tables control the Authcode First feature.

- table IBNXLA—lists the access code with its customer translator name
- table CUSTHEAD—assigns an Authcode partition name to a customer group
- table AUTHPART—defines the properties of that partition
- table AUTHCDE—lists the Authcodes available for assignment

Table CUSTHEAD

CCM: Authcode Enhancements only affects table CUSTHEAD.

AUTHENF is a new option in table CUSTHEAD. If this option is selected, the user is prompted to enter the type of treatment the call is to receive in the event of an invalid Authcode. The treatment to specify is AUTHTRMT.

Service orders

CCM: Authcode Enhancements does not affect SERVORD.

Operational measurements

CCM: Authcode Enhancements does not affect operational measurements.

Logs

CCM: Authcode Enhancements does not affect logs.

User interface

CCM: Authcode Enhancements does not change the user interface.

Billing

CCM: Authcode Enhancements does not affect billing.

AX1236

MSL: Virtual Office Worker

Functionality name

MSL: Virtual Office Worker

Description

The Virtual Office Worker (VOW) feature allows employees who work outside of the enterprise location and are without dedicated physical phone sets access to their dedicated directory number (DN) and associated features and options when they visit their workplace location. Access is gained by logging into their dedicated DN from any set in a predesignated group of phone sets. Supported are Meridian business set (MBS), integrated voice and data (IVD), and integrated business network (IBN) sets.

A VOW is an individual who periodically visits an enterprise office location but lacks dedicated office space. VOWs typically retain various services including a dedicated DN, voice mail, departmental billing, and features specific to their set configuration. VOWs often reside in temporary cubicles or shared workspaces when visiting the office. This feature gives them access to the features and options associated with their DN.

In general, there is not a one-to-one correspondence between VOWs and the physical sets used to access the dedicated DNs and features. For example, there may be 15 predesignated sets for a particular customer group, allowing 15 VOWs to access their dedicated DN and features at a time. If all VOWs in this customer group only require access to their dedicated DN and features one day a week during a five day work week, then with the proper coordination, these 15 physical sets could support up to 60 VOWs each week.

Accompanying features

This feature works in conjunction with the following features:

- AX1232, TL: Virtual Office Worker
- AX1233, CCM: Virtual Office Worker

AX1236**MSL: Virtual Office Worker** (continued)**VOW setup**

The following must be datafilled for each customer group that supports the VOW feature.

- In table DNROUTE, at least one VOWDN must be datafilled. A VOWDN is required for each set in the customer group to be used for VOW functionality.
- In table CUSTSTN, feature VOWDN must be datafilled. The CUSTSTN tuple contains the following:
 - NCOS and SUBGRP values for translations purposes on the predesignated VOW sets when no VOW is logged in
 - a value specifying whether the VOW authorization code is required within the associated customer group during use of the VOWIN feature access code
 - a value specifying whether the personal system wide (SW) authorization code is required within the associated customer group during use of the VOWIN feature access code
 - a value specifying whether the associated customer group is to be audited. If so, a value specifying the hour of the day the audit is to occur must be specified.
 - a value specifying whether VOW interacts with call forwarding. If it does, enabling call forwarding for a VOW when he logs out and disabling call forwarding for a VOW when he logs in must be specified.
 - the length of the VOW personal ID code (referred to as passcode from now on)
 - the line class code of the sets which use the VOW feature
- In table IBNXLA, feature translators VOWIN, VOWOUT, VOWPCC, and VOWROUT must be datafilled.
- In table AUTHCDE, VOW and SW authorization codes must be datafilled. These codes are used for the VOWIN feature access code (if the authorization codes are enabled through the VOWDN tuple in table CUSTSTN).

Within the customer groups that support the VOW feature, a VOW's dedicated DN and features must be configured on a predesignated phone set. On this set, the line option VOW must be assigned in service orders (SERVORD). Assignment of the VOW line option includes the specification of the initial passcode for the associated VOW. Once assigned, the VOW is logged into the dedicated DN and has access to features. In other words, when initially

AX1236

MSL: Virtual Office Worker (continued)

assigned, the VOW's dedicated DN and features are still associated with the physical set on which they were configured prior to the assignment of the VOW line option. This is true until the VOW logs out, performs a remote logout, or is logged out by the VOW audit.

All predesignated sets used by VOWs need to have the VOWDN line option assigned within the customer groups that support the VOW feature.

MSL-100 switch personnel can log a VOW in or out of his dedicated DN and features by using CKLN/CLN SERVORD commands. In these scenarios, the CKLN/CLN commands operate normally but a VOW line equipment number (LEN) is provided as either the source or target LEN of the change LEN command.

VOW login

A VOW performs the following steps to log in.

1. Go off hook
2. Upon receipt of dial tone, dial the VOWIN feature access code that is datafilled in table IBNXLA (for example, *80) for the specific customer group and NCOS.
3. Upon receipt of dial tone, dial the VOW authorization code that is datafilled in table AUTHCDE (for example, 7654321) for the specific customer group and NCOS. The length of this authorization code is specified in table AUTHCDE. If a mistake is made when entering the VOW authorization code, press the '*' key to restart the collection of the code.

Note: This step is required only if the use of the VOW authorization code is enabled through the VOWDN tuple in table CUSTSTN for the specific customer group.

4. Upon receipt of dial tone, dial the personal authorization code that is datafilled in table AUTHCDE (for example, 1234567) for the specific customer group and NCOS. The length of this authorization code is specified in table AUTHCDE. If a mistake is made when entering the code, press the '*' key to restart the collection of the code.

Note: This step is required only if the use of the SW authorization code is enabled through the VOWDN tuple in table CUSTSTN for the specific customer group.

AX1236**MSL: Virtual Office Worker** (continued)

5. Upon receipt of dial tone, dial the primary directory number (PDN) for the VOW set data for which the passcode is being modified (for example, 2149975005). If a mistake is made when entering the PDN, press the '*' key to restart collection of the PDN.
6. Upon receipt of dial tone, dial the passcode unique to that VOW (for example, 9975056449). If a mistake is made when entering the passcode, press the '*' key to restart collection of the passcode.

At this point, logs are generated and operational measurements (OM) are pegged to indicate a successful login. If login is unsuccessful, OM's will be pegged to indicate that an error occurred during login and the set will return to an idle state.

Upon successful login, the VOW is able to make and receive calls using the dedicated DN. That DN is then associated with the VOW set on which the login took place. In addition, the features previously assigned to the dedicated DN operate normally and retain settings from the previous logout.

Once logged in, the VOW's dedicated DN and associated data are associated with a physical LEN, as shown in the following figure.

AX1236**MSL: Virtual Office Worker** (continued)

QLEN output at login

```
>qlen 9975121
-----
LEN:   HOST 0 0 0 1
TYPE:  SINGLE PARTY LINE
SNPA:  214
DIRECTORY NUMBER:      9975121
LINE CLASS CODE:  M2016S
CUSTGRP:      BNRRCH SUBGRP: 0 NCOS: 0 RING: Y
CARDCODE: 8D02AB GND: N PADGRP: NPDGP BNV: NL MNO: Y
PM NODE NUMBER   :   55
PM TERMINAL NUMBER :   33
OPTIONS:
CWI VOW
CFD F 5122 I 1 2 CWT Y Y N 1 2

  KEY      DN
  ----
  1      DN      9975121

  KEY      FEATURE
  ----
  1      CFD F      5000      I 1 2
  4      CWT Y Y N 1 2
-----
```

VOW logout

A VOW performs the following steps to log out.

1. Go off hook.
2. Upon receipt of dial tone, dial the VOWOUT feature access code that is datafilled in table IBNXLA (for example, *81).

At this point, logs are generated and OMs are pegged to indicate a successful logout. If the logout is unsuccessful, OMs will be pegged to indicate that an error occurred during a logout attempt and the set will return to an idle state.

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If successful, the VOW is logged out. Calls can originate from the set on which the logout took place, but calls cannot terminate to that set. All data, including the dedicated DN and features associated with the VOW that just logged out, will be completely disassociated with the set.

Once logged out, the VOW's dedicated DN and associated data are associated with a physical LEN. Instead, it is associated with a VOW logical terminal, as shown in the following figure. Similarly, when logged out, the predesignated VOW set returns to the VOWDN line format.

QLEN output at logout

```
>qlen 9975121
-----
LEN:    VOW 1 1
TYPE:   SINGLE PARTY LINE
SNPA:   214
DIRECTORY NUMBER:      9975121
LINE CLASS CODE:   M2016S
CUSTGRP:           BNRRCH SUBGRP: 0 NCOS: 0 RING: Y
CARDCODE:NOT APPLICABLE GND: N  PADGRP: NPDGP  BNV: NL MNO: N
OPTIONS:
CWI VOW
CFD F 5122 I 1 2 CWT Y Y N 1 2

  KEY      DN
  ----      -
    1      DN          9975121

  KEY      FEATURE
  ----      -
    1      CFD F          5000      I 1 2
    4      CWT Y Y N 1 2
-----
```

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QLEN output - VOWDN line format

```
>qlen HOST 0 0 0 1
-----
LEN:    HOST 0 0 0 1
TYPE:   VIRTUAL DIRECTORY NUMBER
SNPA:   214
DIRECTORY NUMBER:      9975121
LINE CLASS CODE:      M2016S
CUSTGRP:               BNRRCH SUBGRP: 0 NCOS: 0 RING: Y
CARDCODE: 8D02AB GND: N PADGRP: NPDGP BNV: NL MNO: Y
PM NODE NUMBER       : 55
PM TERMINAL NUMBER   : 33
OPTIONS:
VOWDN $
      KEY      DN
      ----
      1        DN          9975900

      KEY      FEATURE
      ----
      NONE
-----
```

VOW passcode change

On a set within the same customer group on the same switch as the VOW's set data, a VOW can perform a passcode change as follows:

1. Go off hook.
2. Upon receipt of dial tone, dial the VOWPCC feature access code that is datafilled in table IBNXL A (for example, *82) for the specific customer group.
3. Upon receipt of dial tone, dial the PDN of the VOW set for which the passcode is being modified (for example, 2149975005). If a mistake is made when entering the PDN, press the '*' key to restart collection of the PDN.
4. Upon receipt of dial tone, dial the current passcode unique to that VOW (for example, 99750564496). The length of this passcode is specified in

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table CUSTSTN in the VOWDN tuple for the specific customer group. If a mistake is made when entering the current passcode, press the `*' key to restart collection of the current passcode.

5. Upon receipt of dial tone, dial the new passcode for that VOW (for example, 99750569448). The length of this passcode is specified in table CUSTSTN in the VOWDN tuple for the specific customer group. If a mistake is made when entering the new passcode, press the `*' key to restart collection of the new passcode.
6. Upon receipt of dial tone, redial to confirm the new passcode for that VOW (for example, 99750569448). The length of this passcode is specified in table CUSTSTN in the VOWDN tuple for the specific customer group. If a mistake is made when re-entering the new passcode, press the `*' key to restart collection for the re-entry of the new passcode.

If the first new passcode does not match the second new passcode (the confirmation fails), then the VOW's passcode did not change.

Whether successful or not, OMs are pegged to record the result of the passcode change attempt.

VOW remote logout

On a set within the same customer group on the same switch as the VOW's set data, a VOW can perform a remote logout as follows;

1. Go off hook.
2. Upon receipt of dial tone, dial the VOWROUT feature access code that is datafilled in table IBNXLA (for example, *83) for the specific customer group.
3. Upon receipt of dial tone, dial the PDN of the VOW set which is being remotely logged out (for example, 2149975005). If a mistake is made when entering the PDN, press the `*' key to restart collection of the PDN.
4. Upon receipt of dial tone, dial the current passcode for that VOW (for example, 99750564496). The length of this passcode is specified in table CUSTSTN in the VOWDN tuple for the specific customer group. If a mistake is made when entering the current passcode, press the `*' key to restart collection of the current passcode.

If the VOW was logged in, this forces a logout from a remote station. At this point, logs are generated and OMs are pegged to indicate a successful remote logout. If the remote logout was unsuccessful, OMs will be pegged to indicate

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that an error occurred during the remote logout and the set will return to an idle state.

If the remote logout was successful, the VOW set data is modified (see the preceding description, VOW logout).

VOW audit process

In the VOWDN tuple in table CUSTSTN, specify that an audit be executed every 24 hours against the VOWs in a specific customer group. If specified, the hour at which the audit executes is entered. If the audit process is enabled, it will execute at the specified hour every day and will log out those VOWs who are still logged in. Logs will be generated and OMs will be pegged to record any actions taken by the audit.

If the set at which a VOW is logged in is not in an idle state when the audit executes, then that VOW will not be logged out by the audit. Instead, at the next hour, the audit will check the set again. If the VOW is still logged in but is idle, the audit will log the VOW out. If still logged in and the set is not idle, the audit will attempt to log out the VOW at the next hour. This repeats until the VOW is logged out, either manually or through the audit.

VOWs that are logged out through the audit process can log back in just as if they had logged themselves out.

Table VOWINV and CI command VOWCI

When sets and DNs are assigned the VOW and VOWDN line options, table VOWINV is automatically datafilled with information regarding the sets involved with the VOW feature. You cannot add or delete tuples from this table through the table editor. The only field that switch personnel can modify is the VOWPID field. This field contains a VOW's passcode. Use this field to reset a VOW's passcode.

The VOWCI command provides alternate views of the data present in table VOWINV. For example, this command can be used to list details on

- the physical sets from which VOWs can log in
- the VOWs currently logged in or logged out
- data for each customer group

Refer to the datafill and user interface sections for more information on table VOWINV and the CI command, VOWCI.

AX1236**MSL: Virtual Office Worker** (continued)**Hardware requirements**

MSL: Virtual Office Worker has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to MSL: Virtual Office Worker:

- The VOWDN line option is compatible with line options such as SETMODEL, M0200, and NAME.
- The VOW line option is not compatible with Multiple Appearance Directory Number (MADN), Automatic Call Distribution (ACD), or Hunt groups. Therefore, it is not compatible with the MADN, ACD, and the various hunt-related line options. It is also not compatible with the network facility access (NFA) line option.
- Up to 20,500 VOWs can exist within a single MSL-100 switch, if all VOWs require only a single LEN. Within a customer group, there is no limitation on the number of VOWs, except for the switch maximum. This limit facilitates having more VOWs (that is, VOW set data with the VOW line option assigned) than VOWDN sets (that is, physical sets with the VOWDN line option assigned).
- IVD sets can be configured with a second (mate) LEN. If a VOW's dedicated DN and features are associated with such a set, then that VOW will require two VOW LENs. This reduces the maximum number of VOWs.
- Within a customer group, all VOW's dedicated DNs and features must be associated with the same type of set. The predesignated physical sets from which VOWs will log in must also be of that same type.
- The calls that can be originated from a set with VOWDN assigned are determined and restricted by the translations set up against the corresponding customer group and the NCOS and SUBGRP values in the VOWDN tuple in table CUSTSTN. For example, translations could limit these VOWDN sets to only make E911 calls, E911 and local calls, and E911, local and long distance calls.
- One DN is required for each set in a customer group that supports the VOW feature. The maximum number of VOWDN instances is 4095, which is shared by all customer groups in the system.
- Once the VOW line option is assigned, the associated set can be updated using SERVORD (for example, commands ADO and NEW) when the associated VOW is logged in. If a VOW is logged out, his set data is associated with a VOW logical terminal number instead of a physical LEN.

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Further updating by MSL-100 switch personnel must be performed as follows:

- Use the appropriate CKLN/CLN SERVORD command to move the VOW's set data from a VOW logical terminal to a physical LEN. This logs the VOW in to the specific physical LEN (see note).

Note: The audit time, if activated for the associated customer group, should be considered when performing this action. If these actions are executed when the VOW audit runs for the associated customer group, the VOW user is effectively logged out by the audit process.

- Perform the required updating using SERVORD.
- Use the appropriate CKLN/CLN SERVORD command to move the VOW's set data from the physical LEN back to a VOW logical terminal. This logs the VOW out of the previously specified LEN.
- A VOW login can only occur from a set with VOWDN assigned and which is in the same customer group as the VOW's set data for the VOW who is attempting to log in.
- Access to the VOW feature (using VOWIN, VOWOUT, VOWROUT, and VOWPCC) is not allowed during a one night process (ONP). This is because of the number of tables that are modified when moving VOW set data from a physical LEN to a virtual LEN or moving VOW set data from a virtual LEN to a physical LEN.

Interactions

The following paragraphs describe the interactions between MSL: Virtual Office Worker and other functionalities.

Configuring a VOW line option to a set results in the creation of a tuple in table VOWINV, as well as the allocation of a virtual VOW LEN for use by the set in which the VOW line option is assigned. If the set is an IVD set with a mate LEN present, a second virtual VOW LEN will be allocated for the mate LEN.

The removal of the VOW line option from a set results in the deletion of the corresponding tuple in table VOWINV, and the deallocation of the virtual LEN(s).

Once logged in, the existing features associated with a VOW's dedicated DN operate as if the VOW's set was originally configured for the set from which the user logged in. Features that operate without change are billing, message

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waiting indication, calling and caller name and number display, and originating and receiving calls.

Once logged out, the options associated with the VOW dedicated DN, such as call forwarding, will operate as if the VOW was actually logged in (assuming that such features were active at the time the VOW logged out).

If the VOWDN tuple in table CUSTSTN enables the VOW feature to interact with call forwarding, then when a VOW logs out, his call forwarding will be activated. Similarly, when a VOW logs in, his call forwarding will be deactivated. This interaction applies only to the basic call forwarding types Call Forwarding Universal (CFU), Call Forward Fixed (CFF), and Call Forwarding Internal (CFI). Call Forward Per Key (CFK), Call Forward Busy (CFB), and Call Forward Don't Answer (CFD) are not supported with the call forwarding interaction for this feature.

When logged out, the VOW data is moved from a physical LEN to a virtual LEN. When this occurs, the DN's on a VOW's set data which were moved appear to the system to be in a busy (offline) state. This means calls to logged out VOW DN's will not ring, but instead, will receive busy tone.

With normal call forwarding, the active CFU, CFF, CFI, and CFK call forwarding types take precedence over the CFB and CFD call forwarding types on a logged out VOW's set data.

The following table outlines how calls to a logged out VOW's DN will forward using CFB and CFD.

CFB/CFD interactions with logged out VOWs (Sheet 1 of 2)

	CFB active	CFB inactive	CFB not provisioned
If CFD active	Calls will forward using CFD	Calls will forward using CFD	Calls will not forward using either CFB or CFD

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CFB/CFD interactions with logged out VOWs (Sheet 2 of 2)

	CFB active	CFB inactive	CFB not provisioned
If CFD inactive	Calls will forward using CFB	Calls will not forward using either CFB or CFD	Calls will not forward using either CFB or CFD
If CFD is not provisioned	Calls will forward using either CFB	Calls will not forward using either CFB or CFD	Calls will not forward using either CFB or CFD

Datafill

This feature creates table VOWINV.

Other tables must be properly datafilled prior to using the VOW feature. These tables are

- table AUTHCDE
- table CUSTSTN
- table DNROUTE
- table IBNXLA

Service Orders (SERVORD) automatically datafills table DNINV.

This feature creates a new LEN format. A VOW virtual LEN or logical terminal is noted through type EXT_LEN with the following format.

VOW <VOW node number> <VOW terminal number>

VOW node number is a value from 1 to 10, and VOW terminal number is a value 1 to 2050. For example, VOW 2 955.

When a VOW user logs out, the set data is moved from the associated physical LEN to a virtual VOW LEN. This impacts every table which has a reference to the physical LEN.

When a VOW user logs in, the set data is moved from the associated virtual LEN to a physical LEN. This impacts every table which has a reference to the virtual LEN.

AX1236**MSL: Virtual Office Worker** (continued)**Table VOWINV**

This table stores data associated with the VOW feature. It contains the physical or virtual LENSs associated with a VOW's dedicated DN and associated data, the personal ID code, and the primary DN. When VOWs log in and out of their dedicated DNs, this table automatically updates to keep the information current. Table VOWINV also contains information identifying the physical sets which have the VOWDN line option assigned to them. The only field in this table that MSL-100 switch personnel can modify is the VOWPID field. Refer to the figure, Example datafill for table VOWINV.

VOWKEY is the table key and uniquely identifies a tuple through a customer group (CUSTGRP) and VOW_TUPLE_TYPE value (VOWTYPE). For example

- if a VOW_TUPLE_TYPE of VOW is specified, then VOWPDN, identifying the primary DN of the VOW, is also part of the VOWKEY.
- if a VOW_TUPLE_TYPE of VOWDN is specified, then VOWDNLEN, identifying a physical LEN for which the VOWDN option is assigned, is also part of VOWKEY.

The VOWDATA field contains the remaining data for the tuples. VOWTYPE within VOWDATA matches the value of VOWTYPE within VOWKEY.

If VOWTYPE within the VOWDATA field contains the VOW_TUPLE_TYPE VOWDN, the field VOWDN is present, identifying the DN associated with the corresponding VOWDN set.

If VOWTYPE within the VOWDATA field contains the VOW_TUPLE_TYPE VOW, then other fields are present in the tuple.

They are:

- VOWPID—provides the associated VOW passcode value
- VOWLEN—provides the preassigned virtual VOW LEN for use by the associated VOW user
- VOWMATE—provides the preassigned virtual VOW mate LEN for use by the associated VOW user
- LOGGEDIN—specifies whether the associated VOW user is logged in
- PHYSLEN—if LOGGEDIN is set to Y, this field provides the physical LEN that the VOW user is currently logged onto. If LOGGEDIN is set to

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N, the field provides the physical LEN the VOW user was previously logged into.

- **PHYSMATE**—if LOGGEDIN is set to Y, this field provides the physical mate LEN that the user is currently logged onto, if there is a mate. If LOGGEDIN is set to N, the field provides the previous physical mate LEN.

Example datafill for table VOWINV

VOWKEY VOWDATA

```
-----
BNRRCH VOWDN LCM1 00 1 09 31 VOWDN 214 997 5700
BNRRCH VOW 2149975134 VOW 839943 VOW 2 66 N N IPE0 0 0 2 3 N
BNRRTP VOWDN IPE0 00 0 00 12 VOWDN 919 657 7700
BNRRTP VOW 9196577665 VOW 5576643 VOW 4 644 Y VOW 4 645 Y DLM0 0 0 4 12 Y
DLM0 0 0 4 13
```

Table AUTHCDE

Table AUTHCDE has a new value available in field AUTHTYPE called VOW. Use the VOW value in this field to specify the tuple as a VOW authorization code. Refer to the following figure.

Example datafill for table AUTHCDE

AUTHPART AUTHCODE INFO

```
-----
BNRRCH 7654321 IBN 0 N $ VOW $
```

Table CUSTSTN

Table CUSTSTN has a new value available in fields OPTNAME and OPTION.

The new fields in table CUSTSTN are

- **NCOS**—specifies the network class of service to be associated with all physical sets that have the VOWDN line option assigned to them (value ranges from 0 to 511) in the specific customer group
- **SUBGRP**—specifies the subgroup associated with the physical sets that have the VOWDN line option assigned to them (value ranges from 0 to 7)

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- VOWAUTH—specifies whether the VOW authorization code is required for a VOW login
- SWAUTH—specifies whether the personal system wide authorization code is required for a VOW login
- AUDIT—specifies whether the VOW audit is to be executed (values are Y or N) in the specific customer group. If AUDIT is Y, then the HOUR field must be completed.
- HOUR—specifies the hour of the day to start the audit (values are 0 to 23, where 0 equals midnight/12:00 am and 12 equals noon/12:00 pm) for the specific customer group
- CFW—specifies whether call forwarding interactions with VOW logins and logouts are enabled (values are Y or N)
- PCCLLEN—specifies the length of the passcode values for VOWs (values are 4 to 10) in the specific customer group
- VOWLCC—specifies the line class code of the set within the customer group which is to use the VOW feature (that is, the set for which the VOWDN and VOW line options may be assigned)

Refer to the following figure.

Example datafill for table CUSTSTN

CUSTNAME	OPTNAME	OPTION
BNRRCH	VOWDN	VOWDN 0 0 Y Y Y 0 Y 7 PSET
BNRRTP	VOWDN	VOWDN 0 4 Y N N N 4 M2616

Table DNINV

Field FEATURE is modified within the FEAT result selector to allow a new FTRDN_CODE value of VOWDN. If VOWDN is present as the value of FEATURE, then the new field VOWDNIDX associates a unique index value to the VOWDN tuple and CUSTGRP of type CUSTOMER_GROUP represents the customer group associated with the tuple. Refer to the following figure.

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Example datafill for table DNINV

AREACODE	OFCCODE	STNCODE	DNRESULT
919	657	7293	FEAT VOWDN 23 BNR RTP

Table DNROUTE

In table DNROUTE, at least one unique DN must be allocated against each customer group that supports the VOW feature. The FEATURE field is modified within the FEAT result selector to allow a new FTRDN_CODE value of VOWDN. If VOWDN is present as the value of FEATURE, then the new field VOWDNIDX associates a unique index with the VOWDN tuple, and CUSTGRP of type CUSTOMER_GROUP represents the customer group associated with the tuple. Refer to the following figure.

Example datafill for table DNROUTE

AREACODE	OFCCODE	STNCODE	DNRESULT
919	657	7293	FEAT VOWDN 23 BNR RTP

Table IBNXLA

In table IBNXLA, four new values are made available for the FEATURE field. They are

- VOWIN—indicates the VOW login feature
- VOWOUT—indicates the VOW logout feature
- VOWPCC—indicates the VOW passcode change feature
- VOWROUT—indicates the VOW remote logout feature

Refer to the following figure.

AX1236**MSL: Virtual Office Worker** (continued)**Example datafill for table IBNXLA**

```

KEY   RESULT
-----
FRCH 30 FEAT N N VOWIN
FRCH 31 FEAT N N VOWOUT
FRCH 32 FEAT N N VOWPCC
FRCH 33 FEAT N N VOWROUT

```

Service orders

This feature introduces two line options called VOW and VOWDN. These line options are available on the sets described in the following table.

Phone sets compatible with the VOW and VOWDN line options

Set type	Line class code (LCC)
MBS	PSET, M5008, M5009, M5112, M5208, M5209 M5212, M5216, M5312, M5316
IVD	M2006, M2008, M2009, M2016S, M2018, M2112, M2216A, M2216B, M2317, M2616, M2616CT
IBN	IBN

The VOWDN line option applies to a set from which a VOW can log in. It is compatible with line options such as SETMODEL, M0200, and NAME. The reason for this is so calls to the shared VOWDN, datafilled in DNROUTE against the corresponding customer group, do not terminate when dialed.

Both the VOW and VOWDN line options must be assigned to the PDN of a keyset with a line format in table KSETLINE of DN, or to an IBN set with a line format in table IBNLINES of STN. VOW is incompatible with the MADN feature, the ACD feature, and attendant consoles.

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Operational measurements

MSL: Virtual Office Worker creates a new OM group, VOW. The OM registers are pegged in the following events.

- successful log in
- successful log in through CLN/CKLN
- successful log out
- successful log out through CLN/CKLN
- successful log out through audit process
- successful remote log out
- successful passcode change
- invalid log in attempt
- invalid log out attempt
- invalid remote log out attempt
- invalid CLN/CKLN log in attempt
- invalid CLN/CKLN log out attempt
- invalid audit log out
- invalid passcode change attempt

The VOW OM group contains the following registers.

- INPASS
- INFAIL
- OUTPASS
- OUTFAIL
- CINPASS
- CINFAIL
- COUTPASS
- COUTFAIL
- AUDPASS
- AUDFAIL
- PCCPASS
- PCCFAIL

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- ROUTPASS
- ROUTFAIL

Logs

Log type, VOW, is created for the VOW feature. This log type contains numerous reports.

Log reports are generated for the following events.

- successful log in
- successful log in through CLN/CKLN
- successful log out
- successful log out through CLN/CKLN
- successful passcode change
- successful remote log out
- successful log out through audit process
- unsuccessful log in
- unsuccessful log in through CLN/CKLN
- unsuccessful log out
- unsuccessful log out through CLN/CKLN
- unsuccessful remote log out
- unsuccessful audit log out

There are four log reports.

- VOW501
- VOW502
- VOW601
- VOW602

VOW501

This log report generates when a VOW access attempt passes (for example, login, logout, or passcode change). Refer to the following figure.

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VOW501 example

```
VOW501  JAN28 14:08:23  0007  INFO VOW ATTEMPT PASSED
        VOW USER    =  2149975055
        VOW LEN      =  IPE0 0 1 1 12
        ACTION       =  LOGIN
        METHOD        =  VOWIN
```

VOW502

This log report generates when a VOW access attempt fails (for example, login, logout, or passcode change). Refer to the following figure.

VOW502 example

```
VOW502  JAN28 14:08:23  0007  INFO VOW ATTEMPT FAILED
        VOW USER    =  2149975055
        VOW LEN      =  IPE0 0 1 1 12
        ACTION       =  LOGIN
        METHOD        =  VOWIN
```

VOW601

This log report generates when the VOW audit process completes. It contains the counts of the number of VOW users who were logged in when the audit began, the number of VOW users on which logouts were attempted by the audit, and success and failure counts for those attempts. Refer to the following figure.

AX1236**MSL: Virtual Office Worker** (continued)**VOW601 example**

```
VOW601  JAN28 14:08:23  0007  INFO VOW AUDIT COMPLETE
        CUSTOMER GROUP    =  BNRRCH
        LOGGED IN         =  23
        ATTEMPTED LOGOUTS =  21
        SUCCESSFUL LOGOUTS = 20
        FAILED LOGOUTS    =   1
```

VOW602

This log report generates when VOW processing finds some error and cannot continue processing. It contains a text message describing the error event. This log is followed by one of the VOW501, VOW502, or VOW601 logs. These logs provide information regarding the agents involved with the VOW processing that failed.

VOW602 example

```
VOW602  JAN28 14:08:23  0007  INFO VOW INFORMATION
        INFO:  Could not seize line to RTS
```

User interface

MSL: Virtual Office Worker creates a new CI command, VOWCI, to allow easy access to information about sets with the VOW feature.

There are five new VOWCI commands.

- VOWDNSETS
- VOWALL
- VOWIN

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- VOWOUT
- VOWCUST

VOWDNSETS

This command provides a formatted listing of all physical sets which have the VOWDN line option assigned to them. Included is the associated set type, the associated customer group, and the customer group specific information associated with the VOWDN sets. The customer group specific information includes VOWDN/VOW information from table DNROUTE/DNINV and the VOWDN information from table CUSTSTN.

A customer group can be specified to limit the output to a single customer group. If no customer group is specified, output will be provided for all applicable customer groups.

Command syntax

The following is the command syntax for the CI command, VOWDNSETS.

```
>VOWCIVOWCI:>Q VOWDNSETSCOMMAND VOWDNSETS: LIST VOW  
SETSCOMMAND VOWDNSETS:VOWSETS [<CUSTOMER_GROUP>]>
```

VOWALL

This command provides a formatted listing of all VOW user's DN's which have the VOW line option assigned. This listing includes the set type, the associated customer group, log in or log out status of the user, and the LEN (physical or virtual) with which the user's set data is currently associated.

A customer group can be specified to limit the output to a single customer group. If no customer group is specified, output will be provided for all applicable customer groups.

Command syntax

The following is the command syntax for the CI command, VOWALL.

```
>VOWCIVOWCI:>Q VOWALLCOMMAND VOWALL: LIST ALL VOW USERS (LOGGED  
IN OR LOGGED OUT)COMMAND VOWALL:VOWALL [<CUSTOMER_GROUP>]>
```

AX1236**MSL: Virtual Office Worker** (continued)**VOWIN**

This command provides a formatted listing of all VOW users's DNs which have the VOW line option assigned and which are also logged into their DNs. Included are the set type, the associated customer group, and the physical LEN with which the user's set data is currently associated.

A customer group can be specified to limit the output to a single customer group. If no customer group is specified, output will be provided for all applicable customer groups.

Command syntax

The following is the command syntax for the CI command, VOWIN.

```
>VOWCIVOWCI:>Q VOWINCOMMAND VOWIN: LIST ALL LOGGED IN VOW  
USERSCOMMAND VOWIN:VOWIN [<CUSTOMER_GROUP>]>
```

VOWOUT

This command provides a formatted listing of all VOW users's DNs which have the VOW line option assigned and which are also logged out of their DNs. Included are the set type, the associated customer group, and the virtual LEN with which the user's set data is currently associated.

A customer group can be specified to limit the output to a single customer group. If no customer group is specified, output will be provided for all applicable customer groups.

Command syntax

The following is the command syntax for the CI command, VOWOUT.

```
>VOWCIVOWCI:>Q VOWOUTCOMMAND VOWOUT: LIST ALL LOGGED OUT VOW  
USERSCOMMAND VOWOUT:VOWOUT [<CUSTOMER_GROUP>]>
```

VOWCUST

This command provides the same information as VOWSETS and VOWALL.

A customer group can be specified to limit the output to a single customer group. If no customer group is specified, output will be provided for all applicable customer groups.

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Command syntax

The following is the command syntax for the CI command, VOWCUST.

```
>VOWCIVOWCI:>Q VOWCUSTCOMMAND VOWCUST: LIST VOW CUSTOMER GROUP  
INFORMATIONCOMMAND VOWCUST:VOWCUST [<CUSTOMER_GROUP>]>
```

Error messages

The following error messages appear when one of the preceding VOWCI commands was used with incorrect customer group information.

- DNROUTE VOWDN: UnassignedNo VOWDN sets exist within this customer group.
- No VOW sets exist within this customer group.
- No logged-in VOW sets exist within this customer group.
- No logged-out VOW sets exist within this customer group.
- DNROUTE VOWDN: UnassignedNo VOWDN sets exist within this customer group.
- No VOW sets exist within this customer group

Recovery procedure

The preceding error message displays on the MAP workstation. To correct the error message, input the correct customer group information when using the VOWCI command (for example, VOWOUT BNRRCH).

Billing

MSL: Virtual Office Worker does not affect billing. The existing billing functionality handles the billing of calls from the temporary LEN to the corresponding virtual DN.

AX1238**MSL: NT3X68 Tone Cards Consolidation**

Feature name

MSL: NT3X68 Tone Cards Consolidation

Description

The MSL-100 switch provides tones to end users to communicate with and notify them of specific conditions. Some of these tones are provided by the NT3X68 circuit pack. This circuit pack is manufacture discontinued (MD) because of component obsolescence.

This feature modifies the software so that the NT3X68 circuit pack is replaced with the NT1X80 enhanced digital recorded announcement machine (EDRAM) circuit pack.

The NT1X80 EDRAM circuit pack is a stand-alone peripheral module (PM) that provides the capability of a fully configured DRAM shelf. The NT1X80 EDRAM circuit pack has the following characteristics.

- Provides either four or 16 minutes of announcement time and 30 announcement channels like the DRAM shelf.
- All announcements are downloaded to the EDRAM in the form of a firmware loadfile (called a voice file). Voice files are loaded from tape or disk.
- One EDRAM circuit pack has eight or 32 memory segments holding a total of four or 16 minutes of recording capacity in one slot of the maintenance trunk module (MTM) shelf.
- Each EDRAM circuit pack is connected to the network through DS30 links and can access all 30 channels.
- EDRAM circuit packs may be mixed with DRAMs physically on a shelf and logically in an MSL-100 switch in any combination. All provisioning rules that apply to standard DRAM hardware apply to the allocation of standard announcements to EDRAM circuit packs in an MSL-100 switch.

Although the EDRAM circuit pack is located on the MTM shelf, it is directly connected to the network through DS30 links. Having two links means having two MAP terminal appearances for each circuit pack installed.

It appears as a PM since it is directly connected to the network, and also appears as a trunk, just as does a DRAM.

Each EDRAM circuit pack provides 30 channels used for announcement trunks or tone trunks. The EDRAM circuit pack has a built-in tone function

AX1238

MSL: NT3X68 Tone Cards Consolidation (end)

which provides test tones, prompt tones, and special information tones (SIT). Tone files created by adding tone samples from each 3X68 card can be downloaded the same way as announcement files.

Hardware requirements

MSL: NT3X68 Tone Cards Consolidation requires the NT1X80AA/BA circuit pack.

Limitations and restrictions

MSL: NT3X68 Tone Cards Consolidation has no limitations or restrictions.

Interactions

MSL: NT3X68 Tone Cards Consolidation does not interact with other functionalities.

Datafill

MSL: NT3X68 Tone Cards Consolidation does not affect office parameters or data schema.

Service orders

MSL: NT3X68 Tone Cards Consolidation does not change the Service Order System (SERVORD).

Operational measurements

MSL: NT3X68 Tone Cards Consolidation does not change operational measurements (OM).

Logs

MSL: NT3X68 Tone Cards Consolidation does not change logs.

User interface

MSL: NT3X68 Tone Cards Consolidation does not change the user interface.

Billing

MSL: NT3X68 Tone Cards Consolidation does not generate billing records or changes.

AX1240**MSL: Name Display Character Extension****Functionality name**

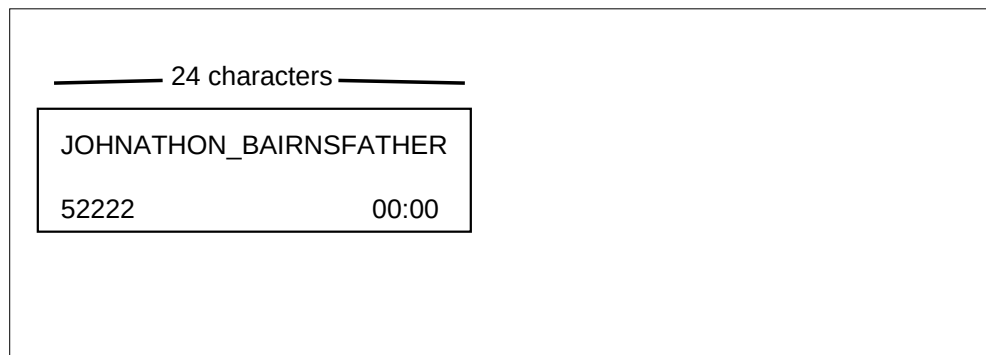
MSL: Name Display Character Extension

Description

This feature gives the user the option of displaying up to 24 characters in the name field on the displays of integrated voice and data (IVD) and Meridian business set (MBS) phones. This option only applies if the phones are physically capable of handling the name size increase.

This feature does not replace the existing 15-character name feature, but is an added option. The option places the 24 character name on the top line of the phone set display and the second line displays the DN, followed by the timer.

This feature increases the length of the name field on the display from 15 to 24 characters. The feature uses all 24 physical spaces on the top line of supported phones (see hardware requirements), leaving no room on the top for the DN. When a call is placed, the originating side displays the name field on the top line and the DN/Timer on the bottom line as shown in the following figure.

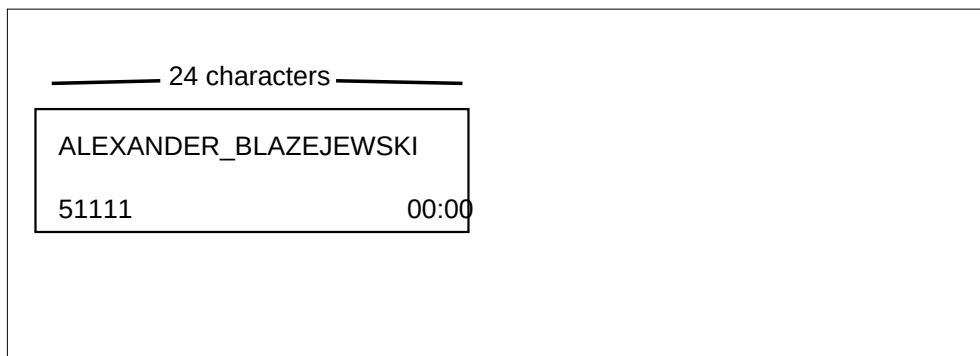
Originator display:

When a call is received on the terminating end, the name field and DN are displayed on the top line with the timer being displayed on the bottom line. This feature allows the DN to be displayed on the bottom line with the timer, leaving room on the top line for all 24 characters to be used for the name.

AX1240

MSL: Name Display Character Extension (continued)

Terminator display:



Accompanying feature

This feature works in conjunction with feature AX1228, CCM: Name Display Character Extension.

Hardware requirements

MSL: Name Display Character Extension is compatible with the following IVD and MBS sets:

- M2006
- M2008
- M2016S
- M2216A
- M2216B
- M2616
- M2616CT
- M5208
- M5209
- M5212
- M5216
- M5312
- M5316

AX1240**MSL: Name Display Character Extension** (continued)**Limitations and restrictions**

The following limitations and restrictions apply to MSL: Name Display Character Extension:

- Autodisp is removed (for example, key-1)
- only MBS and IVD phone sets are supported (see the section, Hardware requirements)
- this feature is only supported on calls within the MSL-100 system
- the 24-character name display is not supported in a non-PBX environment (for example, across the network). PRI and CCS7 networks only support 15 characters for the name display. Refer to service orders for datafill examples.

Interactions

This feature interacts with the features Reasons and Autodisplay. When the Reasons feature is used, the 15-character NAME (for example, Conference, Call Forward) is displayed.

The Autodisplay feature is displayed on the bottom line of the LCD. It lets the called party know what key the calling party is using during the call. Because the DN is moved to the bottom line of the display in the Name24 feature, it would take the space of the Autodisplay feature (refer to limitations and restrictions).

Datafill

Table LCCOPTS keeps a list of the KSET phones supported by this feature.

Service orders

MSL: Name Display Character Extension adds an option in SERVORD called NAME24. Both NAME and NAME24 options are datafilled to use the Name24 feature. This allows a 15-character name to be displayed when the call is external and a 24-character name when the call is internal.

AX1240

MSL: Name Display Character Extension (continued)

Example datafill for NAME option (network calls)

```
>ADO
>$
DN_OR_LEN:
>9975120
OPTKEY:
>1
OPTION:
>NAME
NETNAME:
>PUBLIC
DISPLAYNAME:
>A_BLAZEJEWSKI
NETNAME:
>$
OPTKEY:
>$
COMMAND AS ENTERED:
ADO NOW 98 6 23 AM 9975120 (1 NAME (PUBLIC A_BLAZEJEWSKI) $ ) $
```

Example datafill for NAME24 option (internal calls)

```
>ADO
>$
DN_OR_LEN:
>9975120
OPTKEY:
>1
OPTION:
>NAME24
DISPLAYNAME:
>ALEXANDER_BLAZEJEWSKI
OPTKEY:
>$
COMMAND AS ENTERED:
ADO NOW 98 6 23 AM 9975120 (1 NAME24 (ALEXANDER_BLAZEJEWSKI) $
```

Operational measurements

MSL: Name Display Character Extension does not affect operational measurements.

Logs

MSL: Name Display Character Extension does not affect logs.

AX1240

MSL: Name Display Character Extension (end)

User interface

MSL: Name Display Character Extension does not change the user interface.

Billing

MSL: Name Display Character Extension does not affect billing.

AX1245

XPM: NI-2 User Side Development—Phase II

Functionality name

XPM: NI-2 User Side Development—Phase II

Description

This feature provides the XPM layer support for feature AX1227, CCM: NI-2 User Side Development—Phase II. Refer to the feature description for feature AX1227.

Accompanying feature

This feature works in conjunction with feature AX1227, CCM: NI-2 User Side Development—Phase II.

Hardware requirements

XPM: NI-2 User Side Development—Phase II has no hardware requirements.

Limitations and restrictions

XPM: NI-2 User Side Development—Phase II has no limitations or restrictions.

Interactions

XPM: NI-2 User Side Development—Phase II has no functionality interactions.

Datafill

XPM: NI-2 User Side Development—Phase II does not affect data schema tables or office parameters.

Service orders

XPM: NI-2 User Side Development—Phase II does not affect SERVORD.

Operational measurements

XPM: NI-2 User Side Development—Phase II does not affect operational measurements.

Logs

XPM: NI-2 User Side Development—Phase II does not affect logs.

AX1245

XPM: NI-2 User Side Development—Phase II (end)

User interface

XPM: NI-2 User Side Development—Phase II does not change the user interface.

Billing

XPM: NI-2 User Side Development—Phase II does not affect billing.

BC1523

IVD maintenance

Functionality name

IVD Maintenance

Description

This feature includes two new maintenance and diagnostic procedures. Peripheral Maintenance or Digital Line Module (DLM) maintenance is associated with functions supported specifically for the DLM controller (6X51 and 6X52) and the Parallel Space Time Switch (PSTS or 8X46). Facility maintenance functions affect diagnostic routines on the facility side of the IVD product set, such as the IVD port cards (IVDPC), the subscriber loop, and Meridian sets.

Peripheral maintenance

DLM maintenance functions generate a series of tests that check the DLM hardware. Full out-of-service (OOS) diagnostics are performed if the DLM is busy. Call processing is not available during OOS diagnostics. If the DLM is in service, only a small set of tests that do not affect service are run. Call processing continues during in service diagnostics.

The following is a list of the maintenance and diagnostic tests available on a DLM to test the hardware components on the 6X51, 6X52 and 8X46 cards.

- Processor memory (6X51 and 8X46 cards)
- Memory check sum (6X51 and 8X46 cards)
- Sanity timeout (6X51 and 8X46 cards)
- Parity trap
- Write protect trap
- Timing
- Time counter
- Inter-unit communication loop-around
- PSTS loop-around test
- PSTS activity test
- Receive transmit time switch connection memory
- Receive transmit multiplex connection memory
- Line address connection memory
- DCC-PSTS loop-around connection memory

BC1523**IVD maintenance** (continued)

- Line card communication
- PSTS connection memory

All of these tests except the PSTS test were previously supported on the 6X51 and 6X52 cards of a line connecting module. Since the PSTS is designed to simulate and replace existing Bus Interface Cards (BIC), all BIC tests are functionally supported on the PSTS. The PSTS processor and on-board memory is also diagnosed by the new memory tests.

If the PSTS fails, the MAP terminal provides appropriate card lists and their corresponding circuit locations in the DLM. Similarly, the output logs now reflect PSTS failures instead of BIC failures, as they did previously.

Facility maintenance

Facility maintenance functions provide diagnostic routines for the facilities of the IVD product, such as the IVD port card, subscriber loop, and the Meridian set. These tests can detect, isolate, and identify facility failures. Because the Meridian set is designed to operate in a PBX environment with short loops and digital transmission facilities, traditional test methods using relays are no longer feasible. New maintenance tests use loop-around techniques and station tests that originate from the Meridian set. These tests can isolate problems down to the card level.

Diagnostic tests

This feature provides the following diagnostic tests:

- status requests that provide status information related to IVD port cards and Meridian sets
- signaling channel loopback tests that check messaging hardware through the PSTS to the Meridian set
- MADO self tests that check the MADO hardware
- a PCM/Data byte loop-around that checks the integrity of the PCM path or data path through to the loop-around point

BC1523

IVD maintenance (continued)

- bit error rate tests (BERT) that measure data error rates to identify marginal hardware components
- station access tests that test the following functions on the Meridian set:
 - ringing
 - keypad and digit generation
 - speaker operation
 - tone generation
 - light indicators

Maintenance functions

Periodic maintenance action is invoked on Meridian sets using the ALT (Automatic Line Test) level of the MAP workstation. Maintenance commands are similar to those provided for P-phones and data units. However, because of different Meridian hardware and function, the actual implementation will vary. This feature provides the following facility maintenance functions:

- A short diagnostic test that provides limited hardware testing capability up to the line card level. This test is useful as a periodic maintenance test and applies equally to a voice or data circuit on the Meridian set. This test only interferes with the circuit under test and does not affect its mate.
- An extended diagnostic test that is a more thorough test of the Meridian hardware. This test interferes with both circuits of a Meridian set, so checks must be made to ensure that both circuits can be removed from

BC1523**IVD maintenance** (continued)

service before beginning the extended diagnostics. There are separate diagnostics for voice and data lines.

- The extended voice line diagnostics include the following tests:
 - signaling loop-around at the PSTS
 - a port card present test
 - a set presence test
 - signaling loop-around at the TCM (Time Compression Multiplexing)
 - PCM loop-around test at the PSTS, TCM, and the CODEC (coder/decoder)
- The extended data line diagnostics include the following tests:
 - signaling loop-around test at the PSTS
 - port card presence test
 - set present test
 - signaling loop-arounds at the TCM and the MADA (Meridian Asynchronous Data Adapter) X12 interface
 - MADA self test
 - PCM loop-around at the PSTS, TCM, MADA X12, and the USART
- A post command that identifies a Meridian set or group of sets to the LTP (Line Test Position) for maintenance purposes. This command allows users to designate all lines in a logical drawer (equivalent to an IVD port card) as a set. When a set is selected for maintenance, it can consist of voice only, data only, or all voice and data circuits.
- control position to a specified state.
- A return to service (RTS) command that changes the state of the circuit in the control position from the Manual Busy (MB) state to the idle (IDL) state.
- A circuit locate command that displays the location identifier of the circuit in the control position.
- Hold, NEXTH, and NEXTP commands that are used to select and manipulate circuits in the “control” and “hold” positions of the LTP. The commands are the same as in the current implementation for P-phones and data units.

BC1523

IVD maintenance (continued)

Automatic line tests (ALT)

Automatic line testing on Meridian sets includes testing of line cards and the subscriber loops. Automatic line testing normally runs on a large group of lines during low traffic periods.

For Meridian sets, only short and extended diagnostics ALT tests are performed. The short diagnostic checks most of the line card for correct operation. The extended diagnostic checks a higher proportion of the line cards for correct operation. This test is not performed as frequently as the short diagnostic because it takes longer to run.

Tests not provided for Meridian sets are the line insulation test (LIT) and the On-hook Balance Network (BAL) test. The line insulation test checks the subscriber's loop for foreign potentials and leakage resistances. These tests are not applicable in the digital transmission environment of the Meridian set and are therefore not provided.

The following kinds of tests are included as part of the line insulation tests:

- EMF foreign potential (AC and CD)
- Tip to ground resistance
- Ring to ground resistance
- Tip to ring resistance

The on-hook balance test is run when new line circuits are being placed in service. After that, they are only run occasionally.

Hardware requirements

This feature adds maintenance capability for the IVD product. It therefore requires all of the DLM hardware, including the Meridian 2000 series sets.

Limitations and restrictions

IVD Maintenance has no limitations or restrictions.

Interactions

This feature works in conjunction with feature BC1534, as well as existing POTS (plain ordinary telephone service), P-phone, and DU diagnostic commands.

Datafill

IVD Maintenance does not affect data schema tables or office parameters.

BC1523
IVD maintenance (end)

Service Orders

IVD Maintenance does not affect SERVORD.

Operational measurements

IVD Maintenance does not affect operational measurements.

Logs

IVD Maintenance does not affect logs.

User interface

IVD Maintenance does not change the user interface.

Billing

IVD Maintenance does not affect billing.

BC1524

IVD Call Processing

Functionality name

IVD Call Processing

Description

This feature provides basic voice call processing for Meridian sets on MSL-100 digital switches. The Meridian series consists of the M2112, M2018 and Compact Asynchronous Data Adapter (CADA). The M2112 provides an integrated handsfree feature and twelve feature keys. The M2018 provides eighteen feature keys and accepts one add-on module that is either a corded handsfree module or a dual headset module.

The programmable keys on the Meridian set support the following features:

- Directory numbers (DN)
- Call Park (CPK)
- Three-Way Conference Calling (TWC)
- Six-Way Conference Calling (SWC)
- Call Transfer (CT)
- Call Waiting (CWT)
- Ring Again (RAG)
- Privacy Release (PRL)
- Call Forward (CFU, CFI)
- Call Pickup (CPU)
- Speed Calling - Long (SCL)
- Speed Calling - Short (SCS)
- Intercom (INT)
- Make Set Busy (MSB)
- Malicious Call Hold (MCH)
- Message Waiting (MWT)
- Private Business Line (PBL)
- Busy Override (BOV)
- Autodial (AUD)
- Handsfree (on the M2112 and M2112/Disp models only)

BC1524**IVD Call Processing** (continued)

The following keys are not programmable on the Meridian set:

- Release
- Hold
- Volume up
- Volume down
- Primary DN (must be the first key)

Basic Call Operation

The following tables show the steps in basic call operation for the Meridian IVD sets.

Off-hook dialing

Action	Response
Lift handset	PDN (primary directory number) lamp comes on, dial tone is received through handset
Talking on PDN - press SDN (secondary directory number)	Auto-hold PDN call (PDN lamp winks). SDN lamp comes on, dial tone is received through handset.
Talking on SDN - press PDN	Auto-hold SDN call (SDN lamp winks). PDN lamp comes on, dial tone is received through handset.
Press first digit	Dial tone is replaced with silent tone.
Complete dialing number	Termination within switch results in audible ringing or treatment as per dialing plan, or termination on another switch through a trunk results in PCM (pulse control module) cut-through when outpulsing is complete.
Other end answers	PCM cut-through enabling talk path. Applicable to termination within switch configuration.

BC1524
IVD Call Processing (continued)

On-hook dialing (Use of handset after answer)

Action	Response
Press PDN key	PDN lamp comes on, dial tone is received through speaker.
Press SDN key	SDN lamp comes on, dial tone is received through speaker.
Press first digit	Dial tone is replaced with silent tone.
Complete dialing number	Termination within switch results in audible ringing or treatment as per dialing plan, or termination on another switch through a trunk results in PCM cut-through when outpulsing is complete.
Other end answers	PCM cut-through enabling talk path. Applicable to termination within switch configuration.
Lift handset	Talk through handset.

On-hook dialing (Handsfree)

Action	Response
Press handsfree key	PDN lamp comes on, handsfree lamp comes on, handsfree talking is enabled, dial tone is received through speaker.
Handsfree talking on PDN - press SDN	Auto-hold PDN call (PDN lamp winks). SDN lamp comes on, dial tone is received through speaker, handsfree lamp comes on.
Handsfree talking on SDN - press PDN	Auto-hold SDN call (SDN lamp winks). PDN lamp comes on, dial tone is received through speaker, handsfree lamp comes on.
Press first digit	Dial tone is replaced with silent tone.
Complete dialing number	Termination within switch results in audible ringing or treatment as configured for dialing plan, or termination on another switch through a trunk results in PCM cut-through when outpulsing is complete.
Other end answers	PCM cut-through enabling talk path. Applicable to termination within switch configuration.

BC1524**IVD Call Processing** (continued)

Heading	Heading
Other end dials PDN	PDN lamp flashes. Ringing tone is given if set is on the hook. Two seconds of buzz tone given if set is off the hook (not idle).
Lift handset if the set is on the hook	PDN lamp comes on. Alerting tone is canceled.
Talking on SDN on handset - press PDN key	Unit buzzes. SDN call is put on auto-hold. SDN lamp winks, PDN lamp comes on. PDN cut-through, handset enabled for conversation.
Press handsfree key	Handsfree talking enabled. Handsfree lamp comes on, PDN lamp comes on.
Handsfree talking on SDN, press PDN key	SDN put on auto-hold. SDN lamp winks, PDN lamp comes on. Handsfree lamp comes on (still handsfree).
Talking on SDN, put SDN on hold	SDN lamp winks, call on hold.
Talking on handset, press PDN key	PDN lamp comes on.
Talking handsfree. Press PDN key	PDN lamp comes on, hands free lamp comes on (still handsfree).
Lift handset	PDN lamp comes on, handsfree lamp off, talking through handset.

Termination (Sheet 1 of 2)

Action	Response
Other end dials SDN	SDN lamp flashes. Ringing tone is given if set is on the hook. Two seconds of buzz tone given if set is off the hook (not idle).
Press flashing SDN key, left handset if it is on the hook	SDN lamp comes on. Alerting tone canceled.

BC1524**IVD Call Processing** (continued)**Termination (Sheet 2 of 2)**

Action	Response
Talking on PDN on handset - press SDN key	Unit buzzes. SDN call put on auto-hold. SDN lamp winks, PDN lamp comes on. PDN cut-through, handset enabled for conversation.
Press flashing SDN key, press handsfree key.	SDN lamp comes on and stops flashing. Handsfree lamp comes on, handsfree talking is enabled.
Press flashing SDN key, press handsfree key.	SDN lamp comes on and stops flashing. Handsfree lamp comes on, handsfree talking is enabled.
Handsfree talking on PDN, press SDN key	PDN put on auto-hold. PDN lamp winks, SDN lamp comes on. Handsfree lamp comes on (still handsfree).
Talking on PDN, put PDN on hold.	SDN lap winks, call goes on hold.
Talking on handset, press SDN key	SDN lamp comes on.
Talking handsfree. Press SDN key	PDN lamp on, hands free lamp comes on (still handsfree).

Handsfree operation

Pressing the handsfree key allows users to talk to another party on the Meridian IVD set without using the handset. Although the IVD set has on-hook dialing capability, the handsfree key must be pressed during the call for the user to be able to talk without using the handset. Pressing the handsfree key while the set is idle activates the handsfree mode and the primary DSN to make a call. Handsfree talk is disabled and the handsfree lamp goes off if the user lifts the handset during the call. To activate handsfree mode again, press the handsfree key and return the handset to its cradle.

Once handsfree mode is active, it remains active until the user presses the handsfree key again, lifts the handset, or the call is disconnected. For example, if the handsfree feature is active and the user puts a call on hold and then places a second call on another line, handsfree mode is still in effect for the second call.

To have a conversation with people in the same room using handsfree mode without allowing the person at the other end of the line to hear, activate the mute feature by pressing the handsfree key again. This causes the handsfree indicator to display a delay flash. To turn the mute feature off, press the

BC1524

IVD Call Processing (end)

handsfree key once again. To disconnect the call while in handsfree mode, press the release key.

Hardware requirements

In addition to the Meridian IVD sets, this feature requires the following hardware:

- IVD digital line module (DLM)
- Integrated Voice Data Line Card (IVDLC)
- DLM Parallel Serial Time Switch (PSTS)

Limitations and restrictions

IVD Call Processing has no limitations or restrictions.

Interactions

IVD Call Processing has no functionality interactions.

Datafill

IVD Call Processing does not affect data schema tables or office parameters.

Service Orders

IVD Call Processing does not affect SERVORD.

Operational measurements

IVD Call Processing does not affect operational measurements.

Logs

IVD Call Processing does not affect logs.

User interface

IVD Call Processing does not change the user interface.

Billing

IVD Call Processing does not affect billing.

BC1525

IVD table control—phase I

Functionality name

IVD Table Control—Phase I

Description

The purpose of this feature is to provide the table control and data structures to support the Meridian IVD (Integrated Voice and Data) sets. Existing tables KSETLINE and KSETFEAT establish line and feature appearances on IVD sets, P-phones, and data units. Table IVDINV, which is very similar to table KSETINV, is a new customer table. Table IVDINV contains the following configuration information:

- The LEN to which the set is assigned
- The Meridian set type
- The type of ringing
- Optional equipment included in the set

Table KSETFEAT controls the following categories of features that are assigned to Meridian sets:

- set features
- subset features
- key features
- directory number features
- code access features

Set features

Set features control all directory number appearances on a set. A set feature is usually assigned to a vacant key on the set. The exceptions are code access features. Set features include the following:

- Three-Way Calling (3WC)
- Call transfer (CTR)
- Six-Way Conference (6WC)
- Call Park (PRK)
- Executive Busy Override (EBO)
- Speed Calling - Long (SCL)
- Speed Calling - Short (SDS)

BC1525**IVD table control—phase I** (continued)

- Speed Calling - User (SCU)
- Make Set Busy (MSB)
- Malicious Call Hold (MCH)
- Ring Again (RAG)
- Privacy Release (PRL)
- Network Resource Selection (NRS)
- Query Time and Date (QTD)
- Directed Call Park (DCPK)

Subset features

Subset features are associated with a specified subset of the DN appearances on the set. Subset features are usually assigned to a vacant key on the set. Code access features are the exceptions. Subset features include the following:

- Call Pickup (CPU)
- Call Forwarding (CFX)
- Call Waiting (CWT)

Key features

Key features must be assigned to a vacant key on the set. They are independent of any DN appearances. There is more than one appearance of each of these feature keys on a single set. Key features include automatic dial (AUD) and intercom (ICM).

Directory number features

Directory number features do not require a separate key on the set and are associated with an individual DN appearance on the set. These features are assigned to as many of the DN appearances on the set as necessary. Directory number features include the following

- Automatic Line (AUL)
- Special Billing (SPB)
- Denied Incoming (DIN)
- Subscriber Line Usage (SLU)
- Line Study (SDY)
- Calling Line Identification (CLI)
- Do Not Disturb (DND)

BC1525

IVD table control—phase I (continued)

- Private Business Line (PBL)
- Random Make Busy (RMB)
- Requested Suspension (RSUS)
- Stop Hunt (SHU)
- Security Code (SEC)
- Automatic Answerback (AAB)
- Message Waiting (MWT)

Note: Automatic Answerback and Message Waiting apply only to the set's primary DN.

Code access features

Many of the set features and subset features can be assigned as code access features. When assigned as code access features, they do not require a separate key on the set. The feature is activated by dialing the access code for the specific feature. If the call state is not idle (for example is ringing, busy, or an active call), the user must precede the access code by pressing either the three-way calling or call transfer key to generate a flash.

The following features can be assigned as code access features:

- Speed Calling - Long (SCL)
- Speed Calling - Short (SDS)
- Speed Calling - User (SCU)
- Call Park
- Directed Call Park
- Executive Busy Override
- Conference Calling
- Make Set Busy
- Malicious Call Hold
- Call Pickup
- Call Forwarding
- Automatic Answerback

Hardware requirements

IVD Table Control—Phase I has no hardware requirements.

BC1525**IVD table control—phase I (end)**

Limitations and restrictions

IVD Table Control—Phase I has no limitations or restrictions.

Interactions

IVD Table Control—Phase I has no functionality interactions.

Datafill

One new customer (logical) table, table IVDINV, is required to support the Meridian sets. Table IVDINV is a new table implemented in new table control. It contains Meridian set configuration information. This table is datafilled at any time after the LNINV table is datafilled. There are no default tuples to be entered. Dump and restore this table.

There are four input tuple formats for this table, one for each of the three different Meridian voice sets and one for the data adapter (CADA). The SET_TYPE field defines the type of set. To define the set type, enter one of the following in the SET_TYPE field as appropriate

- M2009 for Meridian M2009 sets
- M2112 for Meridian M2112 sets
- M2018 for Meridian M2018 sets
- CADA for a Compact Asynchronous Data Adapter

Service Orders

IVD Table Control—Phase I does not affect SERVORD.

Operational measurements

IVD Table Control—Phase I does not affect operational measurements.

Logs

IVD Table Control—Phase I does not affect logs.

User interface

IVD Table Control—Phase I does not change the user interface.

Billing

IVD Table Control—Phase I does not affect billing.

BC1535

MADO profile

Functionality name

MADO Profile

Description

This feature provides the ability to datafill profile information for the Meridian 2000 series Asynchronous Data Option (MADO). The table used for the datafill is the existing table DPROFILE. This table is used to download profile information to data devices and for datapath feature reference and information.

The MADO profile captures data from service order and table control input, and allows users to set up the data communication parameters of the MADO at the MAP workstation and then download them to the MADO board when the line is returned to service.

This feature is resident in the Datapath subsystem that is optional to IBN (Integrated Business Network). Without a MADO profile, the user can only set the baud rate and parity.

MADO profile downloading

To activate this feature, provide the correct datafill in the DPROFILE table and set the DOWNLOAD parameter to "YES". This can be done by using service orders or by table control. Next, at the LTP level of the MAP workstation, execute the return-to-service (RTS) command for the MADO line.

Note: Posting the line and returning it to service is unnecessary for datafill additions made through service orders, because this action is performed automatically.

When the line is returned to service, the profile is downloaded from the Central Control (CC) to the Parallel Space Time Switch (PSTS) for the MADO line, and from the PSTS down to the MADO board. Because the MADO board has only volatile RAM (Random Access Memory) in which to store the profile, the PSTS stores the profile indefinitely and transfers the profile to the MADO unit upon recovery from a local power loss. If the DOWNLOAD parameter is not set to "YES", it defaults to "NO" and the profile is not downloaded. Error messages are displayed if problems are encountered when attempting the profile download at return-to-service time.

DU (Data Unit) profile table

The DU profile parameters are stored in table DPROFILE. Each entry in the table contains the field DPKEY, followed by a set of fields containing the profile parameters. DPKEY is the key identifying each entry in table

BC1535**MADO profile** (continued)

DPROFILE. DPKEY consists of the line equipment number (LEN) associated with the data unit's line card. Invalid datafill for a MADO adapter causes an error message to display on the MAP workstation.

Hardware requirements

To configure a Meridian 2000 series set, the line module must be a Digital Line Module (DLM). There must also be a Parallel Space Time Switch (PSTS or 8X46) card present. The Meridian 2000 series sets can then be connected to Integrated Voice/Data Line Cards (IVDLC or 8X47), with a maximum of 16 voice sets per card. Each of the sets can optionally be equipped with a MADO board.

Limitations and restrictions

MADO Profile has no limitations or restrictions.

Interactions

MADO Profile has no functionality interactions.

Datafill

Datafill Table DPROFILE after table KSETINV, RESINV, and IVDINV. The DPROFILE tuple must be deleted before the corresponding tuple can be deleted from table KSETINV, RESINV, or IVDINV.

Error and warning messages can be encountered while using table control to datafill the DPROFILE table. An error prevents the command from being executed while a warning points out circumstances that require attention even though the command is executed properly.

Each data unit requires nine words of protected data store, consisting of four words for the dprofile_suppl_data block and five words for an entry in the DPROFILE table. An additional 390 words of protected store are required to hold the descriptors to the DPROFILE table and its free space map. This free space map consumes one bit of protected store per DU profile. Memory is allocated dynamically.

Service Orders

MADO Profile does not affect SERVORD.

Operational measurements

MADO Profile does not affect operational measurements.

BC1535

MADO profile (end)

Logs

MADO Profile does not affect logs.

User interface

MADO Profile does not change the user interface.

Billing

MADO Profile does not affect billing.

BC1536**IVD call processing audits**

Functionality name

IVD Call Processing Audits

Description

This feature provides Central Control (CC) audits to ensure that Integrated Voice and Data (IVD) calls are in the correct state, as well as synchronization audits to ensure lamps are in the correct state.

Audits for IVD sets are applied in two separate processes. The first process is the auditing of erroneous CC states. The second is the synchronization of valid CC states with equivalent LGC states and the refreshing of lamps based on the CC active feature status for certain features.

The synchronization audits are applied to all LCM/DLM-based terminals. The parameters `LSYNC_BURST_THRESHOLD`, ranging from 0 to 1000, and `LSYNC_DELAY_THRESHOLD`, ranging from 5 to 6000, control the number of sets that are audited consecutively and the wait period in seconds between bursts. These parameters are found in table OFCENG. The software initializes the `LSYNC_BURST_THRESHOLD` to 1 and `LSYNC_DELAY_THRESHOLD` to 15. The customer can modify these values.

The task that drives the audits “loops” over each peripheral as well as each terminal datafilled on these peripherals, which includes all Meridian, P-phone, and POTS types. This procedure ensures that every set is audited on a regular and equal basis. The frequency with which a particular set is audited is directly related to the number of datafilled sets. If there are only a few sets datafilled, these sets are audited much more often than if there are numerous sets.

The audit task audits all datafilled terminals that are in the idle state, regardless of whether the set is actually present. If a set is not idle when it is next to be audited, it will not be audited until the next audit cycle. For example, if there are 100 datafilled sets and the audit parameters are set to the default parameters, it takes 25 minutes to audit every set. If there are 1000 sets, it takes 250 minutes, or four hours and ten minutes, to audit every set. If invalid lamp states are invoked on a set and that particular set was audited just before the bad lamp states, it will take more than four hours for the audits to come back around and refresh the lamps.

BC1536

IVD call processing audits (end)

Hardware requirements

This feature requires that a Digital Line Module (DLM) be connected between the Meridian IVD sets and the LGC/LTC. The LGC must be upgraded with the new XMP memory cards and refitted with the following cards:

- NT6X47AB MP Memory card
- NT6X46AB SP memory card
- two NT6X45AC Processor card

Limitations and restrictions

IVD Call Processing Audits has no limitations or restrictions.

Interactions

IVD Call Processing Audits has no functionality interactions.

Datafill

IVD Call Processing Audits does not affect data schema tables or office parameters.

Service Orders

IVD Call Processing Audits does not affect SERVORD.

Operational measurements

IVD Call Processing Audits does not affect operational measurements.

Logs

IVD Call Processing Audits does not affect logs.

User interface

IVD Call Processing Audits does not change the user interface.

Billing

IVD Call Processing Audits does not affect billing.

BC1537
IVD data call processing

Functionality name

IVD Data Call Processing

Description

A Meridian Asynchronous Data Option (MADO) is an RS-232 data communications board that fits inside Meridian digital telephones. The MADO units permit the connection of telephones with ASCII terminals and personal computers for optimal data distribution. When making a data call using the MADO unit in a Meridian M2000 series set, the phone number must be dialed using the terminal or PC keyboard. This is called keyboard dialing. MADO offers the same call processing features that data unit call processing offers. MADO call processing follows data unit call processing where possible.

MADO keyboard dialing supports the following features:

- Call to local host
- Autodial
- Speed Call
- Resource Call (modem pooling)
- Ring Again
- Automatic answering of incoming calls

The following utilities are also provided with this feature:

- Updating of Autodial number and Speed Call
- Set and reset remote loopback status
- Cancellation of pending Ring Again
- Status and data query

Hardware requirements

The following hardware is required for this feature

- An MSL-100 digital switch
- Digital Line Module (DLM)
- Meridian M2000 series set
- An 8X46 Parallel Space Time Switch (PSTS) card
- An 8X47 port card

BC1537

IVD data call processing (continued)

Limitations and restrictions

The following limitations and restrictions apply to IVD Data Call Processing:

- The only method of dialing and activating features for the MADO unit is through keyboard dialing. The central control responds to keyboard-dialed features as though a feature key were pressed
- If a call terminates while the user is using keyboard dialing, any items entered are discarded.
- Call Back Queuing is not available.

Interactions

IVD Data Call Processing interactions are the same as those for data unit call processing.

Datafill

Table IVDINV is required to support the Meridian sets. Table IVDINV is a new table implemented in new table control. It contains Meridian set configuration information. This table can be datafilled at any time after the LNINV table is datafilled. There are no default tuples to be entered. Dump and restore this table.

There are four input tuple formats for this table, one for each of the three different Meridian voice sets and one for the data adapter (CADA). The SET_TYPE field defines the type of set. To define the set type, enter one of the following in the SET_TYPE field as appropriate

- M2009 for Meridian M2009 sets
- M2112 for Meridian M2112 sets
- M2018 for Meridian M2018 sets
- CADA for a Compact Asynchronous Data Adapter

Service Orders

IVD Data Call Processing does not affect SERVORD.

Operational measurements

IVD Data Call Processing does not affect operational measurements.

Logs

IVD Data Call Processing does not affect logs.

BC1537

IVD data call processing (end)

User interface

IVD Data Call Processing does not change the user interface.

Billing

IVD Data Call Processing does not affect billing.

BC1538

IVD service orders

Functionality name

IVD Service Orders

Description

This feature provides users with service capabilities for Meridian digital telephone sets. Commands allow users to add and delete subscriber entries in the database, add or delete options for subscribers, suspend or restore their service, and query information on a subscriber.

Note: Private Branch Exchange (PBX) customer service parameters, feature access codes, or route lists cannot be modified using service orders. This type of data is not related to an individual subscriber and can only be changed by altering system data tables using the table editor

A service order number is associated with each service order. To enter a service order, users enter a service order command. The system prompts the users for parameters until all required parameters are entered. Experienced users can also have the option of entering all of the parameters on one line without using the prompts. When all information required in the service order is entered, the data is verified extensively and distributed to the various required tables. Editing is available to correct any input errors that might occur.

All previous service order commands were retained to handle Meridian sets and MADO boards. Existing checking applies to Meridian sets and MADO boards as well. All service orders applicable to P-phones and data units will also be applicable to Meridian voice sets and MADO boards. However, some commands prompt the user for information in different ways. MADN (Multiple Appearance Directory Number) input for Meridian sets is the same as for P-phones. The MADN feature is fully supported for Meridian sets.

A new option, Ring Type, is available for IVD (Integrated Voice and Data) sets. It allows users to change the ring type of a set that has already been datafilled. This option can only be used with the CHF (Change Feature) command.

Note: This Ring Type option is not the same as the RINGTYPE set data that is prompted for when establishing new service.

BC1538**IVD service orders** (continued)

The Ring Type feature can only be used with the CHF command. This option must be associated with key 1 of the set. The IVD set must already be datafilled.

Note: The ring type can be changed for the primary MADN appearance; however, the secondary MADN appearance always uses the default ring type.

Changes to commands

The NEW command has been changed so that users creating a new Meridian set or MADO line must specify the Line Class Code (LCC). The system then prompts the user for additional items, such as group, options, and data transmission parameters. The specific items depend on the type of LCC chosen.

DNH (Directory Number Hunt), MLH (Multi Line Hunt), DLH (Directory Line Hunt) and BNN (Bridged Night Number) hunt groups are now supported for Meridian sets.

When using the EST (Establish) command, users creating a new Meridian set or MADO line must now specify the Line Class Code (LCC). For each subsequent hunt group member, the user must specify a KEY, DN and LEN. If the hunt group member listed is a different data type than the pilot, the system prompts for the LCC and data profile information. The system does not allow the mixing of data and voice in a hunt group. For example, if the pilot is voice, all members must be voice.

The ADD command has been changed so that the system looks at the Line Equipment Number of the member to determine if it is an IVD set. If so, the system prompts for the LCC and ring type. This applies only to MLH, DLH, and DNH hunt groups.

The ADO (Add Option) command is used to add features to feature keys of Meridian sets or MADO units. The MADO unit has no visible keys and does not prompt the user for key number entry when adding features to a MADO unit. All features for the MADO are activated through keyboard dialing. Even though the MADO unit has no keys, key numbers are required for table control. The MADO unit's keys are pre-defined to allow feature assignment. The user enters only the feature desired and the system assigns the feature to the appropriate key. The keys and their reserved features are as follows:

- Key 1—Directory number
- Key 2—Network resource (allows the user to use Modem Pooling)

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IVD service orders (continued)

- Key 3—Autodial
- Key 4—Speed calling
- Key 5—Volume up
- Key 6—Volume down
- Key 7—Ring again

The DEO (Delete Option) command deletes features from keys on a Meridian set or MADO unit. The LEN, KEY, and option being deleted must be specified.

The OUT command removes a set from service. The command uses as parameters the DN, the LEN, and the intercept, such as BLDN. If the OUT command is used on a secondary DN (SDN), only that DN is removed from the set. If it is used on the primary DN (PDN), the entire set is removed.

For service orders, the ACD command is handled for Meridian sets as it is handled for P-phones. MADN (Multiple Appearance Directory Number) input for Meridian sets is the same as for P-phones. The MADN feature is fully supported for Meridian sets. Meridian sets do not support the AUTOVON feature.

The CHF command now allows users to use the Ring Type option to change the ring type of an IVD set that has been datafilled. With this option, users can change the ring type without having to change any other information on the set. The Ring Type option can only be used on an IVD set.

Options

All features and options available on P-phones and data units are available on Meridian voice sets and MADO units with the exceptions of the EXT option for add-ons and extension sets. The MADN option for creating a MADN Meridian DN is the same as for P-phones. A MADN group can be added to a set either during the creation of the set using the NEW command or by adding it as an option using the ADO command. The user can query the directory number of the MADN group to see which LENS are associated with it. This lists the type of MADN along with each LEN associated with it.

Hardware requirements

The Meridian 2000 series sets must be configured in a Digital Line Module (DLM - 8X45AA). The Parallel Space Time Switch (PSTS-8X46) is part of the DLM. A single DLM consists of two units, each of which contains from

BC1538**IVD service orders** (continued)

one to five IVDPCs. The line card used for the Meridian sets is the Integrated Voice and Data Port Card (IVDPC - 8X47AA).

Limitations and restrictions

The following limitations and restrictions apply to IVD Service Orders:

- The EXT (extension/add-ons) option is not available because the M2000 series sets do not support extensions or add-ons.
- The PLP command is not allowed for IVD sets
- When assigning LENs (Line Equipment Numbers) to a DLM, users can enter only 0 to 9 in the drawer or line subgroup position of the LEN. For example, if a user wants to assign an IVD set to LEN 2 0 1 10, the third position, which is the 1 in this case, is the drawer number of the LEN.
- When assigning features to a 12-key Meridian set (M2112), the twelfth key is automatically assigned to the twelfth key of an M2112 set.
- Meridian port cards contain 32 lines (16 voice and 16 data lines) that is not physically detached from a port card in the same way that a line card can be removed from a drawer. If a line becomes disabled, it is not simply pulled out and replaced. Because the one line is attached to the port card, removing the port card could interrupt the 31 other lines that are still good. To allow continuing service, another line can be assigned to the user. However, to do so frees the bad LEN, which another user can now choose. To avoid assigning a bad LEN to another user, enter this LEN in the IVDTRVL table. This table is checked before a LEN can be assigned to establish service.
- The Ring Type option is not valid for use with any set other than an IVD set that has ring type set data.

Interactions

IVD Service Orders has no functionality interactions.

Datafill

IVD Service Orders does not affect data schema tables or office parameters.

Service Orders

Service orders include the Meridian line of digital terminals. Meridian voice sets are treated similarly to P-2000 series P-phone sets. The MADDO unit is treated similarly to the data unit.

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IVD service orders (end)

Service orders include new prompts for data hunt group members. When adding a data device to a hunt group, the software prompts for the Line Class Code (LCC) and profile information for the member if this device differs from the device listed as the pilot of the group.

When using the NEW and EST commands, IVD LCCs can only be associated with an 8X47 line card and not a P-phone line card. LENs for 8X47AA card cannot be used if a LEN associated with an IVD line card is entered but a P-phone LCC is associated with the LEN. When using the CHF (Change Feature) command, error messages are generated if the ring type is changed incorrectly.

The new field RINGTYPE is not prompted for in the case of a MADO unit. It is applicable only to voice sets. This field is prompted for in the NEW, ADD, and EST commands. This new option does not depend on any other option.

This feature introduces four new LCCs. They are as follows:

- M2009
- M2112
- M2018
- MADO

None of the new LCCs support the EXT option, because there are no extensions or add-on modules of features keys for the Meridian sets.

Operational measurements

IVD Service Orders does not affect operational measurements.

Logs

IVD Service Orders does not affect logs.

User interface

IVD Service Orders does not change the user interface.

Billing

IVD Service Orders does not affect billing.

BC1548
IVD CP features

Functionality name

IVD CP Features

Description

This feature supports the options and user features available on the Meridian Integrated Voice and Data (IVD) sets.

Non-optional keys

All Meridian sets have hold, release, and volume control keys. These keys are not optional and are not programmable.

Hold

The hold function has two modes of operation: manual and autohold. A call can be put on hold by pressing the hold key (manual operation). Selecting another DN (directory number) while a call is engaged puts the original call on hold (autohold) and activates the new call. In both cases, the lamp associated with the held call changes from burning steadily to winking. The user can then originate or answer a call on another DN. The hold key does not have an associated lamp.

Release

The release key terminates a call. The lamp associated with the released call goes off. The release key does not have an associated lamp.

Volume control

The speaker volume is controlled by the two volume control keys that are labeled "volume up" and "volume down". These keys incrementally increase or decrease the volume.

Optional feature keys

The IVD set has feature keys with associated lamps. The lamps can be on, off, flashing at 60 impulses per minute (IPM), or winking at 120 IPM. The feature keys can be assigned a subset of the following possible features:

- Directory Numbers (DN)
- Call Park (PRK)
- Three-Way Conference (3WC) or Call Transfer (CT)
- Call Waiting (CWT)
- Ring Again (RAG)
- Call Back Queueing (CBQ)

BC1548

IVD CP features (continued)

- Privacy Release (PRL)
- Call Pickup (CPU)
- Speed Calling (SC)
- Intercom (INT)
- Do Not Disturb (DND)
- Make Set Busy (MSB)
- Malicious Call Hold (MCH)
- Message Waiting (MWT)
- Private Business Line (PBL)
- Busy Override (BOV)
- Auto Dial (AUD)
- Handsfree (M2112 set only)

Along with feature keys, the Meridian sets also support code access features. They do not support a switch hook flash.

Directory numbers and multiple appearance directory numbers

The IVD set typically has two DN's, one of which is the prime directory number (PDN). The bottom feature key is always assigned a DN, and is usually the prime DN. Each DN requires one key and associated lamp. Multiple Appearance Directory Number (MADN) is an MSL-100 feature that makes it possible for multiple line appearances to be associated with a single directory number. Any line appearance sharing the same MADN can originate calls subject to regular IBN (Integrated Business Network) line restrictions. When an incoming call is terminating on the MADN, all line appearances are alerted and anyone can answer the incoming call. The two basic variants of the MADN are multiple call arrangements (MCA) and single call arrangements (SCA).

Call park

The Call Park feature provides IVD stations with the capability of holding a call against a directory number appearance in the system. Any station can later retrieve the call. The call is parked against the directory number of the user who requested the feature. The person retrieving the call can do so from any station by first requesting Call Park retrieve and then dialing the directory number of the station against which the call was parked. Once a call is parked against a DN appearance in the system, the user is free to originate and receive calls on that DN.

BC1548**IVD CP features** (continued)

Three-way conference calling and call transfer

Three-Way Conference Calling allows users to establish a three-way conference call. While actively engaged in a call, the user presses the Conference key, dials the third party and presses the Conference key again to connect all three parties. Once the three parties are conferenced, press the release key to transfer the call or hang up.

Six-way conference calling

Six-Way Conference Calling allows a user to establish a six-way conference call. While actively engaged in a call, the user presses the Conference key, dials the third party, then has the option to alternate between the two parties or press the Conference key again to connect all three. Repeat the procedure to connect a fourth, fifth or sixth party.

Call waiting

If another call attempts to terminate on an engaged DN, the user is notified. The user has the option of pressing the Call Waiting key to autohold the original call and answering the waiting call, alternating between the two calls, or terminating the calls.

Ring again

When encountering a busy number, press the Ring Again key to activate the Ring Again (RAG) feature, go on hook, and if desired, originate or answer other calls. The user is notified by buzzer or lamp wink when the busy end becomes free. To cancel a RAG request, press the RAG key while it is in an active (but not notification) state.

Call back queueing

Call Back Queueing is similar to the Ring Again feature. It allows a user to make a Ring Again request on a busy trunk in addition to a busy line. Upon hearing a busy tone, reorder tone, ERWT, or no circuits announcement, press the RAG key to make a CBQ request. If the request is allowed, the RAG lamp becomes lit and the DN lamp goes off. If the request is not allowed, the keystroke is ignored. When the trunk group or line becomes available, an audible RAG notification tone occurs and the RAG lamp changes from solid to winking. The user can answer the recall by pressing an inactive DN and then the RAG key. The RAG lamp goes out and the DMS tries to complete the call over the trunk or line. Cancel the request at any time by pressing the RAG key again. As with the RAG feature, the request cannot be canceled while the user is being notified that the trunk or line is free.

BC1548

IVD CP features (continued)

Privacy release/MADN

MADN SCA (Multiple Appearance DN, Single Call Arrangement) normally has privacy associated with an active call. This means that other members in the MADN group are denied access to that DN. The station engaged in an active call can activate the Privacy Release key. Another member can now press the DN to enter the call. Once entered, privacy is re-established.

Call forward

Call Forward allows a station user to have incoming calls automatically forwarded to a programmed telephone number. The user programs the number to receive forwarded calls by pressing the Call Forward key, dialing the destination number, and pressing the Call Forward key again. The Call Forward status lamp is on while Call Forward is active.

Call pickup

Call Pickup enables a station to answer incoming calls to another station in the same call pickup group. To activate this feature, press the Call Pickup key after obtaining a dial tone.

Speed calling

Speed Calling allows users to store numbers in a speed calling list. To use Speed Calling, the user obtains a dial tone, presses the Speed Call key and dials the one- or two-digit access code. The list of stored Speed Call numbers can also be reprogrammed using the Speed Call key.

Intercom

The Intercom feature allows a user to establish a voice connection to the loudspeaker of a preselected station. To activate, go off hook and press the Intercom key. This establishes the voice connection. The receiving end can then establish a normal connection by going off-hook and selecting the Intercom channel.

Do not disturb

Only the attendant can make IBN lines individually busy to incoming calls by using the DNDIS (Do Not Disturb Individual Station) feature. The attendant must also reset the status of a line so that the line can receive incoming calls again. Therefore, a person on an IBN line has to call the attendant initially to make the line busy to incoming calls, then a second time to make it available again to accept calls. Users can make their own sets appear busy without the help of the attendant by invoking the Make Set Busy feature.

BC1548**IVD CP features** (continued)

Make set busy

By activating the Make Set Busy key, the station appears busy to all incoming calls. The station user can still originate calls. The associated lamp remains on while the feature is active.

Malicious call hold

The Malicious Call Hold feature allows the user to hold a connection within the switching unit on a malicious call, enabling the call to be traced back to the originating party. If both parties are terminated in the switching unit, the entire connection is held until the called party releases the call. If the call is on an incoming trunk and terminates within the switching unit, the connection is only held back to the incoming trunk. When this feature is activated, a log report generates and an alarm sounds at the switching center.

Message waiting

A Message Waiting lamp indicates to a station user that a message is waiting at the message center. If the customer has defined a message center, the user dials the message center directory number (MCDN) to retrieve messages. The message center attendant controls the DN's message lamp.

Private business line

The Private Line feature allows a direct dial "9" trunk to be associated with a DN appearance on the set.

Executive busy override

When encountering a busy signal, a set equipped with the Busy Override feature can break into the busy connection. This feature is activated when the user presses the Busy Override key. Both parties of the busy connection are notified by a tone of an impending override. A three-way call is then established that consists of the activating station and the original busy parties.

Automatic dial

One or more feature keys can be designated as automatic dial. This allows the users to store one telephone number in a feature key. Once the dial tone is obtained, the feature automatically dials the programmed number.

Hardware requirements

This feature requires the following hardware:

- MSL-100 digital switch
- Digital Line Module (DLM)
- Meridian 2000 series set

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IVD CP features (continued)

- PSTS (8X46) card
- 8X47AA port card

Limitations and restrictions

The Private Business line cannot be a member of the MADN feature. Although the PB line resembles a POTS line, no POTS features can be assigned to it. The PB line cannot use the code access features available on the set. These code access features are as follows:

- Call Forwarding
- Call Pickup
- Speed Calling
- Call Park

Interactions

This section describes the interactions between features.

Call park

The interactions between the Call Park feature and other features that can be assigned to either the calling or receiving party are listed below. It is assumed that the parking party is a P-phone or Meridian set DN appearance and that the feature has been activated using the Call Park key.

Three-way calling or call transfer

While a call is in the Call Park primed state (Call Park is activated), neither party can initiate three-way calling or call transfer. The Call Park store feature is disabled on calls in which three-way calling or call transfer are in effect. However it is possible to press the Three-way Call key, then press the Call Park key and dial the parked DN to retrieve a parked call on the second leg of a three-way call.

Call waiting

The Call Waiting feature allows a call to be waited against a P-phone or Meridian set DN involved in a call on which Call Park has been activated. In such situations, if the Call Waiting key is pressed to access the waiting call, the original call is automatically held, and the Call Park request is canceled. It is possible to park a call that is active on the Call Waiting key. However, the recall is always presented to the primary DN. Call Park recalls to the parking station are never call waited.

BC1548**IVD CP features** (continued)

Call forwarding

Call Park recalls to the parking station are not call forwarded, even if Call Forwarding was previously activated on the station. This is true no matter which variation of the Call Forwarding feature is assigned.

Executive busy override

If an incoming call attempts to activate the Executive Busy Override feature on a call that is in Call Park primed or Call Park held states, the attempt is denied and the calling party receives a reorder tone.

Ring again

The activation of Call Park on a call does not affect Ring Again requests from either the parking or the parked party. Such requests are handled in the normal manner once the party against whom the Ring Again request was made releases the call.

Call pickup

Accessing a Call Park recall from a station other than the one being recalled is possible using the Call Pickup feature. Once accessed in this manner, the call is automatically unparked.

Straight intercom

The Call Park feature is deactivated on straight intercom calls because intercom lines have no directory number against which the call can be parked.

Do not disturb and make set busy

Activating either the Do Not Disturb or Make Set Busy features on a station does not prevent Call Park recalls to that station. Make Set Busy can be activated even while the call is in Call Park Confirm, Call Park Primed, or Call Park Held states.

Call line identify with flash and malicious call hold

It is not possible to activate the Calling Line Identify with Flash (CLF) or the Malicious Call Hold features on a call that has been primed for parking. A restriction on the Call Park feature prevents the originator of a call from activating Call Park if the terminator has either the CLF or MCH feature assigned.

Speed calling and automatic dial

To retrieve parked calls, it is possible to use either Speed Calling or Automatic Dial to specify the digits against which the call to be retrieved was originally parked. This is done only after the user presses the Park key and receives a

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IVD CP features (continued)

special dial tone. In these situations, the lamps associated with either of these features functions in the usual manner.

Multiple appearance directory number

MADN group members with either the single call or multi-call arrangements have access to the Call Park feature. Since all members of a MADN group share the same directory number, only one member is allowed to park a call at any time. If the Call Park recall occurs, it only rings the station of the MADN member that originally parked the call.

Privacy release

The privacy release feature is deactivated on calls that are primed for parking.

Private business lines

Although Call Park is a set feature on Meridian stations, it does not apply to private business lines (PBL). If a user presses the Park key while a station is active on a PBL directory number, the appearance is ignored.

Attendant camp-on

It is not possible for the attendant to activate the camp-on feature on a call that was primed for parking. In such situations, the attendant receives reorder treatment.

Attendant busy verification

An attendant attempting to busy-verify a line involved in a call on which the Call Park was activated is given reorder treatment. This is true whether the call is in Call Park Primed or Call Park Held states.

Three-way calling and transfer

The following feature interactions are virtually the same as those for existing IBN three-way calling:

Hold

If an inactive DN key is pressed at any time, any currently active DN is put on hold. This can include the conference itself.

Call waiting

The user does not receive Call Waiting notification while active on a three way call. The user can initiate a three-way call while Call Waiting is active.

Answer a call on the CWT key by pressing the 3WC key to originate a second leg of the call, assuming the 3WC key is not currently being used with another DN. The second leg is subject to restrictions and billings as if it were the set's PDN.

BC1548**IVD CP features** (continued)

Three-way calling

Three-way calling interacts with itself. The user can initiate a three-way call on one DN, hold the second leg of the call, and use another DN. However, if the user presses the 3WC key while active on a second DN, it is ignored. This is because the system cannot determine if pressing the 3WC key applies to the second leg of the first call, or is intended to initiate a second three-way call.

Ring again

The user can use the RAG key on the second leg of a call. If the user presses the RAG key during an audible busy tone on the second leg of a three-way call, the RAG request is activated and the three-way call lamp turns off.

Privacy release

If the PRL key is pressed while the three-way call is active, it is ignored.

Call forward

If the terminating party of the second leg of the 3WC has Call Forwarding active, the call is forwarded and becomes a normal call.

Automatic dial

Press the 3WC key, then the AUD key to dial the second leg of the call.

Call pickup

The terminating party of the second leg of the 3WC can be picked up. The originator of the second leg of the 3WC cannot use the CPU key or dial the CPU access code to connect to another station's call in the Call Pickup group.

Speed calling

The originator of the second leg of the 3WC can press the Speed Calling key and the Speed Call Digit access code to dial the third party.

Access codes

The user cannot use the 3WC key to simulate a flash and then dial an access code for a feature.

Attendant camp on

If a call is camped on to a two-port call, the user receives an audible camp-on tone. The user can use the 3WC key to alternate back and forth between the camped-on party and the original party.

Attendant recall

If the attendant has extended the call to a third party and then placed both on hold, either user can then press the 3WC key to recall the attendant.

BC1548

IVD CP features (continued)

Busy override

Users encountering a busy tone on the second leg of the 3WC cannot use the Busy Override (BOV) feature. Busy override is not possible on the three-port conference once the user is connected.

Automatic answer back

The second leg of a 3WC can terminate on a phone with automatic answer back.

Six-way calling

Users cannot originate on the 3WC key while a conference is active on another DN, or use the Six-Way Calling feature when a three-way call is active on a DN.

Private business line

A private business line is used for the first leg of a three-way call.

Authorization codes and account codes

Enter authorization codes or account codes on the second leg of the three-way call the same as on a 500/2500 set

Uniform call distribution

On the second leg of a call, the user can terminate on a Uniform Call Distribution (UCD) directory number. The call can also be conferenced.

Six-port conference

The conference feature can be assigned to any Meridian set as long as it has at least one DN that can originate calls. All feature interactions for a Meridian set 30-port conference follow that of the IBN flexible station conference with the following clarifications:

- Thirty-port conference is a set feature and applies to every DN on the set that can originate calls. However, it does not apply to private business lines on the set.
- If a set is assigned the Call Waiting feature and is active in a 30-port conference, any incoming calls to the set are call waited if the set is not involved in a consult call.
- If one of the members of the conference call is a P-phone or Meridian set with Call Waiting, an incoming call to this set is also call waited.
- The consult call to a busy line with the CWT/CWI option is not call waited.

BC1548**IVD CP features** (continued)

- Consult calls to a Multiple Appearance Directory Number can be transferred to the conference, provided the call is answered. A MADN line can also originate a 30-port conference.
- If the attendant is reached on the consult call, the controller has no control over the conference. The controller cannot conference the attendant. Control is returned to the controller when the attendant either releases the consult call or extends the call to another part.
- If a Telco operator is reached on the consult call, it is connected through a trunk and therefore the controller would not lose any conferencing capabilities.

Call waiting

The following interactions apply to Call Waiting:

- A call is waited only if the line is in talking state.
- Call Waiting does not apply to Busy Verification by the attendant.
- If the called station activates Call Forward Universal or Call Forward Intragroup, the Call Waiting feature is disabled for the duration that either of these two features is active. Call Forward Busy and Call Waiting are compatible. The first call to a busy station with CFB is waited and subsequent calls are forwarded to CFB DN. Call Forward Don't Answer is incompatible with Call Waiting. A Call Waited call is not forwarded if it is not answered.
- Call Waiting does not apply to attendant-originated calls. If the called station is busy, the attendant receives a busy tone.
- The called station is able to invoke the conference feature from the Call Waiting key. This means the attendant can have a conference on the Call Waiting key as well as another conference on the DN key. The only restriction is that the attendant cannot conference a call on one of the DNs with the waited call. Any six-port conference call is call-waited on P-phone and Meridian sets only.
- Call Waiting is subject to called line restrictions. A call is only waited if the called station is permitted to receive the call type.
- Call Waiting applies to night service type calls. If the called station is also a night station, calls placed directly to the station do not have priority over night service calls.
- Call Waiting cannot be assigned to any DN that uses the No Double Connect option.

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IVD CP features (continued)

- Call Waiting and Attendant Camp-on are mutually exclusive. Attendant Camp-on is a customer group parameter and Call Waiting is assigned for each set or DN. If both are applicable to a DN, Call Waiting has precedence.
- Executive Busy Override does not break in on a call-waited call. However, override on the DN call that has a call-waited call is possible.

Speed calling

The following feature interactions apply to Speed Calling:

- Speed Calling is transparent to Call Forwarding and Make Set Busy. The subscriber can assign or use the Speed Calling feature while Call Forwarding is active without noticing any difference in the feature's performance.
- The Speed Call number cannot be updated while the line is busy on a call.
- MSL-100 does not support cut-through dialing, so pause insertion is unnecessary. Asterisks cannot be inserted to serve as timed pauses.
- Speed calling can be used to establish a six-port conference call, a three-way call, and to transfer a call.
- It is possible to put a call on hold and update a number in a Speed Calling list. However, it is not possible to program a set when another set has put it on hold.

Intercom call

An intercom call cannot have any features active on it. A user can put an intercom call on hold or make use of autohold, but the system ignores any attempts to activate any features on it.

Make set busy

This section describes the effect of the MSB feature on other features that can be assigned to the Meridian set. Features not mentioned here function as usual even on a busy set.

Ring again

The Ring Again feature takes precedence over MSB. Outstanding Ring Again requests are handled in the normal fashion on Meridian sets in the make busy state. However RAG requests from other parties on a Meridian set in the make busy state are not permitted.

BC1548**IVD CP features** (continued)

Call waiting

If MSB All Calls is assigned, the Call Waiting feature is deactivated on all DN appearances while the Meridian set is in the make busy state. If MSB Intragroup is assigned, only intragroup calls are prevented from Call Waiting on a busy set.

Executive busy override

Attempts by incoming calls to activate the Executive Busy Override (EBO) feature are blocked on Meridian sets made busy, but the calling party receives a reorder tone as the default treatment instead of a busy tone.

Call forwarding

The Call Forwarding feature interacts with the Make Set Busy feature as follows:

- Calls to DN appearances on which the Call Forwarding Universal or Call Forwarding Intragroup variations have been activated are forwarded regardless of whether the set is made busy or not.
- Calls to DN appearances assigned the Call Forwarding Busy or Don't Answer variation always receive the treatment specified for MSB.
- Call Forwarding Universal and Intragroup variations always take precedence over all other variations, whether the MSB feature is activated or not.

Intercom

Make set busy does not affect the intercom feature. Intercom calls terminate on Meridian sets even if the MSB feature is activated on the set.

Attendant originate, extend

If the attendant attempts to originate or extend a call to a DN appearance on a Meridian set in the make busy state and the set is assigned the MSB All Calls feature, the attempts are blocked. In this situation, the message "MSB ACTIVE" appears on the console's display and the attendant is given two seconds of reorder tone. If the MSB Intragroup feature is assigned to a set, the attendant is always allowed to terminate on an idle DN appearance on the set whether or not MSB is activated on that set.

Signal source, signal destination

If the attendant attempts to signal a DN appearance on a Meridian set in the make busy state, it is handled in the normal manner.

BC1548

IVD CP features (continued)

Do not disturb

The Make Set Busy feature takes precedence over the attendant-activated DND feature. Treatments specified for MSB apply when both MSB and DND are activated on a given line. If both MSB and DND stations are active on a line and MSB is deactivated, the DND is also deactivated. If the attendant attempts to activate or deactivate DND on a Meridian line on which MSB is activated, the message "DISALLOWED" appears on the console.

Operator verification

The busy verification lines (BVL) feature is the only attendant feature that overrides the make set busy feature. An attendant applying Busy Verify on a Meridian set in the make busy station is unaware of the MSB feature.

Attendant camp-on

Attendant camp-on is not possible on Meridian sets in the make busy state. The attendant is given reorder treatment and the message "MSB ACTIVE" appears on the console's display if it is equipped with a display key.

Malicious call hold

This section describes how activating Malicious Call Hold on a call affects the operation of other features

Three-way calling and call transfer

Attempts to initiate Three-Way Calling or Call Transfer from a call held by MCH are denied regardless of whether they are initiated by the calling or called party. All code access features are also denied on MCH held calls.

Call waiting

For POTS (plain old telephone service) and IBN stations, the Call Waiting feature is not compatible with MCH. The Call Waiting feature is deactivated on calls held by MCH, so that the originating party receives busy treatment.

Executive busy override

Incoming calls attempting to activate the Executive Busy Override feature on calls held by MCH are blocked and the calling party receives the reorder tone.

Call park

Calls held by the MCH feature cannot be parked on the Meridian set.

Attendant camp-on

Attendant camp-on is not possible on calls on which the MCH feature is active and the attendant is given reorder treatment.

BC1548**IVD CP features** (continued)

Busy verification

The attendant is not able to busy-verify a line involved in a call on which the MCH feature is active. In such cases, a busy tone is applied to the attendant console.

Busy verification trunks (barge-In)

The attendant is not able to barge in on a trunk involved in a call on which the MCH feature is active. In such cases, a busy tone is applied to the console.

Message waiting

This section describes how Message Waiting affects the operation of other features.

Attendant extended calls

The following feature interactions apply to attendant extended calls:

- Attendant extended calls to a station do not follow the Call Forward No Answer feature. If the station is idle, the attendant extended call is not forwarded to the message center.
- Attendant extended calls to a station do not follow the Call Forward Busy feature.
- Attendant extended calls to a station do not follow the Call Forward Busy feature.
- Attendant Camp-on or Call Waiting is applicable if the customer group has the Camp-on feature or the station has the Call Waiting feature.
- Attendant originated calls to a station follow the Call Forward No Answer and Call Forward Busy features. Attendants are allowed to queue for the message center attendants.
- If attendants serving as the message center are in subgroup 0 and are in night service, calls are not forwarded to the message center. Message center attendants in subgroup 1 to 7 are routed to subgroup 0.

Recalls

Calls recalled by the Call Park or Permanent Hold feature or terminated by the Call Hold feature to a station are not subject to Call Forward No Answer or Call Forward Busy. Message center forwarding is not applicable for these recalls.

Ring again and call back queueing

Recalls of queued calls (either Ring Again or Call Back Queueing) are not subject to Call Forward No Answer.

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IVD CP features (continued)

Call forward

A station can have one or both of Call Forward No Answer or Call Forward Busy to another station, or one or both of Call Forward No Answer or Call Forward Busy to the message center. Call Forward Universal and Call Forward Intragroup, when activated, supercede the Call Forward No Answer and Call Forward Busy Features. A station can program Call Forwarding to the message center through the Call Forward Universal and Call Forward Intragroup features.

Note: Call Forward Busy and Call Forward Don't Answer can be datafilled as different DNs.

Station busy features

The Do Not Disturb, Make Set Busy, and Ring Again features override the Call Forward feature. The message center is not applicable to calls with active Do Not Disturb.

Multiple appearance directory number

Message Waiting for stations belonging to a MADN group have Message Waiting activated against the prime set only. The primary member owns call requests against the MADN group. This feature is applicable to the primary member only.

Hunt group

For Directory Number Hunt groups (DNH), Message Waiting is applicable for the station. For Directory Line Hunt and Multi-Line Hunt, Message Waiting is activated for the pilot DN only. Stations in a hunt group can have the Call Request feature. This feature operates in the activate mode only. The pilot owns call requests against the hunt group.

When the Message Waiting feature is assigned to a Meridian station, it applies only to the station's primary directory number. Message Waiting is not available to secondary DN appearances on Meridian stations. Message Waiting can only be assigned to the primary member of a MADN group. For this reason Message Waiting cannot be assigned to Meridian stations where the PDN is a non-primary MADN group member.

Private business line

The Meridian set features that have a key are not available to the Private Business Line (PBL). These features include the following:

- Call Transfer
- Three-Way Calling

BC1548
IVD CP features (continued)

- Ring Again
- Speed Calling
- Automatic Dial
- Conference 6
- Busy Override
- Automatic Answer Back
- Make Set Busy

The PBL can use the hold and the release key. All flashes on the PBL are ignored.

The PBL cannot have any subset features included with the PBL. The subset features include:

- Call Pickup
- Call Forward
- Call Waiting

If an existing SDN key with subset features is changed to a PBL key, the subset features must be deleted before assigning the PBL keys.

The PBL cannot have any receptacle features associated with the DN. These features consist of the following:

- Automatic Line
- Special Billing
- Denied Incoming
- Subscriber Line Use

Any existing receptacle feature must be deleted before assigning the PBL key.

Busy override

With the exception of Call Waiting, feature interactions for Meridian Executive Busy Override follow that of IBN EBO. A Meridian set with EBO and CWT option is call waited while active with EBO because Meridian CWT does not require a three-port conference circuit. EBO can barge in on a call on a Meridian set that has a call-waited call.

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IVD CP features (continued)

Only one authorization or account code per key can be stored. The user cannot store a directory number plus an authorization code or an account code against the AUD key. The authorization code cannot be stored with an access code because the Meridian set does not support a flash. Automatic Dial can store dialed feature access codes that the set may have, such as Call Forwarding, Call Pickup, or Call Park.

The Automatic Dial feature also interacts with the following features:

- A pound sign (#) is used to indicate the end of the number. The number is not stored.
- Automatic Dial can establish a six-port conference call or three-way conference call, and can also transfer a call.
- Call Forwarding can be activated to a number contained in an AUD key if the set has both features. This activates Call Forwarding to the number stored against the AUD key when the feature is in use.
- The AUD key updates a number in the Speed Call list. The system does support pressing multiple keys while programming.
- It is possible to put a call on hold and update the number associated with the AUD key. However, it is not possible to program while on hold.

MADN

The following features and options cannot be used with MADN:

- UCD - Uniform Call Distribution
- CSDDS - Circuit Switched Digital Data Systems
- All hunt groups

The following features and options interact with MADNs on a line or member basis, but are handled by existing call processing:

- DOR - Denied origination
- DTM - Denied termination
- FNT - Free number termination
- RSUS - Requested suspension
- SUS - Suspended line
- PLP - Plug up
- DIN - Denied incoming
- CLI - Calling line identification

BC1548**IVD CP features** (continued)

- CLF - Calling line identification with flash
- COD - Cut off on disconnect
- SPB - Special billing

Do Not Disturb, Group Intercom, and Automatic Line are incompatible with MADN. All other features and options are compatible or independent of MADNs.

Executive Busy Override cannot barge in on the MADN end of a MADN call. This is because EBO is used to barge in on a specific talking party. However, with MADNs there is no way for the user of EBO to know which MADN member is active. A MADN member can be the third party in a call in which an EBO barges in because the member identity is unimportant in this situation.

IBN call forwarding

Call Forwarding is assigned on a group-by-group basis. Call Forwarding is compatible with MADNs, but with the following restrictions:

- The MADN group must have a primary member.
- The Call Forwarding option is only set on, or assigned to, a primary member's line.
- Call Forwarding DN subsets for Meridian sets cannot include non-primary MADN group members.
- For the CFU, CFI, and CFUI varieties of Call Forwarding, only the primary member can program, activate, and deactivate Call Forwarding for the group.
- Also for CFU, CFI, and CFUI, only the primary member receives the ring splash as the call is forwarded.
- For Call Forwarding Don't Answer, the entire group is rung for the datafilled amount of time before the call is forwarded.
- When CFB, CFD, or CFBD is assigned to the primary member's line or when CFU, CFI, or CFUI is activated by the primary member, the entire call is forwarded. This means that once a call is forwarded from a MADN group, no member of that group can answer that call.
- When a forwarded call reverts back to a CFD station that is a MADN, the entire group is rung again as a normal incoming MADN call.

Three-way calling

Three-way calling is assigned on an individual line or individual member basis. If an MADN group member who is active in a conference call that was

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IVD CP features (continued)

initiated using Privacy Release attempts to create a second conference using Three-Way Calling, the attempt is ignored. MADN, like all other IBN lines, only allows one active conference for each DN.

Call waiting

Call Waiting is assigned on an individual line or individual member basis. If a MADN SCA group member is active with a call and a second call is made to this MADN, the MADN terminator selects the active member to terminate on.

Incoming calls are waited on the line or set, not the whole group, and follow normal Call Waiting feature restrictions. If Call Waiting is available on a P-set and the MADN is a member of the Call Waiting DN subset list, a second call coming in to this active MADN member is waited on this member Call Waiting key. For 500 and 2500 sets, if Call Waiting has been assigned to an active MADN member's line, a second incoming call is waited on this member. If this member terminates the present call by going on-hook, only this set is rung again.

Call park

Call Park is assigned on an individual line or individual member basis. Only the member of the group who parked the call is rung again when the parking meter times out. Because the call is parked against the DN, only one call can be parked per MADN group.

Call pickup

Call Pickup is assigned on an individual line or individual member basis. However, MADN group members are not restricted to belong to the same Call Pickup group or to belong to any group at all. Call Pickup behaves the same with MADN lines as with any other IBN extended line.

TAFAS

MADN can serve two purposes with TAFAS. A MADN group can be a TAFAS device that can be answered directly or picked up using the TAFAS access code. A MADN group member can also answer a TAFAS call using the access code.

Ring again

Ring Again is assigned on an individual line or individual member basis. It behaves the same as Ring Again for a normal line. Any member is allowed to initiate Ring Again and only that member receives the Ring Again recall for that call. As per normal lines, only one Ring Again request is allowed per MADN member.

BC1548**IVD CP features** (continued)

Subscriber line usage

Subscriber Line Usage can only be set on an individual member or line basis, through the use of office equipment numbers. Attempts to assign SLU to a MADN are flagged as an error and a message is displayed.

Busy verify line

If an attendant busy-verifies an idle MADN group, only the selected primary member is terminated. The other member's lamps go on and they are locked out.

Preset conference

If a MADN is included in the call out list of a preset conference, only the selected primary member is terminated. The other member's lamps go on and they are locked out.

Do not disturb

DND, Group Intercom, and Automatic Line are incompatible with MADN.

Datafill

IVD CP Features does not affect data schema tables or office parameters.

Service Orders

IVD CP Features does not affect SERVORD.

Operational measurements

IVD CP Features does not affect operational measurements.

Logs

There are two different log reports associated with the MCH (Malicious Call Hold) feature. One is used when the calling party is on a line. The other is used when the call is from a trunk. These reports are identical to those used for the calling identification with flash (CLF) feature on IBN lines since MCH is the P-phone equivalent of CLF. Included in the log report for line originations (LINE126) is the DN and LEN, while the trunk report (LINE125) includes the common language name and circuit number of the incoming trunk. The reports also specify the time and date of the call.

For P-phone sets that are assigned the MCH feature, these log reports are only generated when the feature is activated, not every time a call terminates on one of the set's DN appearances. If a subscriber wishes to have a report of every call termination on a particular P-phone line, then the calling line identification

BC1548

IVD CP features (end)

(CLI) feature must also be assigned. Because CLI is not a set feature, CLI must be assigned to individual DN appearances on a P-phone set.

User interface

IVD CP Features does not change the user interface.

Billing

IVD CP Features does not affect billing.

BC1558
Digital set diagnostics

Functionality name

Digital Set Diagnostics

Description

This feature tests the hardware of the Meridian M2000 set. It is similar to the MSL-100 Electronic Telephone station ringer test. This diagnostics program provides a unique visual or audio response to each key that is pressed to verify the operation of the set.

To begin the test, the set must be idle with the handset on-hook. The tester presses a loop key and dials a two- or three-digit access code and the last five digits of the directory number. The last five digits are checked to ensure that they are the same as what is registered on the switch as the telephone number of the subscriber. If they are different, the tester receives a reorder tone. The tester presses the release key to stop the test. If the digits are correct, all the LCDs on the set come on. When the test is finished, a lamp audit restores the lamps to their pre-test state.

The tester then performs a series of specific operations on the handset, dial pad, and feature keys of the unit. These tests must be performed in a specific order, and a specific response must be given for each test. Handsfree operation is not tested for the M2009 and M2018 sets. Eleven keys are tested on the M2112 and nine keys are tested on the M2009.

Hardware requirements

For this feature, a Digital Line Module must connect the Meridian IVD sets and the LGC (Line Group Controller). Because of the increase in LGC code, the LGC must be upgraded with the new XPM memory cards. The LGC must be refitted with the following:

- a NT6X47AB MP Memory Card
- a NT6X46AB SP Memory Card
- two NT6X45AC Processor Cards

BC1558

Digital set diagnostics (end)

Limitations and restrictions

The following limitations and restrictions apply to Digital Set Diagnostics:

- No terminations are allowed on any of the set's other VIDs while the test is in progress because the restricted Boolean parameter of the UNPROT DATA line is set to "true".
- The tester has seven minutes to perform the test. Tests can be complete either by performing all of the operations or by a time-out. When the test is completed, the restricted Boolean parameter is reset on all the VIDs. Regardless of the hook state, the set is completely idled, with no dial tone or other originating supervision.
- This test is not valid for the MADO unit. Users cannot initiate the test from a data line.

Interactions

A tester trying to perform the test when any other loop keys are not idle receives the reorder tone. No attempt is made to restore LCDs to their pre-test state. If a feature key's LCD is on before the test begins, it goes off before the end of the test and the feature remains in the same state as before the test.

Datavill

Digital Set Diagnostics does not affect data schema tables or office parameters.

Service Orders

Digital Set Diagnostics does not affect SERVORD.

Operational measurements

Meridian sets use the same OMs as P-phones.

Logs

Digital Set Diagnostics does not affect logs.

User interface

Digital Set Diagnostics does not change the user interface.

Billing

Digital Set Diagnostics does not affect billing.

BF0625
IVD LGC requirements

Functionality name

IVD LGC Requirements

Description

This feature provides the changes required in the terminal processing task that affect call processing in the Line Group Controller (LGC) for the Meridian and SL-Touch set digital telephone families. The Meridian set uses the X12 Digital Station Interface Chip (DSIC) to interface between a two-wire full duplex TCM (Time Compression Multiplexed) loop and the voice and data functions in the set. The Digital Line Interface Chip (DLIC) performs the protocol conversion between DS-30X serial PCM (Pulse Code Modulated) data on the processor side and eight TCM twisted-pair subscriber loops connected to eight IVD sets. The DLIC on the loop side interfaces with the DLIC chip on the IVD set.

Meridian sets provide a standard handset, dial pad, programmable function keys and associated indicators, a speaker for voice and tone alerting, a hold key, a release key, and volume control keys. The M2112 set provides an integrated handsfree unit with 11 programmable keys. The twelfth key is assigned to the handsfree function. The M2018 set provides 18 programmable keys and a jack for an add-on handsfree or headset module.

The Compact Asynchronous Data Adapter (CADA) is an 8031-based Data Access Module (DAM) that is installed in a Meridian set. It provides asynchronous data communications between a user's Data Terminal Equipment (DTE) and a DAM using an MSL-100. The user interface consists of keyboard dialing and menus. A CADA set provides true simultaneous voice and data transmission. This means that the user can talk on a Directory Number (DN) line while using the terminal.

The SL-Touch set is an intelligent communications terminal that offers a full complement of MSL-100 features. It uses soft function keys, feature menus, and prompts. The SL-Touch does not have ordinary feature keys with indicators. Instead, functions are activated by touching the soft key labels that appear on a large liquid crystal display. The SL-Touch set includes an integrated handsfree unit and provides for an optional data communications adapter. The MSL-100 is designed for users requiring frequent voice communications who also need voice or text messaging capabilities.

The handsfree unit allows users to talk without lifting the handset from the hook. Pressing the handsfree key on an idle set selects the primary DN for the call. When the set rings on the primary DN, pressing the handsfree key turns

BF0625

IVD LGC requirements (end)

on the handsfree unit and answers the incoming call. To deactivate the handsfree unit, the user can go off hook or press the release key. Pressing the handsfree key while the unit is active mutes the call.

Hardware requirements

For this feature, a Digital Line Module must connect the Meridian IVD sets and the LGC/LTC. Because of the increase in LGC code, the LGC must be upgraded with the new XPM memory cards. The LGC must be refitted with the following:

- a NT6X47AB MP Memory Card
- a NT6X46AB SP Memory Card
- two NT6X45AC Processor Cards

Limitations and restrictions

IVD LGC Requirements has no limitations or restrictions.

Interactions

IVD LGC Requirements has no functionality interactions.

Datafill

IVD LGC Requirements does not affect data schema tables or office parameters.

Service Orders

IVD LGC Requirements does not affect SERVORD.

Operational measurements

IVD LGC Requirements does not affect operational measurements.

Logs

IVD LGC Requirements does not affect logs.

User interface

IVD LGC Requirements does not change the user interface.

Billing

IVD LGC Requirements does not affect billing.

BF0632
MADO T-link firmware

Functionality name

MADO T-link Firmware

Description

This feature provides the firmware required to support the T-link protocol on the Compact Asynchronous Data Adapter (CADA). The Meridian Asynchronous Digital Option (MADO) is a microprocessor-based Data Access Module (DAM) that provides an interface between an RS-232 connection of a DTE (Data Terminal Equipment) and a Digital Set Interface Circuit (DSIC) that maps data onto a channel using T-link protocol. The MADO board uses Time Compression Multiplexing (TCM) technology to map the RS-232 interface onto a two-wire loop. The MADO board operates in a Meridian set on the DMS/SL-100 system. It is powered by an external power supply that plugs into a standard wall socket and is compatible with other Datapath products.

The Datapath Profile is a datafillable table that contains parameters, such as data rate, that characterize a DAM. Information in the table is downloaded from the MSL-100 to the DAM. Many of these parameters that are downloaded to a MADO unit are asynchronous communication parameters. No physical interface exists on the MADO unit that allows entry of parameters. The following are some of the downloaded parameters:

- The Adaptive Profile allows the MADO board to adapt its profile to that of the far end MADO. Depending on the state of this parameter at both ends of the MADO to CADA link, the T-link parameter exchange before establishment of a data link can force one end to adapt its profile to that of the other end. If both MADO units in a connection have the Adaptive Profile option enabled, it is the called party that adapts. If the two MADOs have incompatible parameters and neither unit has the Adaptive Profile option enabled, the call is terminated.
- When the Assert DTR (Data Terminal Ready) option is enabled, it forces the local DTR on logically rather than electrically. The MADO responds as though the local DTR from the DTE is on.
- When the Assert RTS option is enabled, it forces the local RTS (Request to Send) on logically rather than electrically. The MADO responds as though the local RTS from the DTE is on.

BF0632

MADO T-link firmware (continued)

Typical MADO-to-CADA data call

The following describes the typical sequence of a MADO-to-CADA data call.

- After powering up the MADO and the DTE, the user autobauds by typing a period followed by a carriage return. (This only has to be done at power-up unless the DTE baud is changed.)
- The DTE now displays the main menu, listing the selection of features. To dial a number, the user types in the digits and edits them as necessary, then presses the carriage return.
- The DTE displays the number dialed. As call progress messages are received from the MSL-100, they are converted to English messages and displayed on the DTE.
- The MADO unit begins a handshake on the 64 kb/s channel.
- The MADO unit begins communicating using the T-link data protocol.
- The originating and terminating MADOs exchange baud rate and other asynchronous parameters.
- Both MADOs send end-to-end signaling until end-to-end signaling is received from the other end.
- When T-link synchronization is achieved, the DTE displays the connect message.
- The MSL-100 takes the connection down at either end of the connection as a result of either the invocation of the release procedure or the on-to-off transition of the DTR signal.

Hardware requirements

MADO T-link Firmware has no hardware requirements.

Limitations and restrictions

The firmware described in this document can only be used with MSL-100 M2000 series sets.

Interactions

MADO T-link Firmware has no functionality interactions.

Datafill

MADO T-link Firmware does not affect data schema tables or office parameters.

BF0632

MADO T-link firmware (end)

Service Orders

MADO T-link Firmware does not affect SERVORD.

Operational measurements

MADO T-link Firmware does not affect operational measurements.

Logs

MADO T-link Firmware does not affect logs.

User interface

MADO T-link Firmware does not change the user interface.

Billing

MADO T-link Firmware does not affect billing.

BF0808

DLM SW for Meridian digital sets

Functionality name

DLM SW for Meridian Digital Sets

Description

This feature modifies the LCM (Line Concentrating Module) software to interface a Digital Line Module (DLM) to the P-side of a Line Group Controller (LGC). It also provides the peripheral and facilities maintenance software needed to communicate with the Parallel Serial Time Switch (PSTS), the Integrated Voice and Data Port Card (IVDPC), and the Meridian line of digital telephone sets.

The DLM is comparable to an LCM in architecture and purpose. The initial design of the DLM uses the same processor and time switch as the LCM. However, it uses the Parallel Serial Time Switch (PSTS) to replace the Bus Interface Cards (BICs). Existing line cards that supported only one set per card were replaced with IVDPCs that can interface up to 16 sets.

The Control Center (CC) controls the DLM peripheral and facilities maintenance. The DLM acts as an interpreter, accepting messages for itself and reformatting messages bound for the PSTS and Interactive Voice and Data (IVD) sets. The software includes a new command to test the PSTS.

The facilities maintenance software in the DLM supports the testing of the IVDPC, the subscriber loop, and the IVD set. Facilities maintenance consists of three major types of commands that relay information about the components that are functioning properly and those that are not. These three types of commands are as follows:

- status request messages that allow for cross-checking the current state of the set, its MADDO (Meridian Asynchronous Digital Option), and the port card
- message or signaling looparounds that allow testing of the integrity of the data link between the DLM and the PSTS, and between the PSTS and set
- PCM looparounds that allow for noise and loss measurements and Bit Error Rate Testing (BERT) of the PSTS and the IVDPC card

These diagnostics combine with the audit task to run periodic checks of the PSTS hardware and the other components. When the tests detect a fault, a maintenance request is issued to isolate the fault and, if possible, correct it. The software also allows the mate unit of a PSTS to take control if a fault occurs in the prime unit. When the fault is corrected, the prime unit goes back in service.

BF0808**DLM SW for Meridian digital sets (end)**

Hardware requirements

For this feature, a Digital Line Module (DLM-NT8X45) must connect the Meridian IVD sets and the LGC. Release 1W1 or later of the PSTS hardware is also required, including the NT8X49 processor board and the NT8X46 connection memory board. Because of the increase in LGC code, the LGC must be upgraded with the new XPM memory cards. The LGC must be refitted with the following:

- a NT6X47AB MP Memory Card
- a NT6X46AB SP Memory Card
- two NT6X45AC Processor Cards

Limitations and restrictions

Because the DLM differs from the LCM in some ways, several of the LCM facilities maintenance actions are not supported in the DLM.

Interactions

This feature is required for the DLM peripheral to function properly

Datafill

DLM SW for Meridian Digital Sets does not affect data schema tables or office parameters.

Service Orders

DLM SW for Meridian Digital Sets does not affect SERVORD.

Operational measurements

DLM SW for Meridian Digital Sets does not affect operational measurements.

Logs

DLM SW for Meridian Digital Sets does not affect logs.

User interface

DLM SW for Meridian Digital Sets does not change the user interface.

Billing

DLM SW for Meridian Digital Sets does not affect billing.

BF0817

Meridian LGC maintenance

Functionality name

Meridian LGC Maintenance

Description

This feature provides the changes in the base XPM software that are necessary to interface a Digital Line Module (DLM) to the P-side of a Line Group Controller (LGC). It also provides the peripheral and facilities maintenance software needed to communicate with the DLM, the Integrated Voice and Data Port Card (IVDPC), and the Meridian line of digital sets.

The DLM is similar to an LCM in architecture and purpose. The initial design of the DLM uses the same processor and time switch as the LCM. However, it uses the Parallel Serial Time Switch (PSTS) to replace the Bus Interface Cards (BIC). Existing line cards that supported only one set for each card were replaced with Integrated Voice and Data Port Cards (IVDPCs) that can interface up to 16 sets.

The facilities maintenance software in the DLM supports the testing of the IVDPC, the subscriber loop, and the IVD set. Facilities maintenance consists of three major types of commands that relay information about the components that are functioning properly and those that are not. These three types of commands are as follows:

- status request messages that allow for cross-checking the current state of the set, its MADDO (Meridian Asynchronous Digital Option), and the port card
- message or signaling looparounds that allow testing of the integrity of the data link between the port card and the set, and within the set itself
- PCM looparounds that allow for noise and loss measurements of the subscriber loop and set

Facilities maintenance also includes more extensive testing, including station ringer and link integrity tests. Both tests aid in isolating faulty components. The CC also sends additional commands that are part of previous versions of the facilities maintenance package, including those that reset the sets and turn the LCDs on and off.

Hardware requirements

For this feature, a Digital Line Module must connect the Meridian IVD sets and the LGC. Because of the increase in LGC code, the LGC must be

BF0817

Meridian LGC maintenance (end)

upgraded with the new XPM memory cards. The LGC must be refitted with the following:

- a NT6X47AB MP Memory Card
- a NT6X46AB SP Memory Card
- two NT6X45AC Processor Cards

Limitations and restrictions

Because the DLM is different from the LCM in some ways, several of the LCM facilities maintenance actions are not supported in the DLM.

Interactions

This feature is required to interface a DLM to an LGC/LTC. It is used by and uses other features to accomplish the interfacing of the Meridian series of digital sets to the MSL-100 switch.

Datafill

Meridian LGC Maintenance does not affect data schema tables or office parameters.

Service Orders

Meridian LGC Maintenance does not affect SERVORD.

Operational measurements

Meridian LGC Maintenance does not affect operational measurements.

Logs

Meridian LGC Maintenance does not affect logs.

User interface

Meridian LGC Maintenance does not change the user interface.

Billing

Meridian LGC Maintenance does not affect billing.

BF0818

CADA KBD

Functionality name

CADA KBD

Description

This feature provides Keyboard Dialing (KBD) on the MSL-100 Meridian Asynchronous Data Option (MADO). Keyboard dialing is the only method for a user using Data Terminating Equipment (DTE) to establish a switch data call. This feature allows users to dial data calls to multi-host sites and activate features such as Speed Calling, Auto Dialing, and Ring Again.

To activate keyboard dialing, users with the keyboard dialing option must set up the DTE as they normally would. KBD becomes inoperative as soon as a data connection is established and is reactivated once the data call is released.

To invoke autobaud or autoparity, the user types a period, followed by a carriage return. If the input is received successfully, autobauding is successful and the period is displayed on the screen. The software ignores any other characters until the user enters a period. The carriage return initializes the KBD and displays a menu on the screen. All characters are ignored until a carriage return is entered. The user then enters the desired menu selection and answers any further prompts to establish the connection. Prompts appear at each stage of the call set-up to aid the user. No calls can be originated or terminated until autobauding is completed.

During KBD dialing, the KBD function recognizes the XON(DC1) and XOFF(DC3) ASCII code from the terminal or DTE. Character output to the DTE is halted when XOFF is received. Output resumes when a subsequent XON is received.

KBD supports the following features and utilities:

- calling to a local or remote host
- Autodial
- Speed Calling
- Resource Call (Modem Pooling)
- Ring Again
- automatic answering of incoming calls
- updating of Autodial number and Speed Calling list
- setting and resetting the remote loopback status

BF0818
CADA KBD (continued)

- cancellation of pending Ring Again requests
- status and data query

User inputs

User inputs must conform to the following limitations:

- Input can be in upper or lower case, but the KBD echoes all inputs to the terminal in upper case.
- When KBD prompts for a number, the input cannot be in alphanumeric combinations as found on a standard dial pad.
- Invalid input results in a prompt to re-enter the information.
- The delete key deletes the whole input line. It is echoed to the terminal as a carriage return and line feed so the user can re-enter the information on a new line.
- A maximum of 24 characters is allowed before a carriage return.
- The user can abort any KBD function by pressing the Control and Z keys simultaneously.
- Only one menu selection on a line is allowed. If the user attempts to enter more than one menu selection on a line, the MADO unit responds with a Bell character and a backspace.

KBD prompt messages

The following characteristics apply to all prompt messages that the KBD displays:

- All prompts are in upper case.
- A line feed precedes all prompts.
- A colon follows prompts that wait for user input.
- Other prompts are terminated by a carriage return and line feed.

Call disconnection

During call setup, the user can press the Control and Z keys simultaneously to abort a call attempt. This aborts the current KBD function. After a call is set up and KBD is no longer functioning, drop the connection with one of the following methods:

- user logoff from the host and the host DTE
- any action that causes the Data Terminal Ready control lead from the DTE to go low (for example, placing the DTE in offline mode or turning the power off)

BF0818**CADA KBD** (continued)

- power going off in the DTE interfacing unit
- keyboard input that consists of a one second delay, followed by three exclamation points with less than one second delay between each, followed by a one second delay.

Note: Some features are subscriber options. Attempts to activate unsubscribed options result in an error message.

KBD Features Operation

This section details the operation of the KBD features.

Call operation

The following table shows call operation for local and remote calls.

Call operation

Step	User Input	Screen Display	Comments
1	NNNN (CR)	CONNECTION IN PROGRESS	Main menu is displayed.
2			User keys in the DN
3			MSL-100 software rings a local set or terminates on an outgoing trunk
4			Data call established, session starts.

Resource call operation

Because the MSL-100 has no automatic insertion of the modem pool, the user must enter M (modem pool) until the far end modem answers the call. See the following table.

Resource call operation (Sheet 1 of 2)

Step	User Input	Screen Display	Comments
1	R (CR)	TYPE PREFIX THEN PRESS RETURN	Main Menu is displayed.
2			
3			

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CADA KBD (continued)

Resource call operation (Sheet 2 of 2)

Step	User Input	Screen Display	Comments
4	PP (CR)		"PP" is the MP feature activation code.
5		MODEM RESERVED TYPE NUMBER THEN PRESS RETURN	Modem pool member has been reserved but not connected.
6	NNNN (CR)		User keys in the DN.
7			Data call established, session starts.

Ring Again activation

The following table illustrates Ring Again activation when a call begins but the local destination is busy. Ring Again cannot be activated on remote calls or modem pools.

Ring Again activation

Step	User Input	Screen Display	Comments
1		BUSY, DO YOU WISH TO RING AGAIN? TYPE Y/N or BUSY, PREVIOUS RING AGAIN ACTIVE, REPLACE? TYPE Y/N	Destination busy Informs the user that there is already a Ring Again active.
2	Y (CR) or (CR)	RING AGAIN PLACED CALL RELEASED or CALL RELEASED	Activates RAG. Aborts call attempt. Invalid request. Aborts call attempt
3			Main Menu is displayed.

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Ring Again recall

The following table illustrates the steps in Ring Again recall operation.

Ring Again recall

Step	User Input	Screen Display	Comments
1		DATA STATION NOW AVAILABLE, PLACE CALL? TYPE Y/N	Both stations idle and RAG is pending. A Bell character is also sent to the terminal to alert the user.
2	Y (CR)		
3		CONNECTION IN PROGRESS	The MSL-100 rings a local set.
4		CALL IS CONNECTED, SESSION STARTS.	Data call established.

Cancel Ring Again

The following table shows the steps to cancel a pending Ring Again request.

Canceling a Ring Again request

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	M (CR)		Modify Menu is displayed.
3	C (CR)	RING AGAIN CANCELLED	
4			Modify Menu is displayed.

Autodial Activation

The steps for activating Autodial are shown in the following table. Autodial is compatible with modem pooling.

Autodial activation (Sheet 1 of 2)

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	A (CR)		

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CADA KBD (continued)

Autodial activation (Sheet 2 of 2)

Step	User Input	Screen Display	Comments
3		CONNECTION IN PROGRESS	The MSL-100 is ringing a local set or terminated on an outgoing trunk.
4		CALL IS CONNECTED, SESSION STARTS.	Data call is established.

Autodial number update

The steps for updating an Autodial number are shown in the following table.

Autodial number update

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	M (CR)		Modify Menu is displayed.
3	A (CR)	TYPE AUTO DIAL NUMBER THEN PRESS RETURN	
4	NNNN (cr)		DN number for Autodial.
5			Modify Menu is displayed.

Speed Call activation

The following table illustrates the steps in activating Speed Calling. Speed Calling is compatible with modem pooling

Speed Call activation (Sheet 1 of 2)

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	S (CR)	TYPE ACCESS CODE THEN PRESS RETURN	
3	AA (CR)		User inputs one- or two-digit access code.

BF0818**CADA KBD** (continued)

Speed Call activation (Sheet 2 of 2)

Step	User Input	Screen Display	Comments
4		CONNECTION IN PROGRESS	MSL-100 rings a local set or terminates on an outgoing trunk.
5		CALL IS CONNECTED, SESSION STARTS.	Data call established.

Speed Call list update

The following table illustrates the steps in updating a Speed Calling list.

Speed Call list update

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	M (CR)		Modify Menu is displayed.
3	S (CR)	TYPE ACCESS CODE THEN PRESS RETURN	
4	AA (CR)		User inputs one- or two-digit access code.
5		TYPE SPEED NUMBER THEN PRESS RETURN	
6	NNNNN (CR)		User types in DN for Speed Calling.
7			Modify Menu is displayed.

Setting and Resetting Remote Loopback Operation

Remote loopback provides a method for verifying the integrity of the data and signaling channels of the data loop facility. When the user activates Remote Loopback, the user's data loops around at the called MADDO unit's RS-232 interface back to the user's DTE. Loopbacks are made over digital trunks but cannot be used with modem pooling. The feature must be activated before the

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CADA KBD (continued)

data call is placed. The following table illustrates the steps in setting and resetting remote loopback operations.

Setting and Resetting Remote Loopback Operations

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	M (CR)		Modify Menu is displayed.
3	R (CR)	REMOTE LOOPBACK? TYPE Y/N	
4	Y (CR)		RLB set
5	N (CR)		RLB clear
6			Modify Menu is displayed.

Status Display Operation

When the user enters the command D (CR) at the Main Menu, the MADO unit displays information about the terminal's parameters. The following table illustrates the steps in the Status Display operation.

Status Display Operation

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	D (CR)	BAUD RATE: rrrrREMOTE LOOPBACK: Y/NAUTO ANSWER: Y/NRING AGAIN NUMBER: nnnn/NONE	
3			Modify Menu is displayed.

BF0818**CADA KBD** (continued)**Answer Mode Update**

The following table lists the steps in updating the answer mode.

Answer Mode Update

Step	User Input	Screen Display	Comments
1			Main Menu is displayed.
2	M (CR)		Modify Menu is displayed.
3	M (CR)	MANUAL ANSWER? Y/N	
4	Y (CR) or N (CR)		Sets manual answer mode. Sets auto answer mode.
5			Modify Menu is displayed.

Manual Answer Operation

The following table lists the steps for manual answer operation.

Manual Answer Operation

Step	User Update	Screen Display	Comments
1		INCOMING CALL ANSWER? TYPE Y/N	A Bell character is sent to the terminal. A carriage return is interpreted as a "YES" reply.
2		INCOMING CALL CONNECTED, or UNDER TEST	Incoming goes to DTE, synchronization is achieved. Given if the calling party requests the MADO unit to loopback the data. Auto-answered when testing.
3		INCOMPATIBLE INCOMING CALL. CALL RELEASED.	Incoming call to DTE, connection failed due to parameter mismatch.
4			A Bell character is sent to the terminal to alert the user.

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CADA KBD (continued)

Auto Answer Operation

DTE units employing KBD are normally set up for auto-answering incoming calls. The following table lists the steps for auto answer operation.

Auto Answer Operation

Step	User Input	Screen Display	Comments
1		INCOMING CALL CONNECTED or UNDER TEST	Incoming call to DTE, synchronization is achieved. A Bell character is sent to the terminal to alert the user. Given if the calling party requests the MADO unit to loop back the data.
2		INCOMPATIBLE INCOMING CALL . CALL RELEASED .	Incoming call to DTE, connection failed due to parameter mismatch.
3			A Bell character is sent to the terminal to alert the user.

Hardware requirements

The following hardware is required:

- Meridian Digital Line Module
- Meridian Digital Port Card
- Meridian M2000 Series Digital Set
- Meridian Asynchronous Data Option (MADO) card

Limitations and restrictions

The following limitations and restrictions apply to CADA KBD:

- The default NRS feature to activate outbound modem pooling cannot be assigned to the user. Assign only the Prefix NRS.
- This feature does not include the Expensive Route Warning (ERW) feature.
- Incoming calls are allowed while the user is editing a DN. When the user enters a CR to answer the incoming call, the digits that were meant for an outgoing call are ignored. When not answering the incoming call, the user must enter the DN digits after the calling party releases the present call.

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CADA KBD (end)

Interactions

The feature interactions are the same as for the Datapath KBD feature.

Datafill

One new customer (logical) table, table IVDINV, is required to support the Meridian sets. Table IVDINV is a new table implemented in new table control. It contains Meridian set configuration information. This table can be datafilled at any time after the LNINV table is datafilled. There are no default tuples to be entered. This table is to be dumped and restored.

There are four input tuple formats for this table, one for each of the three different Meridian voice sets and one for the data adapter (CADA). The SET_TYPE field defines the type of set. To define the set type, enter one of the following in the SET_TYPE field as appropriate:

- M2009 for Meridian M2009 sets
- M2112 for Meridian M2112 sets
- M2018 for Meridian M2018 sets
- CADA for a Compact Asynchronous Data Adapter

Service Orders

CADA KBD does not affect SERVORD.

Operational measurements

CADA KBD does not affect operational measurements.

Logs

CADA KBD does not affect logs.

User interface

CADA KBD does not change the user interface.

Billing

CADA KBD does not affect billing.

BF0828
DLM-PSTS firmware

Functionality name

DLM-PSTS Firmware

Description

This feature provides the control of signaling between the 6X51 and IVD (Integrated Voice and Data) sets equipped with the Meridian Asynchronous Data Option (MADO). The signaling consists of messages for call processing and data processing.

The Digital Signal Interface Processor (DSIP 8X49) is a controller card in the Digital Line Module (DLM). This card, along with the 8X46 Parallel Serial Time Switch (PSTS) provides an interface between the 6X51 and the port cards. Together the DSIP and PSTS (referred to here simply as the DSIP) handle the RCON (Receive Control) and TCON (Transmit Control) signals on ten separate lines. The DSIP converts messages between the X12 format signals and the Meridian Digital station sets. The DSIP also performs the time and space switching functions to convert the DS30A signals into the DS30X signals that the X11 chips on the port card and the X12 chip in the IVD set use. Functionally, the DSIP replaces the bus interface cards. The firmware and an on-board microprocessor control the DSIP card. The firmware resides in on-board ROMs and is initiated by a power-on reset or software reset. All tasks are interrupt-driven and self-scheduling.

DLM configuration

The DLM has Digital Port Cards (DPCs) instead of the line drawers that were in the Line Concentrating Module (LCM). The DLM shelf is divided into two units containing five Digital Port Cards (DPCs) each. Each unit contains a 6X51. Physically, both units are side-by-side on the same DLM shelf. There are ten RCON and ten TCON lines from each of the two 6X51s. Of these, five are used under normal circumstances. The other five are used only in "takeover" mode. Each DPC can have up to 16 Meridian sets (32 channels) connected to it. Each RCON carries messages destined for one DPC and one of 32 channels on that DPC. The following figure illustrates the DLM configuration.

BF0828**DLM-PSTS firmware** (continued)

320 locations, 160 per unit. The address of each location corresponds to a DS30A channel number (0 through 319). The contents of the locations are the DS30X channel number (0 through 319). On initialization, the memory is loaded with the value 511 (hexadecimal 1FF), which implies an idle channel. Data reads from the connection memory can only be performed in intervals of up to 125 microseconds. The read is performed in synchronization with the data transfer out of the data memory. The DSIP has the capability of hardware enabling and disabling messages from a specific channel or set. As well as providing the contents of connection memory for a specific channel in response to an RCON connection memory read message, the TCON response also indicates the status of the line, whether the hardware is enabled or disabled, and whether it is currently being looped back or not.

RCON messages

There is only one RCON message active on any one RCON line at any one time. The 24 bit-wide RCON message is latched upon reception. The RCON message contains the RCON line number field (four bits) that is supplied by the start bit detection hardware and the message field (20 bits). The most significant bits are the line numbers and bits 19 through 0 are the message bits.

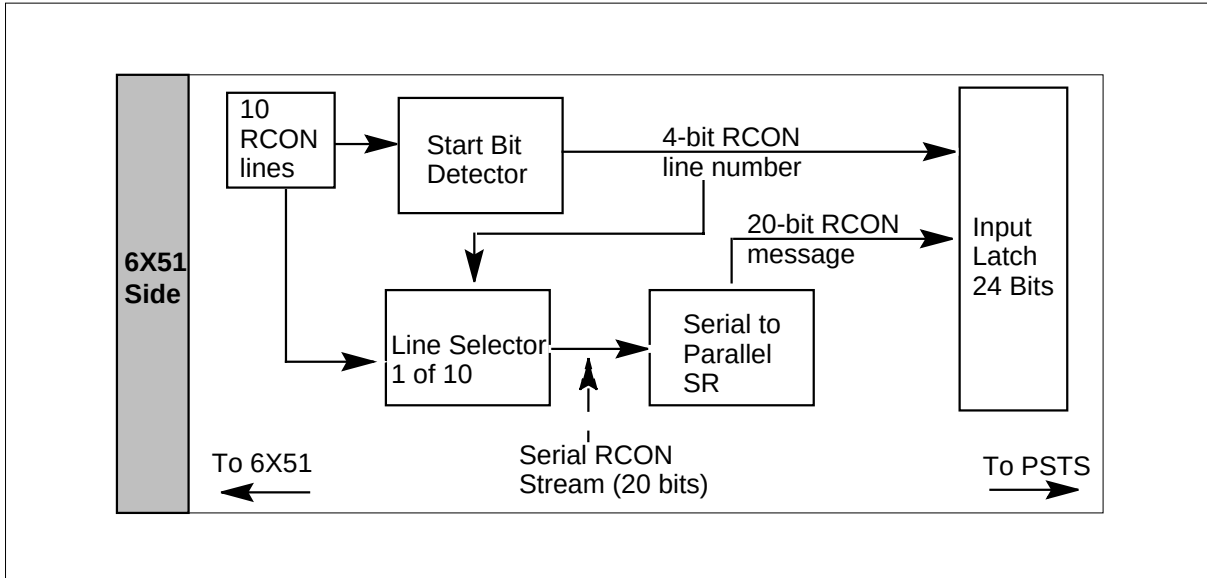
Output FIFO on the DSIP

All messages destined for the 6X51 are put into an output FIFO with the exception of inhibit read responses and connection memory read responses. The output FIFO is 24 bits wide and contains the TCON line number field (4 bits), which carries the TCON line number supplied by the microprocessor, and the actual message (20 bits). The most significant four bits (bits 20 through 23) contain the TCON line number. Bits 0 through 19 contain the 20-bit message with the start bit in position 19. See the following figures.

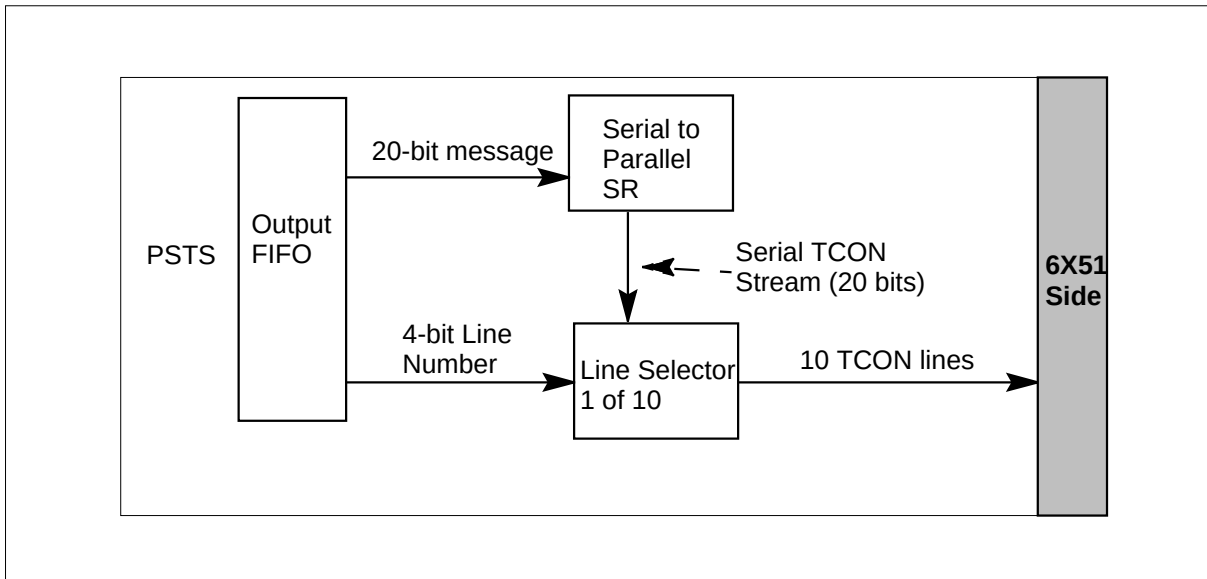
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DLM-PSTS firmware (continued)

RCON processing



TCON processing



Messaging to and from IVD sets

Messages from the 6X51 come to the DSIP over the RCON lines. The messages meant for the IVD sets are sent by the 6X51 to the DSIP as two successive transfers of 24 bits each. The address portion of the two messages

BF0828**DLM-PSTS firmware** (continued)

are the same. The data portion of each message contains 1 byte of the 16-bit message. The first message contains the most significant byte and the last one contains the least significant byte. The s0 bit is set to 1 in the first message to indicate the start of a message. The s0 bit is set to 0 in the second message transfer.

The microprocessor sends messages to the IVD sets. The microprocessor writes the message data (including the flow control bits) to a specific DS30X channel address. The DSIP uses the DS30A channel number from the RCON message to look up the copy connection memory and read out the corresponding DS30X channel number. The message data is then written to this DS30X channel address. The message also contains two flow control bits. The flow control bit selects one of two choices. The first flow control bit controls the Pulse Control Module (PCM) back from the set and the second bit controls the messaging back from the set. If the flow control bit is set, that function is inhibited. Otherwise, the function is enabled. The TCM message stream is constructed so that the flow control bits are always the last two message bits in any superframe. Each signaling packet is made of of six raw message bits and two flow control bits, until all message bits are exhausted. Filler bits are then inserted to pad the message to fit a super frame boundary. The last two bits are always the flow control bits.

The X12 sends both KEY UP and KEY DOWN messages. The LGC can request suppression of these messages by sending the MASK KEYBOARD ON message. Because the Line Group Controller (LGC) does not require the key up in normal operation, the default is KEY UP SUPPRESSED. The DSIP discards all other key up messages when in this state.

During set ringing, the DSIP sends messages from the ringing IVD set to the PP. These messages include the HOOKSWITCH UP message. The DSIP controls the cadencing using the TONE ON and TONE OFF control messages to the set.

The Ringing Cadence Table contains 12-bit values where each bit corresponds to a one-half second interval. This table contains an entry for each set if the bit is a one. The TONE ON message is sent to the set for a half second unless it is already on. If the bit is zero, a TONE OFF message is sent to the set unless it is already off. The 12 bits provide a cadencing pattern in this manner for six seconds. The DSIP repeats this pattern until the LGC sends a STOP RINGING message. When a set is not being cadenced, its Ringing Cadence Table entry is zeros. The LGC sends a cadence pattern in a special set control message when ringing the set. The set ringing is done using the TONE ON and TONE OFF. The cadencing for this is controlled by the DSIP. The LGC message

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DLM-PSTS firmware (continued)

SET_RING OFF triggers the ringing cadencing routines in the DSIP to accomplish this. When the DSIP receives the SET_RING OFF message, it clears the Ringing Cadence Table entry for the set and sends a TONE OFF message to the set.

Messages destined for the IVD sets are first received on the RCON and formatted by the Message Processor Task into messages that the X12 recognizes. The messages from the PP are received in a message unit. A message unit is one 24-bit RCON message. These messages are assembled into 20-bit message units containing 16 bits of actual message and 8 bits of message header. The DSIP receives the 16 bits of message in 2 RCON message units.

Signaling message to the X12

The DSIP sends one bit of the signaling message to the Meridian set every 125 microseconds. This bit is inserted into the least significant bit of the 10-bit PCM that is sent to the X11 on the port card.

Facility Maintenance

Looparound tests are available to test the subscriber loop and the M2000 set, as well as signaling at the DPC. In addition, message channel looparound and PCM channel looparound are available on the DSIP. The message channel looparound is available both on the processor side and on the set of the DSIP and the PCM. Channel looparound is done on the station set side of the DSIP. This permits most of the PCM hardware to be included in the looparound test. The 6X51 initiates the following facility maintenance tests:

- TCM looparound on. The 6X51 sends a LOOP TCM ON message to the X12 chip in the station. In response to this message, the transmit signaling interface in the station set loops back the voice signaling and control bits.
- TCM looparound off. The 6X51 sends a LOOP TCM OFF message to the X12 in the station set. This message turns off the TCM looparound mode.
- CODEC looparound on. The 6X51 sends a LOOP CODEC ON message to the X12 in the station set. In response to this message the analog signal is looped back from the receive pin (RC) of the CODEC (W05) to the transmit pin (XI) of the CODEC using the CODEC's AUXI path. The PCM voice can be looped back in this manner to the 6X51 through the PSTS.
- CODEC looparound off. The 6X51 sends a LOOP CODEC OFF message to the X12 in the station set to turn off the CODEC looparound mode. In response to this message, the CODEC looparound is turned off.

BF0828**DLM-PSTS firmware** (continued)

- DSIP PCM and signaling looparound. The 6X51 sends this message to the DSIP in order to loop around both the PCM channel and the signaling channel on the peripheral side of the PSTS card. This looparound can only be done on one channel at a time.
- PSTS message looparound. This is an automatic looparound. It is performed each time a RCON message is sent that does not require a response.

Firmware architecture

The firmware's main function is to perform set processing, RCON processing, set cadencing, and maintenance functions. Because of the architecture of this feature, all events are interrupt-driven. Some events are capable of interrupting other events, and some events are capable of interrupting at the end of the current event. Because all events are interrupt-driven, the background task monitors all sets for a change in state. The interrupt level structure for call processing is as follows:

- Set interrupt—set message has arrived.
- RCON interrupt—RCN message is loaded from the RCON latch and put in the buffer for later processing.
- 14.X MSEC interrupt—clears the Message Sent table to ensure proper amount of time has passed between sending consecutive messages to the same set. It also processes ALL LAMP FLASH, ALL LAMP ON, and ALL LAMP OFF messages.
- 7.X MSEC interrupt—used for sending bulk data transfer to data adapters.
- 4 MSEC interrupt—enabled when there are format messages to be sent to a set that requires transmission of the final byte of the message immediately following the initial transfer.

Set processing

Set processing includes the processing of message from all sets including the data adapters. The processing function consists of converting the received set message and formatting them into a TCON format for transfer to the 6X51. Typical message consists of dial digits, function keys, and PCM data transfers. This firmware also monitors the incoming message to determine if any messages require an immediate response.

BF0828

DLM-PSTS firmware (continued)

RCON Processing

RCON processing is similar to set processing except that messages are from the 6X51. This class of message consists of the following types of messages:

- messages destined for the set, which require a straight translation to the X12 format
- messages for the DSIP, which are normally initialization messages
- function test requests or messages requiring DSIP interception, such as profile store for the data adapter, connect memory read requests, and connect memory write

Cadence control task

This task is responsible for maintaining the ringing cadence to each set when the call processing software issues a command to ring a set. It issues a series of TONE ON and TONE OFF messages to the set. The selection of the TONE ON or TONE OFF is dictated by the value of the bit in the cadence pattern. The cadence pattern is obtained from the Ringing Cadence Table. The Set Ring On message from the LGC carries an index into this table. A 12-bit cadencing pattern is circulated every 6 seconds (1 bit every half second.) The SET RING OFF message from the LGC terminates the ringing process.

Hardware requirements

DLM-PSTS Firmware has no hardware requirements.

Limitations and restrictions

DLM-PSTS Firmware has no limitations or restrictions.

Interactions

DLM-PSTS Firmware has no functionality interactions.

Datafill

DLM-PSTS Firmware does not affect data schema tables or office parameters.

Service Orders

DLM-PSTS Firmware does not affect SERVORD.

Operational measurements

DLM-PSTS Firmware does not affect operational measurements.

Logs

DLM-PSTS Firmware does not affect logs.

BF0828

DLM-PSTS firmware (end)

User interface

DLM-PSTS Firmware does not change the user interface.

Billing

DLM-PSTS Firmware does not affect billing.

BV2056

IVD BAD port administration

Functionality name

IVD BAD Port Administration

Description

This feature provides a low-impact alternative to replacing an entire card with only one defective port by preventing a bad port on an Interactive Voice and Data Port Card (IVDPC) from being assigned. When a bad port is detected, the port's entries for both the voice line and the data line are deleted from table IVDIND. The LEN of the line of the bad port is entered into the new table IVDTRBL. The only field contained in the logical tuple for this table is the Line Equipment Number (LEN), which is the key field.

The existence of a LEN in table IVDTRBL indicates that the corresponding port has been flagged as a bad port. In this case, neither of the LENs associated with that port can be datafilled in table IVDINV. When the LENs associated with a given port do not exist in table IVDTRBL, both of the LENs can be datafilled in table IVDINV. Whenever the problem with a bad port is remedied by replacing the port card, the tuples for the port in table IVDTRBL are deleted. This removes the trouble flag and enables the corresponding LENs in table IVDINV to be datafilled.

If the craftsperson attempts to add a tuple to tables IVDTRBL or IVDINV for a port for which a tuple still exists in the other table, an error message is issued and the update is rejected.

Hardware requirements

The Meridian sets must be connected to the Digital Line Module (DLM) with the IVDPC. The DLM must also be equipped with a Parallel Space Time Switch (PSTS).

Limitations and restrictions

IVD BAD Port Administration has no limitations or restrictions.

Interactions

IVD BAD Port Administration has no functionality interactions.

Datafill

Table IVDTRBL is a new customer logical table implemented in new table control. The module that contains the table control data aspects is module IVDBPTCI, which is in the optional subsystem IVDSUB. Datafill this table

BV2056**IVD BAD port administration (end)**

at any time after the LNINV table is datafilled. There are no default tuples to be entered.

Memory for this table is allocated dynamically and therefore table size is increased automatically as more tuples are input. Similarly, memory previously occupied by deleted tuples is reused before extending the table.

Service Orders

IVD BAD Port Administration does not affect SERVORD.

Operational measurements

IVD BAD Port Administration does not affect operational measurements.

Logs

IVD BAD Port Administration does not affect logs.

User interface

IVD BAD Port Administration does not change the user interface.

Billing

IVD BAD Port Administration does not affect billing.

A59006982

Real-time SMDR over EIU

Functionality name

Real-time SMDR over EIU

Description

Station message detail recording (SMDR) data must transfer from the MSL-100 system to the billing server in order to bill for features. This feature, Real-time SMDR over EIU, transfers SMDR data from the MSL-100 system computing module (CM) to a billing server. SMDR data is sent over an Ethernet interface unit (EIU) using transmission control protocol/internet protocol (TCP/IP).

This feature has the following requirements:

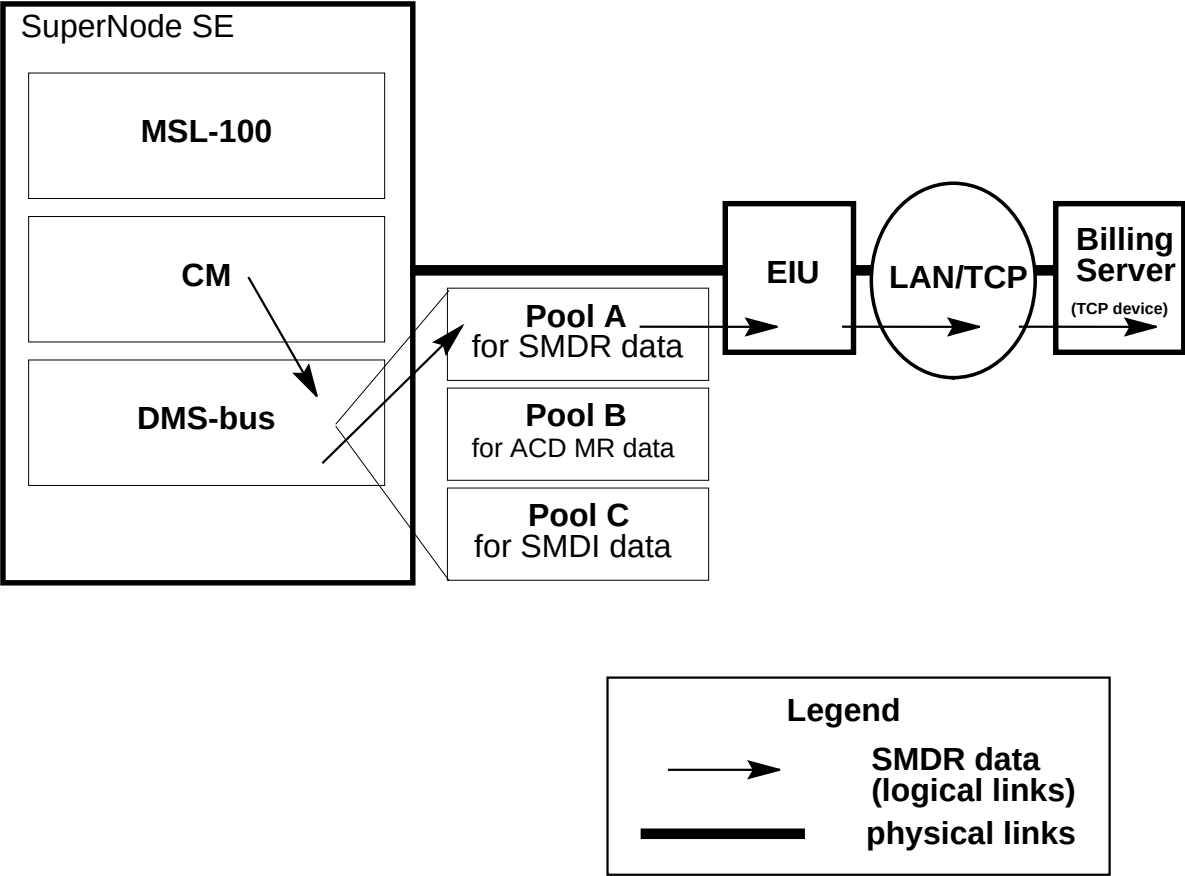
- a billing server that is configured as a TCP device
- a logical connection from the CM to the TCP device

The following figure shows the flow of the SMDR data from the MSL-100 switch computing module (CM), to a repository in the DMS Bus, through an EIU and LAN connection, to the billing server.

A59006982

Real-time SMDR over EIU (continued)

SMDR data transfer to billing server over EIU



The following sections describe how to create a logical connection to the TCP device and how to disconnect the TCP device.

A59006982

Real-time SMDR over EIU (continued)

Create a logical connection to the TCP device

To create a logical connection between the TCP device and the CM, use the following procedure.

1. Enter LNKUTIL at the CI prompt. An example of the command is as follows:

```
1999/01/13 01:26 LOG MESSAGE IS NOT SET
```

```
CI:
```

```
>lnkutil
```

```
LNKUTIL:
```

```
>
```

2. Execute the DEVCON command at the LNKUTIL prompt. An example of the command is as follows:

```
>DEVCON <device name> [<datalink poolname>]
```

The TCP device links to the available pool. If no pool is available, and no pool name is specified, a pool with the same name as the device name is created. If a pool name is specified by the user, this name is assigned to the pool, if exists. Otherwise, the specified name is assigned to the newly created pool.

3. Execute the POOLSTART/DEVSTART command at the LNKUTIL prompt. An example of the command is as follows:

```
>POOLSTART <datalink poolname> SMDRRPT
```

```
or
```

```
>DEVSTART <device name> SMDRRPT
```

The SMDR data starts transferring from the pool name specified to the connected billing server.

4. Go to the SMDRLNK prompt by entering SMDRLNK. An example of the command is as follows:

```
1999/01/13 01:26 LOG MESSAGE IS NOT SET
```

```
LNKUTIL:
```

```
>smdrlnk
```

A59006982**Real-time SMDR over EIU (continued)****SMDRLNK:**

5. Execute the SENDSMDR command at the SMDRLNK prompt. An example of the command is as follows:

```
>SENDSMDR <datalink poolname>
```

The TCP device is connected and routes the SMDR data to the specified pool.

Disconnecting the TCP device

To disconnect the logical connection of the TCP device from the CM, use the following procedure.

1. Execute the STOPSMDR command at the SMDRLNK prompt. An example of the command is as follows:

```
>STOPSMDR <datalink poolname>
```

The SMDR data stops transfer to the specified pool.

2. Execute the POOLSTOP/DEVSTOP command at the LNKUTIL prompt. An example of the command is as follows:

```
>POOLSTOP <poolname> SMDRRPT
```

or

```
>DEVSTOP <device name> SMDRRPT
```

This POOLSTOP command stops the transfer of SMDR data from the specified pool to the TCP device.

This DEVSTOP command stops the transfer of SMDR data to the TCP device.

3. Execute the DEVDISC command at the LNKUTIL prompt. An example of the command is as follows:

```
>DEVDISC <device name> [<kill>]
```

The TCP device is disconnected. The KILL option unassigns the TCP device from the specified pool.

Hardware requirements

This feature requires an EIU connected to the MSL-100 message switch (MS).

A59006982

Real-time SMDR over EIU (continued)

Limitations and restrictions

The following limitations and restrictions apply to Real-time SMDR over EIU:

- The data transmission is one-way and the switch side does not accept data.
- No security features are necessary.
- If the TCP connection goes down, the data transmission aborts and an SLLNKERR alarm (MAJOR) is raised.

Interactions

Real-time SMDR over EIU has no functionality interactions.

Datafill

Real-time SMDR over EIU does not affect office parameters.

This feature affects the data schema table SLLNKDEV. For detailed information on provisioning this feature, see the *Customer Data Schema Reference Manual*.

Service orders

Real-time SMDR over EIU does not affect SERVORD.

Operational measurements

Real-time SMDR over EIU affects the operational measurements group SLLNK and the following registers:

- SLLNKOVF—counts messages overwritten because of an attempt to queue when it is full. A full queue contains the maximum number of messages waiting for processing. Overwritten messages cannot be retrieved. SLLNK106 is also generated when a queue overflow occurs.
- SLLNKOK—counts messages successfully queued for transfer to the downstream processor
- SLLNKQU—counts messages in a queue for processing. The queue updates every 100 seconds.

A59006982**Real-time SMDR over EIU (end)**

Logs

Real-time SMDR over EIU generates the following logs for various events on the TCP device:

- SLNK100—created with each successful TCP connection, or execution of the DEVCON command
- SLNK101—created with each successful disconnect from the TCP device, or execution of DEVDISC command
- SLNK102—created every time the TCP device begins transferring data, or execution of POOLSTART/DEVSTART commands
- SLNK103—created every time the TCP device stops transferring data, or execution of POOLSTOP/DEVSTOP commands
- SLNK106—created every time remote operation (RO) did not queue a data link device in the last two minutes because of a full queue
- SLNK107—created when an MSL-100 link wakeup fails to restart a datalink for any reason after a restart or link failure

User interface

Real-time SMDR over EIU does not change the user interface.

Billing

Real-time SMDR over EIU does not affect billing.

A59006994

Music on Transfer

Functionality name

Music on Transfer

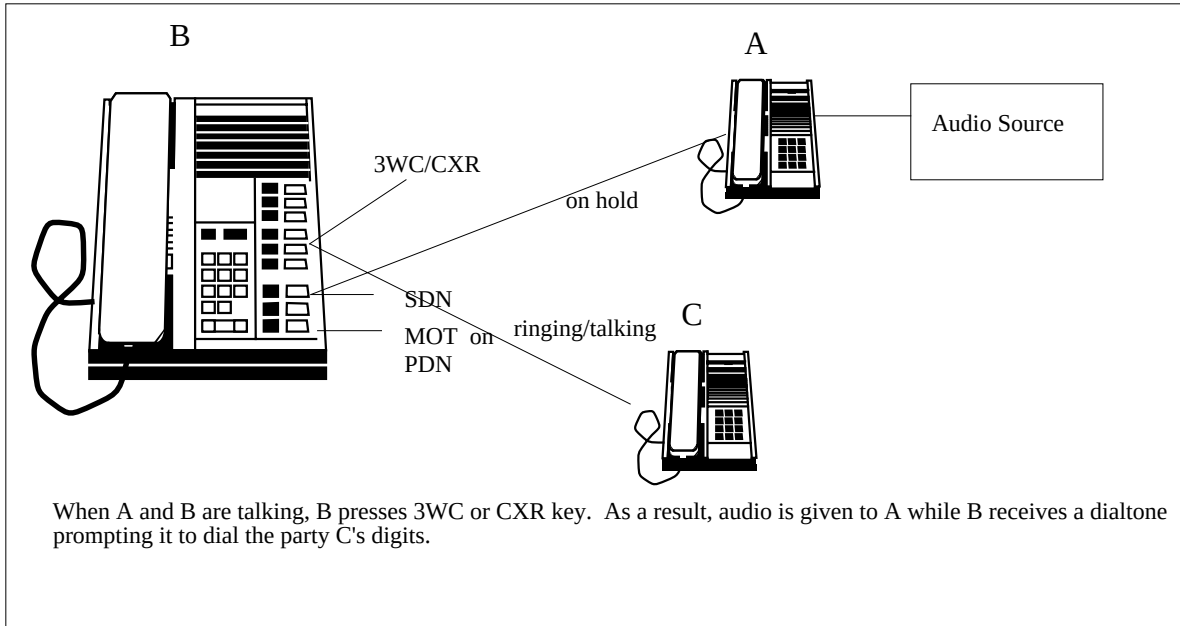
Description

The Music on Transfer (MOT) feature provides audio to the held party of a three-way call (3WC) or call transfer (CXR) when the conference or transfer is initiated.

When caller A is transferred or conferenced by caller B to caller C, caller A is connected to an audio source, such as music. When the call is completely transferred or conferenced, or the second leg is dropped by caller B, the call is re-established on the line and the audio source is terminated. The functionality is provisioned by assigning MOT through SERVORD, on a primary directory number (PDN).

MOT is different from feature key set music on hold (KSMOH). KSMOH is also available for a 3WC or CXR. With KSMOH, the held party does not hear music until the holding party completes the dialing sequence for the third party. The MOT feature provides audio immediately when the holding party begins the transfer process (presses the 3WC or CXR key, or the hook).

See the following diagram for an example of how MOT works.

A59006994**Music on Transfer (continued)****Example of MOT****Feature activation**

MOT supports integrated business network (IBN) sets, all line class codes (LCC) supported by key sets, and integrated voice and data (IVD) sets. Details for activation on these sets are explained in the following paragraphs.

The following section describes MOT feature functionality for IBN sets. See the Event flow diagram for IBN sets for more information.

IBN sets

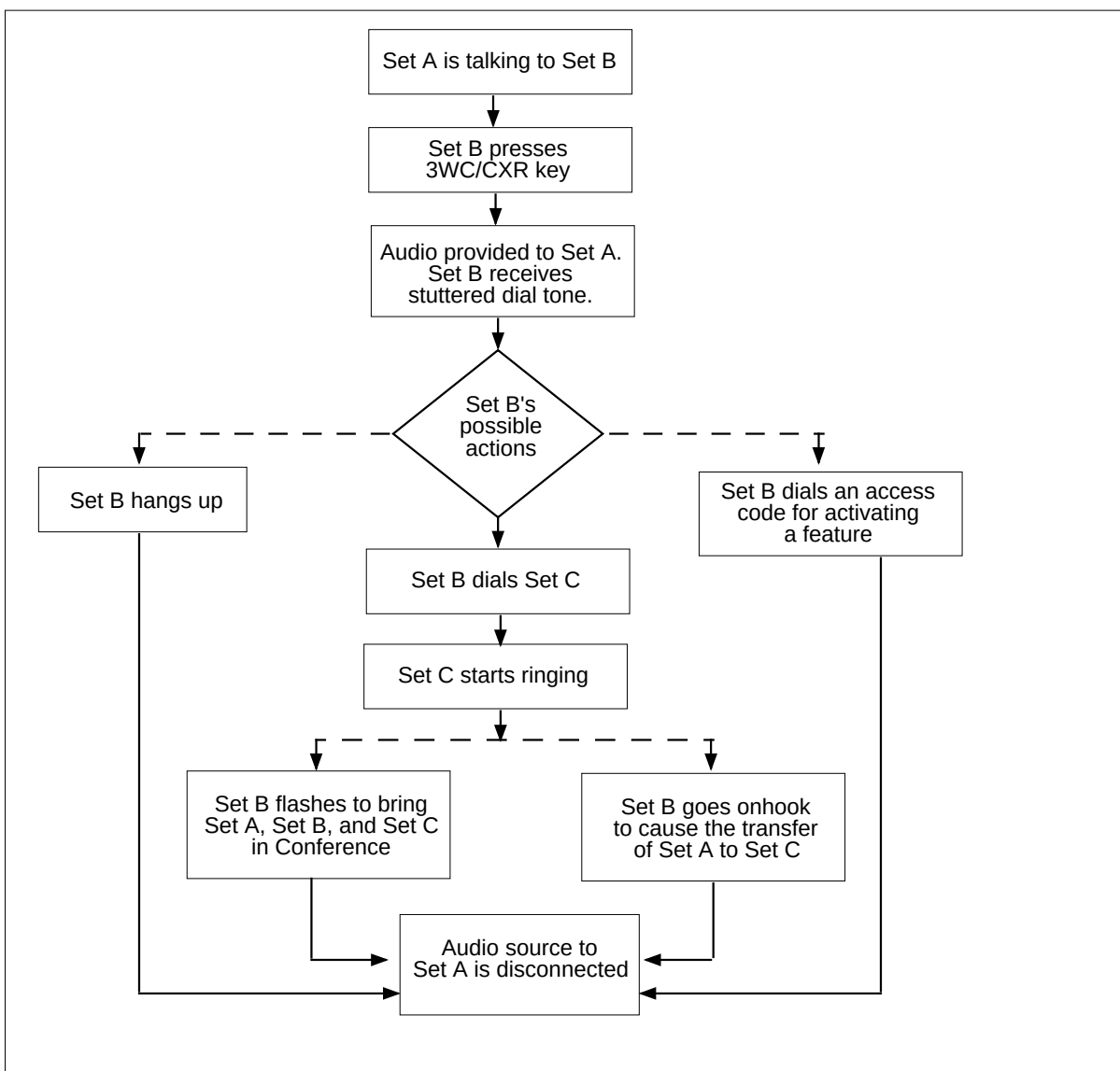
The following describes an example of how the MOT feature works for IBN sets.

1. A line-to-line call is established between two parties, Set A and Set B.
2. Set B, which has the MOT and 3WC or CXR options assigned, presses 3WC or CXR.
3. Set A is now on hold and receives audio source (defined in table AUDIO), while Set B gets a dial tone to dial the destination digits on the second leg of 3WC or CXR.
4. Once the call on the second leg of Set B is complete, Set B presses 3WC or CXR again to complete the conference, or hangs up to transfer the call, and the audio source to Set A is automatically stopped.

A59006994

Music on Transfer (continued)

Event flow for IBN sets



The following section describes MOT feature functionality for MBS and IVD sets. See the Event flow diagram for MBS and IVD sets for more information.

A59006994**Music on Transfer** (continued)

MBS and IVD sets

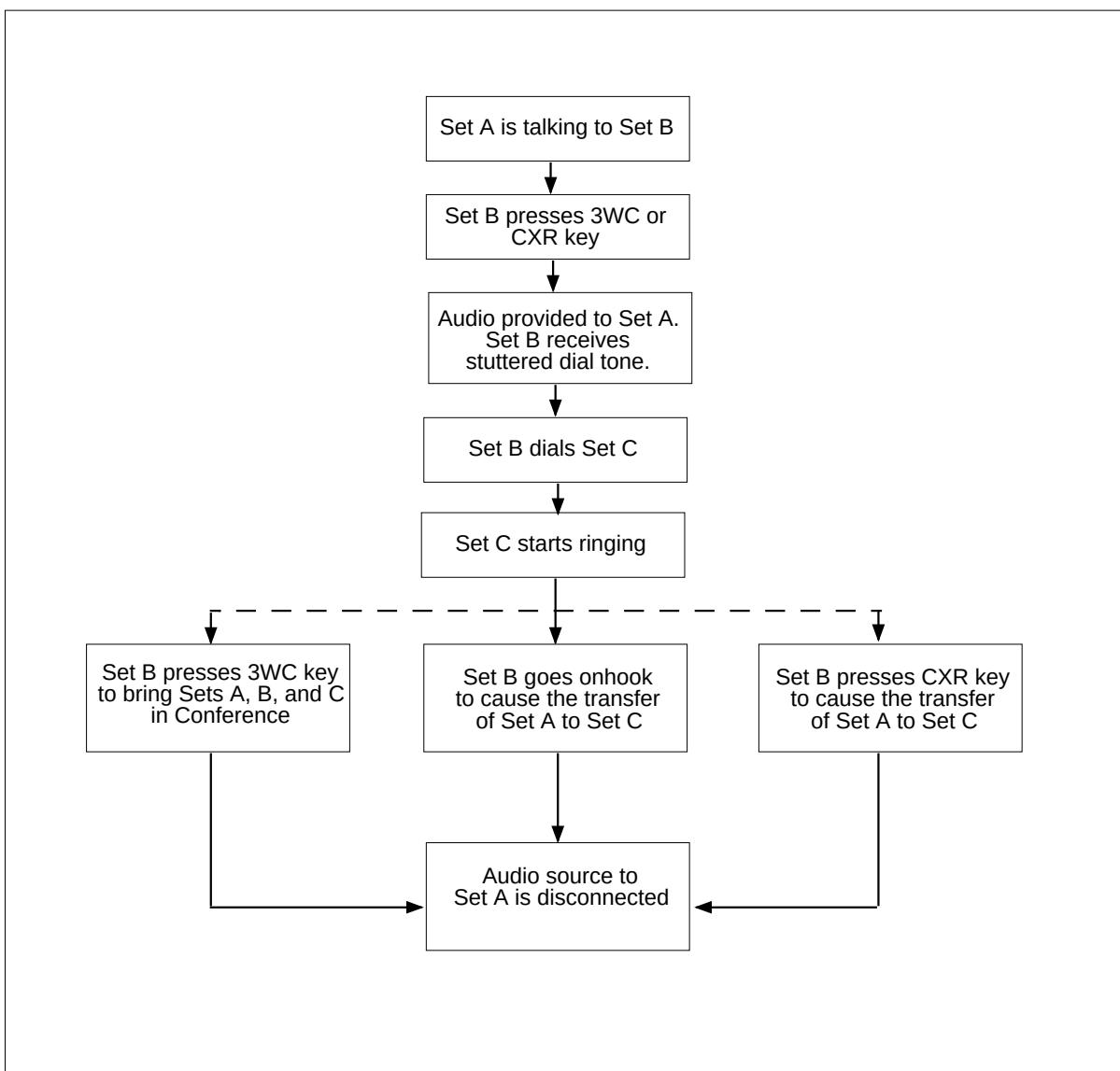
The following describes an example of how the MOT feature works for MBS and IVD sets.

1. A line-to-line call is established between two parties, Set A and Set B.
2. Set B's 3WC or CXR key is pressed to activate either a three-way call or call transfer. The MOT option is on the primary directory number (PDN). The features 3WC and CXR are on separate keys.
3. When Set B's 3WC or CXR key is pressed, Set A is placed on hold and receives the audio source (defined in table AUDIO). Set B receives a stuttered dial tone for the destination digits on the second leg.
4. Once the call on the second leg of Set B is complete, either the 3WC key is pressed to complete the conference, or the CXR key is pressed to transfer the call. Set B can also go on hook to cause the transfer. With any of these actions, the audio source to Set A is automatically stopped.

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Music on Transfer (continued)

Event flow for MBS and IVD sets



References

The following features provide information related to Music on Transfer.

- Feature AD0751, Key Set Music on Hold for P-Phones—Phase I
- Feature AD0904, Key Set Music on Hold for P-Phones—Phase II
- Feature AD0989, Key Set Music on Hold for P-Phones—Phase III

A59006994**Music on Transfer** (continued)

- Feature AF7806, Line Music on Hold for CCM
- Feature BC0946, Audio Interlude
- Feature AF6655, ISDN Music on Hold
- Feature AJ5124, Push Button Music on Hold

Hardware requirements

Music on Transfer has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Music on Transfer:

- This feature provides audio on three-way conference (3WC) or call transfer (CXR) for IBN, MBS, and IVD sets only. The same functionality is provided to ISDN sets by feature AF6655, which is a software optionality control (SOC) feature.
- The line must be in a customer group which is datafilled with the MOT option, and MOT's audio group must be datafilled in table CUSTSTN.
- The line must be in a MOT audio group which is datafilled with an audio route containing a valid audio source in table AUDIO.
- If a participant in a 3WC places a conference call on hold, audio will not be provided to the other conferees. If the holding party is a line agent, and is identified as a conference call, audio is not provided.

Interactions

Interactions between Music on Transfer and other functionalities are broken out between IBN sets and MBS/IVD sets. For all sets, the line must be in a customer group that has the option MOT, and 3WC or CXR assigned.

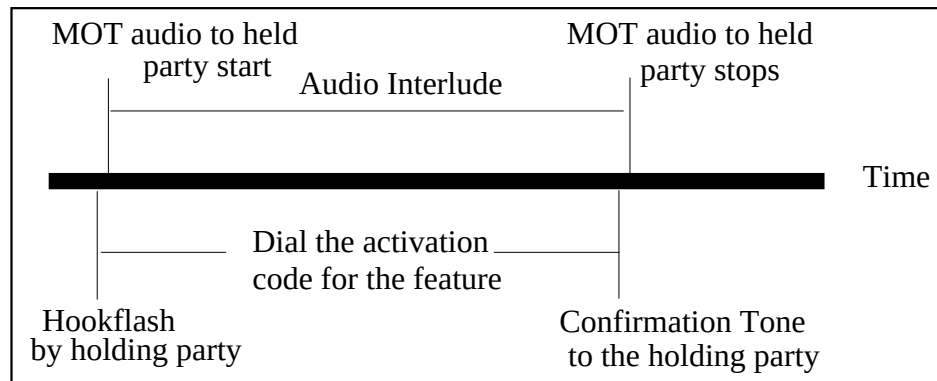
The following are MBS/IVD functionality interactions with MOT.

- call waiting (CWT)
- conference (CNF) call
- call hold (CHD)
- permanent hold (PHOLD)
- key set music on hold (KSMOH)

IBN sets have functionality interactions with MOT and flash activated features. See the following paragraph for details about the interactions.

A59006994**Music on Transfer (continued)****Flash activated feature interactions for IBN sets**

Audio is provided by MOT to the held party when the holding party quickly presses the hook (or flashes). The holding party may flash to activate other features (for example, Call Park). For activating any such feature, the holding party flashes and then dials the activation code for the feature. As a result of the flash, the held party, listens to audio provided by the MOT feature until the holding party completes dialing the activation code for that feature. See the following diagram for an example of how MOT works for IBN sets.

Flash interactions for IBN sets**Feature interactions with MOT for MBS/IVD sets**

The feature interactions with MOT for MBS/IVD sets are explained in the following paragraphs.

Call Waiting (CWT) feature interactions with MOT

When the user presses CWT to answer a waiting call, the holding call receives audio. If the user presses CWT again to put the active call on hold and returns to the original call, audio is removed from the first call and applied to the second call.

If a CWT user is put on hold and is receiving audio, and a waiting call is presented, the user hears the call waiting indicators (CWI) overlaid on the audio. That is, the held party hears: MUSIC ----- CWI ----- MUSIC ----- CWI ----- MUSIC ----- until the waiting call is answered or CWI times out.

If the CWT user goes on hook with a party on hold, the CWT user's phone set rings back with that call. The held party continues to receive audio while the CWT user's phone rings.

A59006994**Music on Transfer (continued)**

The caller on hold should hear audio regardless of whether the call is line-to-line or trunk-to-line.

Call waiting calls can be chained, so that if Set A and Set B are talking and both have CWT assigned to their lines, Set A can press CWT to answer a waiting call from some other caller, Set C, and Set B hears audio. Set B then receives a waiting call from Set D and presses CWT to answer it. If Set A presses RLS to go back to the original call, Set B now has Set A on hold and Set A hears audio.

Conference (CNF) call feature interactions with MOT

If a participant in a conference call (CNF) puts the conference on hold, the MOT feature does not provide audio to the other conferees. The same interaction applies to three-way conference calls (3WC).

Call hold (CHD) feature interactions with MOT

When a set's CHD key is pressed (to initiate call hold) the held party receives audio immediately, according to MOT's audio source. If the audio source of MOT is different from that of the CHD feature, then after the CHD access code is entered, MOT audio stops and CHD audio starts.

Permanent hold (PHOLD) feature interactions with MOT

When a set's PHOLD key is pressed (to initiate permanent hold), the held party receives audio immediately, according to MOT's audio source. If the audio source of MOT is different from that of the PHOLD feature, then after the PHOLD access code is entered, MOT audio stops and PHOLD audio starts.

Key set music on hold (KSMOH) feature interactions with MOT

If KSMOH is assigned on a line along with MOT, KSMOH does not provide audio for 3WC or CXR held calls, as it is already provided by MOT.

Datafill

Music on Transfer (MOT) does not affect office parameters.

This feature affects data schema tables CUSTSTN, AUDIO, IBNLINES, and KSETFEAT. Information on how tables CUSTSTN and AUDIO are affected is as follows. For more detailed information about the affected tables, refer to the *Customer Data Schema Reference Manual*.

Table CUSTSTN

For this feature to provide audio, the MOT option is datafilled in table CUSTSTN. The MOT's audio group is also assigned in this table. The AUDIOGRP field of the MOT option allows the customer to datafill the

A59006994

Music on Transfer (continued)

desired audio source. See the following diagram for a sample datafill for table CUSTSTN.

Table CUSTSTN sample datafill

TABLE: CUSTSTN		
>list		
CUSTNAME	OPTNAME	OPTION

CTXGRP1	MOT	MOT AUDIO512
>		

Table AUDIO

The MOT audio route lists are optionally assigned to the 512 allocated MOT audio groups in table AUDIO.

For each of the 512 allocated MOT audio groups (MOT AUDIO1 to MOT AUDIO512), an audio route list, containing up to four audio sources, is datafilled. See the following diagram for a sample datafill for table AUDIO.

Table AUDIO sample datafill

TABLE: AUDIO	
>list	
AUDIOKEY	ROUTES

AUDIO1 MOT	(ANN Y 2 NFRAANN) (RINGING 12) (MUSIC
AUTOAINANNC 12) (REPEAT 2) \$	
>	

Service orders

Music on Transfer is provisioned on the set using SERVORD commands NEW and ADO. This option must be assigned on a PDN.

Operational measurements

Music on Transfer does not affect operational measurements.

A59006994
Music on Transfer (end)

Logs

Music on Transfer does not affect logs.

User interface

Music on Transfer does not change the user interface.

Billing

Music on Transfer does not affect billing.

A59007002

AAB Enhancement

Functionality name

Auto Answer Back (AAB) Enhancement

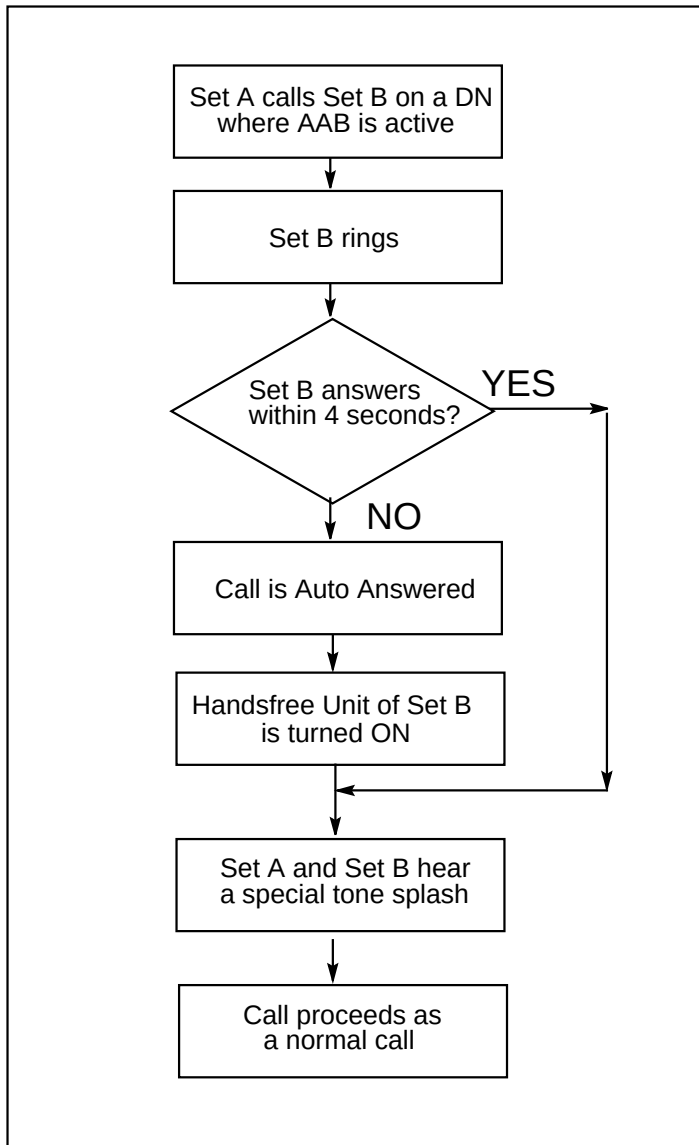
Description

The Auto Answer Back (AAB) Enhancement feature allows the AAB feature to work on secondary directory numbers (DN) and group intercoms (GIC).

AAB Enhancement supersedes the AAB feature. It works as follows. The user activates AAB for any DN. When a call is presented to a DN on the set for which AAB is active, the call is automatically answered after four seconds of ringing without any user intervention. The handsfree unit is turned on and a special tone splash is given to both the caller and the called party to indicate that AAB is active on the called party's set. This tone splash also indicates that the handsfree unit has been turned on. This enhancement works the same way for GIC (see note). References to the AAB feature from this point forward, include the AAB Enhancement functionality.

Note: The abbreviation, DN, from this point forward will refer to both DN and GIC.

See the following diagram for an example of how AAB Enhancement works.

A59007002**AAB Enhancement** (continued)**AAB activated call flow****Feature activation and deactivation**

AAB is assigned on a dedicated key. Use the following instructions for activation and deactivation of the feature. The set must be idle while performing the steps.

Feature activation

Use the following steps to activate the AAB feature on a dedicated key.

A59007002

AAB Enhancement (continued)

To activate AAB:

1. Press the feature key on which AAB is assigned. (The lamp next to the key flashes.)
2. Press the DN key or GIC key for which you want AAB activated. (The lamp lights solid.)

Feature deactivation

Use the following steps to deactivate the AAB feature on a dedicated key.

To deactivate AAB:

1. Press the feature key on which AAB is assigned. (The lamp next to the key flashes.)
2. Press the DN key or GIC key for which you want AAB deactivated. (The lamp goes off, unless there is at least one DN on the set for which AAB is still active.)

Feature verification

If the AAB key has a lamp turned on beside it, the user verifies if AAB is active for a DN on the set by pressing the DN key. If the user receives a stuttered dial tone, then AAB is active for that DN. If the user gets a normal dial tone, then AAB is inactive for that DN.

Hardware requirements

Auto Answer Back Enhancement has no hardware requirements.

Limitations and restrictions

The following limitations and restrictions apply to Auto Answer Back Enhancement:

- This feature can only be used with Handsfree capable key sets (KSET). See the Service Order Reference Manual for more information.
- When an incoming call to an integrated voice and data (IVD) set DN or a KSET DN is manually answered before four seconds of ringing (that is, before the AAB timer expires and the call is automatically answered) a tone splash is given.

Interactions

Auto Answer Back Enhancement has no functionality interactions.

A59007002
AAB Enhancement (end)

Datafill

Auto Answer Back Enhancement

- does not affect office parameters
- affects data schema tables KSETLINE and KSETFEAT

Service orders

Auto Answer Back Enhancement affects the ADO, NEW, CHF and DEO SERVORD commands. See the *Service Order Reference Manual* for more information.

Operational measurements

Auto Answer Back Enhancement does not affect operational measurements.

Logs

Auto Answer Back Enhancement does not affect logs.

User interface

Auto Answer Back Enhancement does not change the user interface.

Billing

Auto Answer Back Enhancement does not affect billing.

A59007055

Meridian Digital Telephone Flash Download

Functionality name

Meridian Digital Telephone Flash Download

Description

This feature implements the firmware Flash Download mechanism for the Meridian Digital Terminals M3900 series portfolio. This is accomplished through the Nortel Networks Optivity Telephony Manager for the Meridian SL-100 product.

Meridian Digital Telephone Flash Download (referred to as Flash Download from this point forward) downloads firmware from the switch to a M3900 series Meridian Digital Telephone in the following situations:

- support a new language
- add new text prompts and self-labels for features and soft keys
- add new firmware-based applications
- support new signaling messages for server-based applications
- fix customer-reported problems

This feature, using the Optivity Telephony Manager for Meridian SL-100:

- queries the current firmware version on a Meridian Digital (M3900 series) Telephone
- initiates Flash Downloads to a series of Meridian Digital (M3900 series) Telephones
- initiates scheduled Flash Download on Meridian Digital Terminals configured on intelligent peripheral equipment (IPE) with an enhanced extended peripheral equipment controller (EXPEC)
- tracks download progress, as well as manages the correlation of firmware files for the different terminals
- logs download failures

Note: All new firware must be tested on a non-critical phone prior to downloading to a range of DN numbers to ensure that the load is not corrupt. Refer to CAB 75689 for additional information.

A59007055**Meridian Digital Telephone Flash Download** (continued)

Accompanying features

The following features work in conjunction with this feature:

- A59007068, Meridian Digital Telephone DN Download
- A59007097, Meridian Digital Telephone Provisioning & Soft Key Configuration
- A59007106, Meridian Digital Telephone Key Based Access Expansion Module
- A59007115, Meridian Digital Telephone Display Based Access Expansion Module
- A59007124, Meridian Digital Telephone Group Listening & Password Protection

References

For more information, refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

Hardware requirements

Flash Download requires no hardware. However, Optivity Telephony Manager for Meridian SL-100 is recommended.

Meridian Digital Terminals require IPE with an EXPEC.

Limitations and restrictions

The following limitations and restrictions apply to Flash Download:

- Flash Download is not available if the Meridian Digital Telephone is active with a call.
- Meridian Digital Terminals are inoperable during the Flash Download process. The terminals display a message when a download is in progress. If a download fails, a message display indicates that maintenance is required.

Interactions

When IPE is equipped with EXPEC, and a M3900 series Meridian Digital Telephone and Meridian M2000 series coexist, the M2000 terminals continue to operate during the Flash Download process. Call processing traffic increases download time, and Flash Download processing increases call processing time.

A59007055

Meridian Digital Telephone Flash Download (end)

Datafill

Flash Download does not affect data schema tables or office parameters.

Service orders

Flash Download does not affect SERVORD.

Operational measurements

Flash Download does not affect operational measurements.

Logs

Flash Download does not affect logs.

User interface

Flash Download does not change the user interface.

Billing

Flash Download does not affect billing.

A59007068

Meridian Digital Telephone DN Download

Functionality name

Meridian Digital Telephone Directory Number (DN) Download

Description

The Meridian Digital Telephone M3900 series (except M3901) has a display area next to each key. This area displays the directory number (DN) associated with a line key or the feature assigned to a feature key, thus eliminating paper labels.

Meridian Digital Telephone DN Download (referred to as DN Download from this point forward) provides the M3900 series with the DN information for the display area. Contained within this information are the feature codes used to display the assigned feature to a key.

Accompanying features

The following features work in conjunction with DN Download:

- A59007055, Meridian Digital Telephone Flash Download
- A59007097, Meridian Digital Telephone Provisioning & Soft Key Configuration
- A59007106, Meridian Digital Telephone Key Based Access Expansion Module
- A59007115, Meridian Digital Telephone Display Based Access Expansion Module
- A59007124, Meridian Digital Telephone Group Listening & Password Protection

References

For more information, refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

Hardware requirements

Meridian Digital Telephone M3900 series requires digital line cards in intelligent peripheral equipment (IPE) with an enhanced extended peripheral equipment controller (EXPEC).

Limitations and restrictions

DN Download and feature key labeling is applicable to Meridian Digital Terminals equipped with a display. Therefore, M3902, M3903, M3904,

A59007068

Meridian Digital Telephone DN Download (end)

M3905, and the Display Based Access Expansion Module (DBA), uses this functionality, while the M3901 set does not.

The M3902 Meridian Digital Telephone feature keys are limited to seven characters.

The M3903, M3904, and M3905 Meridian Digital Telephone feature keys are limited to ten characters.

DNs contain seven digits or characters.

Interactions

DN Download has no functionality interactions.

Datafill

DN Download does not affect data schema tables or office parameters.

Service orders

DN Download does not affect SERVORD.

Operational measurements

DN Download does not affect operational measurements.

Logs

DN Download does not affect logs.

User interface

DN Download does not change the user interface.

Billing

DN Download does not affect billing.

A59007097

Meridian Digital Telephone Provsng. & Soft Key Config.

Functionality name

Meridian Digital Telephone Provisioning and Soft Key Configuration

Description

The purpose of these features, Meridian Digital Telephone Provisioning and Soft Key Configuration (referred to as Telephone Provisioning and Soft Key Configuration from this point forward) is to introduce the Meridian Digital Telephone M3900 series to the MSL-100 product market.

The following sections give brief characteristics of each model in the portfolio. For more detail, please refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

M3901 characteristics

The M3901 set is a single-line set with no display. It supports one directory number (DN) and five programmable features. This set also includes fixed keys for Line, Feature, Hold, Goodbye, and Volume Up/Down.

M3902 characteristics

The M3902 set is a single-line set with a two-line display. It supports one DN, three programmable feature keys that are self-labeled, and three fixed keys for Message, Transfer, and Options. Although the Message and Transfer keys are permanently labeled, they are not restricted to those features. This set includes fixed keys for Hold, Goodbye, Smart Mute with light emitting diode (LED), Volume Up/Down, Handsfree (with LED), and four Navigation keys (up, down, left, and right).

M3903 characteristics

The M3903 is a four-DN set with a three-line display. It supports four self-labeled line/feature keys and four keys to access context-sensitive soft keys. It has five fixed feature/application keys which are Options, Message, Call Log, Applications, and a Shift key used to page between two layers of line/feature keys. The Message key is permanently labeled as such, but is not restricted to that feature. The set includes fixed keys for Hold, Goodbye, Smart Mute (with LED), Volume Up/Down, Headset (with LED), Handsfree (with LED), and four Navigation keys (up, down, left, right). This set also has Copy and Quit keys for applications and features.

M3904 characteristics

The M3904 is a professional set with a five-line display. It supports six self-labeled programmable line/feature keys with a Shift key to page between two layers of feature keys, for a total of 12. This set includes four

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Meridian Digital Telephone Provsng. & Soft Key Config. (continued)

context-sensitive soft keys used to access features, and fixed keys for Hold, Goodbye, Smart Mute (with LED), Volume Up/Down, Headset (with LED), and Handsfree (with LED). There are four Navigation keys (up, down, left, right) and Copy and Quit keys for applications and features.

M3905 characteristics

The M3905 is an automatic call distribution (ACD) set that supports eight self-labeled programmable line/feature keys with a four-line display. This set has four context-sensitive soft keys used to access features. It has six fixed feature/application keys for ACD features Supervisor, Emergency, Not Ready, Make Busy, In Calls, and Headset. These keys are permanently labeled, but not restricted to those features. This set also has fixed keys for Hold, Goodbye, Smart Mute (with LED), Volume Up/Down, Headset (with LED), and Supervisor Observe (with LED). There are four Navigation keys (up, down, left, right) and Copy and Quit keys for applications and features.

Accompanying features

The following features work in conjunction with Telephone Provisioning and Soft Key Configuration:

- A59007055, Meridian Digital Telephone Flash Download
- A59007068, Meridian Digital Telephone DN Download
- A59007106, Meridian Digital Telephone Key Based Access Expansion Module
- A59007115, Meridian Digital Telephone Display Based Access Expansion Module
- A59007124, Meridian Digital Telephone Group Listening & Password Protection

References

For more information, refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

Hardware requirements

Telephone Provisioning and Soft Key Configuration work with the following Meridian Digital Terminals:

- M3901
- M3902
- M3903

A59007097**Meridian Digital Telephone Provsng. & Soft Key Config. (continued)**

- M3904
- M3905

Meridian Digital Terminals M3900 series function on digital line cards in intelligent peripheral equipment (IPE) with an enhanced extended peripheral equipment controller (EXPEC).

Limitations and restrictions

The following limitations and restrictions apply to Telephone Provisioning and Soft Key Configuration:

- The M3904 and M3905 support a maximum of two Key Based Access Expansion Modules (KBA) or one Display Based Access Expansion Module (DBA).
- A set that has at least one KBA cannot have a DBA, and a set with a DBA cannot have a KBA.

Interactions

The analog terminal adapter (ATA) functions with the Meridian Digital Telephone M3900 series.

Datafill

Telephone Provisioning and Soft Key Configuration does not affect office parameters.

This feature affects the following data schema tables:

- IVDINV—stores information about the Meridian Digital Terminals
- KSETKEYS—supports feature key templates to simplify the configuration of the terminals
- LCCOPT—lists all of the available line class codes (LCC) and compatible options for the LCC

Service orders

Telephone Provisioning and Soft Key Configuration introduce line class codes (LCC) for the terminals. The LCCs are M3901, M3902, M3903, M3904, and M3905. For more information, see the Service Order Reference Manual.

Operational measurements

Telephone Provisioning and Soft Key Configuration do not affect operational measurements.

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Meridian Digital Telephone Provsng. & Soft Key Config. (end)

Logs

Telephone Provisioning and Soft Key Configuration do not affect logs.

User interface

Telephone Provisioning and Soft Key Configuration do not change the user interface.

Billing

Telephone Provisioning and Soft Key Configuration do not affect billing.

A59007106

Meridian Digital Telephone Key Based Access Expan. Mod.

Functionality name

Meridian Digital Telephone Key Based Access Expansion Module (KBA)

Description

The purpose of this feature is to allow Meridian Digital Telephone model M3904 and M3905 users to add Key Based Access Expansion Modules (KBA) to these sets. The KBAs are equipped with 22 keys, used as additional keys, beyond the available physical and self-labeled programmable feature keys on the M3904 and M3905. These additional keys are available as directory number (DN) or feature keys. The terminals and modules attach so that they look and feel like one integrated unit.

There are 32 keys on the model M3904/M3905 Meridian Digital Terminals. The M3904 and M3905 support up to two KBAs with 22 keys each. Therefore, with one KBA, the key numbers are from 1 to 54. With two KBAs, the key numbers are from 1 to 76.

Accompanying features

The following features work in conjunction with Meridian Digital Telephone KBA:

- A59007055, Meridian Digital Telephone Flash Download
- A59007068, Meridian Digital Telephone DN Download
- A59007097, Meridian Digital Telephone Provisioning & Soft Key Configuration
- A59007115, Meridian Digital Telephone Display Based Access Expansion Module
- A59007124, Meridian Digital Telephone Group Listening & Password Protection

References

For more information, refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

Hardware requirements

The KBA is for the Meridian Digital Telephone models M3904 and M3905.

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Meridian Digital Telephone Key Based Access Expan. Mod. (end)

Limitations and restrictions

The following limitations and restrictions apply to Meridian Digital Telephone KBA:

- a KBA cannot be combined with a Display Based Access Expansion Module (DBA)
- a KBA is compatible with Meridian Digital Telephone models M3904 and M3905

Interactions

Meridian Digital Telephone KBA has no functionality interactions.

Datafill

Meridian Digital Telephone KBA

- does not affect office parameters
- affects data schema tables IVDINV. For more information, see the Customer Data Schema Reference Manual.

Service orders

Meridian Digital Telephone KBA affects SERVORD functions NEW, NEWACD, ADO, DEO, and CHF. For more information, see the *Service Order Reference Manual*.

Operational measurements

Meridian Digital Telephone KBA does not affect operational measurements.

Logs

Meridian Digital Telephone KBA does not affect logs.

User interface

Meridian Digital Telephone KBA does not change the user interface.

Billing

Meridian Digital Telephone KBA does not affect billing.

A59007115**Meridian Digital Tel. Display Based Access Expan. Mod.**

Functionality name

Meridian Digital Telephone Display Based Access Expansion Module (DBA)

Description

The Display Based Access Expansion Module (DBA) is optional for the Meridian Digital Telephone models M3904 and M3905. The module physically attaches to the M3904 or M3905 and increases the number of programmable feature keys by 24, for a total of 56 keys. Feature keys 33-56 are on the DBA. The DBA contains a display, eight self-labeled programmable feature keys, and a Shift key. The display shows a set of eight labels next to a key. As a user shifts through the pages of the display (three pages total), the labels change according to the features programmed for the next set of feature keys.

SERVORD provisions the DBA as a line option. Once a DBA is added to a telephone, directory numbers (DN) or features are assigned to the extra keys. Through a key map download from the switch to the set, the DBA keys are enabled according to their assignments. Soft Key labeling is handled by the firmware of the DBA. A soft key label contains up to 10 characters.

Accompanying features

The following features work in conjunction with Meridian Digital Telephone DBA:

- A59007055, Meridian Digital Telephone Flash Download
- A59007068, Meridian Digital Telephone DN Download
- A59007097, Meridian Digital Telephone Provisioning & Soft Key Configuration
- A59007106, Meridian Digital Telephone Key Based Access Expansion Module
- A59007124, Meridian Digital Telephone Group Listening & Password Protection

References

For more information, refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

Hardware requirements

The DBA is for the Meridian Digital Telephone models M3904 and M3905.

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Meridian Digital Tel. Display Based Access Expan. Mod. (continued)

Limitations and restrictions

The following limitations and restrictions apply to Meridian Digital Telephone DBA:

- A DBA is optional for the Meridian Digital Telephone models M3904 and M3905 only. Each telephone accommodates only one DBA.
- A DBA cannot be combined with a Key Based Access Expansion Module (KBA).
- A DBA must be provisioned on Key 1 of the Meridian Digital Telephone.

Interactions

This feature affects the DN Download feature for the Meridian Digital Terminals. For more information, see Meridian Digital Telephone DN Download.

Datafill

Meridian Digital Telephone DBA does not affect office parameters.

The following data schema tables are affected by Meridian Digital Telephone DBA:

- OPTOPT
- IVDINV
- LCCOPT

For more information, see the *Customer Data Schema Reference Manual*.

Service orders

Meridian Digital Telephone DBA creates the DBA option. SERVORD commands affected by this option are NEW, NEWACD, ADO, and DEO. QLEN and QDN commands display a line equipment number (LEN) or directory number (DN) with the DBA option. For more information, see the *Service Order Reference Manual*.

Operational measurements

Meridian Digital Telephone DBA does not affect operational measurements.

Logs

Meridian Digital Telephone DBA does not affect logs.

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Meridian Digital Tel. Display Based Access Expan. Mod. (end)

User interface

Meridian Digital Telephone DBA does not change the user interface.

Billing

Meridian Digital Telephone DBA does not affect billing.

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Meridian Digital Tel. Group Listening & Password Reset

Functionality name

Meridian Digital Telephone Group Listening and Password Reset

Description

Meridian Digital Telephone Group Listening and Password Reset (referred to separately as Group Listening and Password Reset from this point forward) are two features with details for each described in the following paragraphs.

Group Listening is available for models M3902, M3903, and M3904.
Password Reset is available for models M3903, M3904, and M3905.

Group Listening

Group Listening allows the user to turn on the loudspeaker at the same time that the handset is in use. This allows a group of people to listen to the audio, but only the handset transmits audio. Handsfree must be enabled to activate Group Listening. Group Listening differs from Handsfree in that only the loudspeaker, and not the handsfree microphone, is enabled. Other differences between Group Listening and Handsfree are that the handset is off hook, and its audio paths are on with Group Listening.

Group Listening is available when enabled and assigned to the telephone through SERVORD. The user enables the feature through the Options key. If Group Listening is not available to the telephoner, it is not present in the options menu list. Also, Group Listening cannot be activated when Handsfree is in use.

Password Reset

Password Reset is performed by a switch administrator. When users forget their passwords, the command interface (CI) command RESETPWD can reset the password for all directories. When Password Reset is performed on a telephone with password protection enabled, the user must enter the new password to gain access to a list. When Password Reset is performed on a telephone with password protection disabled, the user must enter the new password the next time password protection is enabled.

Accompanying features

The following features work in conjunction with Group Listening and Password Reset:

- A59007055, Meridian Digital Telephone Flash Download
- A59007068, Meridian Digital Telephone DN Download

A59007124**Meridian Digital Tel. Group Listening & Password Reset** (continued)

- A59007097, Meridian Digital Telephone Provisioning & Soft Key Configuration
- A59007106, Meridian Digital Telephone Key Based Access Expansion Module
- A59007115, Meridian Digital Telephone Display Based Access Expansion Module

References

For more information, refer to the *M3900 Series Meridian Digital Telephone Reference Manual*.

Hardware requirements

The Group Listening feature is available for models M3902, M3903, and M3904.

The Password Reset feature is available for models M3903, M3904, and M3905.

Limitations and restrictions

The Group Listening feature requires that Handsfree be enabled.

The Password Reset feature has no limitations or restrictions, other than the hardware requirements.

Interactions

The Group Listening and Password Reset features have no interactions.

Datafill

The Password Reset feature does not affect data schema tables or office parameters.

The Group Listening feature

- does not affect office parameters
- affects data schema tables IVDINV

Service orders

The Group Listening feature is assignable to M3902, M3903, and M3904 terminals using SERVORD commands ADD, NEW, NEWACD, and EST. The SERVORD CHF command toggles the status of the option to a previously

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Meridian Digital Tel. Group Listening & Password Reset (end)

datafilled Meridian Digital Telephone. For more information, see the *Service Order Reference Manual*.

Operational measurements

The Group Listening and Password Reset features do not affect operational measurements.

Logs

The Group Listening and Password Reset features do not affect logs.

User interface

The Group Listening feature does not change the user interface.

The Password Reset feature is issued by RESETPWD at the MAP terminal.

Billing

The Group Listening and Password Reset features do not affect billing.

A59007133
Enhanced IPE Controller

Functionality name

Enhanced IPE Controller

Description

This feature is the software portion of a combined set of software and hardware enhancements to the intelligent peripheral equipment (IPE) controller. The hardware portion is the enhanced extended peripheral controller (EXPEC) card. This controller provides all of the functionality of the previous generation IPE controller, extended peripheral controller (XPEC), plus other capabilities described in the following paragraphs.

A portion of the EXPEC capabilities is directed at all users of this controller. The EXPEC capabilities include

- increased performance from a faster central processing unit (CPU), and an upgraded operating system
- non-volatile flash memory for storage of an IPE software load and a modification to the MAPCI RTS command, which together allow the IPE to be restored to service without the delay of software downloading from the computing module (CM). See note.

Note: The software load stored in flash cannot be upgraded without Optivity Telephony Manager for Meridian SL-100 .

The remainder of the EXPEC capabilities is directed at users of Optivity Telephony Manager for Meridian SL-100 a graphical user interface (GUI)-based management platform for the Meridian SL-100 product. The EXPEC capabilities using the Optivity Telephony Manager for Meridian SL-100 include

- an Ethernet interface and transmission control protocol/internet protocol software, which allows the IPE to communicate with Optivity Telephony Manager for MSL-100 and provides increased bandwidth for file transfer
- the ability to transfer new software loads from repositories on the local area network (LAN) and commit the software loads to non-volatile flash memory while the IPE is in service (see the note in the limitations and restrictions section of this document).

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Enhanced IPE Controller (continued)

- the ability to maintain multiple software load versions in flash memory and to designate which load is to be booted when the IPE is returned to service (RTS) from flash memory
- a set of modified log messages to report status information associated with hardware and software capabilities

Hardware requirements

This feature is developed in conjunction with the IPE controller card (EXPEC) and is deployed with this card. The remaining hardware in the IPE is unchanged and operates with this controller card identically to the way it operates with the controller's predecessor (XPEC).

In addition to the equipment needed for an IPE shelf, the following items are needed for operation with Optivity Telephony Manager for Meridian SL-100:

- 10BaseT Ethernet connection to an EXPEC
- EXPEC card

Limitations and restrictions

The following limitations and restrictions apply to Enhanced IPE Controller:

- supports release MSL11 or higher
- transferring load files to the IPE using the Ethernet interface under direction of the Optivity Telephony Manager for Meridian SL-100 requires one or more repository hosts on the LAN. Each host must contain a copy of the load files and provide an RFC-959-compliant file transfer protocol (FTP) server for accessing the files. The Meridian SL-100 FTP server provides this capability.
- transferring load files using the Ethernet interface is different from loading the IPE using the LOADPM command interface (CI) command. The differences are explained in the following list.
 - Optivity Telephony Manager for Meridian SL-100 transfers loads to flash memory, using the Ethernet interface, while the IPE is in an Inservice (INSV) or Inservice Trouble (ISTB) state. The load in flash

A59007133**Enhanced IPE Controller** (continued)

memory becomes active after the return to service (RTS) peripheral module (PM) FLASH CI command is issued (see the following note).

- The LOADPM CI command is issued while the IPE is in a Manual Busy (MANB) state. This load becomes active after the RTS PM CI command is issued.

Note: In some circumstances, Optivity Telephony Manager for Meridian SL-100 transfers loads while the IPE is in MANB state. The IPE requires a valid load with a valid IP address set in the IPE prior to it being placed in the MANB state. In addition, if the IPE is RTS while Optivity Telephony Manager for Meridian SL-100 is transferring a load, the Optivity Telephony Manager connection is lost, resulting in an incomplete load file in the IPE flash memory.

While Optivity Telephony Manager for Meridian SL-100 transfers an IPE load stored in a valid repository (for example, an FTP server), the switch requires the IPE load to be stored on a disk storage device (for example, System Load Module [SLM]) to clear PM loader faults and for proper use of the IPE system recover controller.

For any communication with OTM for Meridian SL-100 to occur, the IPE must be datafilled as an EXPEC, with a valid IP address, subnet mask, and gateway. An RTS must be performed to set these parameters in the IPE. Any changes to these parameters requires a subsequent RTS to activate the changes.

Interactions

Enhanced IPE Controller has no functionality interactions.

Datafill

Enhanced IPE Controller does not affect office parameters.

Enhanced IPE Controller modifies data schema table IPEINV by adding the following fields:

- XPEC type—used by the front-end software to distinguish between the XPEC card and the EXPEC card
- IP port status—determines whether OTM for MSL-100 uses the port for maintaining load files
- IP address—downloads files to the EXPEC card

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Enhanced IPE Controller (continued)

- Subnet mask—calculates the network ID and host ID
- Default gateway—indicates the IP address of a router, if one is present on the network segment to which the EXPEC is attached

Service orders

Enhanced IPE Controller does not affect SERVORD.

Operational measurements

Enhanced IPE Controller does not affect operational measurements.

Logs

Enhanced IPE Controller affects logs PM128, PM181, and PM189.

The following log messages are generated for PM128:

- XPEC type mismatch
- IP port info mismatch

The following log messages are generated for PM181:

- MSL version message sent
- Time/day message sent
- IP address sent

The following log messages are generated for PM189:

- Corrupt load transferred
- Memory not initialized
- Heap error
- SRAM write deficiency
- flash memory failure
- flash boot load update
- flash boot load update failure
- Ethernet connection accepted/rejected

User interface

Enhanced IPE Controller does not change the user interface.

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Enhanced IPE Controller (end)

Billing

Enhanced IPE Controller does not affect billing.

A59007614

SNMP Enhancements for Optivity Telephony Mgr.

Functionality name

SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100.

Description

This feature affects the management information base (MIB) of the DMS-100 and Meridian SL-100 products by providing additional security to SNMP messages. In this document, the feature name is shortened to SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100.

DMS-100 management information base enhancements

The MIB is enhanced by the following maintenance and monitoring operations in DMS-100 switches.

- Increased log trap size—allows Optivity Telephony Manager for Meridian SL-100 to set the log trap text size using SNMP
- Log filtering on trap number and event type—allows Optivity Telephony Manager for Meridian SL-100 to select the type of logs to generate traps, based on the trap number and the event type

MSL-100 management information base enhancements

The MIB is enhanced by the following maintenance and monitoring operations in Meridian SL-100 switches:

- Monitoring the P-side of a node
- Filtering on node state
- Provisioning QueryPM with fault information
- Provisioning LTP and LTPMan level commands
- Filtering on line state
- Provisioning TTP level commands
- Getting the IP address of IPE controller cards
- Getting the MAPCI; MTC top level alarms

Monitoring the P-side of a node

This MIB object provides information about P-side links of a node. The output fields of the object are

- P-side node number
- P-side node state
- Device name of P-side node

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- Port number
- Speech/message capability
- Message condition

Filtering on node state

This MIB object allows Optivity Telephony Manager for Meridian SL-100 to identify all the nodes in a particular state. The nodes allow filtering on the following states:

- Node okay
- Node machine busy
- Node manual busy
- Node offline
- Node unequipped
- Node inservice trouble (for peripheral modules [PM])
- Node system busy (for PMs)
- Node C-side busy (for PMs)

Provisioning QueryPM with fault information

This MIB object allows Optivity Telephony Manager for Meridian SL-100 to monitor various PMs using SNMP. It also provides fault information about PMs.

The output fields of this object are

- Node number
- PM type
- PM number
- Number of PMs equipped for an office
- Location information
- Load file information
- Product engineering code
- Node status
- Fault information
- Threshold limit for messages

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SNMP Enhancements for Optivity Telephony Mgr. (continued)

- IPE datafilled and IPE actual card information
- Ring generator status

Provisioning LTP and LTPMan level commands

The following paragraphs and lists give more detail about the LTP and LTPMan level commands.

LTP level commands are

- DIAG
- AlmStat
- CktLoc
- Hidden command—FRLS

LTPMan level commands are

- Loss
- Noise
- ToneGen
- Jack
- Tstring
- Balance
- RlsConn
- Hold
- Ckttst
- Sustate

LTP level command—DIAG This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the DIAG command using SNMP. The DIAG command performs an extended diagnostic test on a line that is in the idle (IDL) or manual busy (MB) state. The command output field is DIAG Result.

LTP level command—AlmStat This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the AlmStat command using SNMP. The AlmStat command queries the alarm system of the line maintenance subsystem (LNS) and displays the status of alarms. It also

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changes the thresholds of the alarm classes in the switch. The command output fields are

- threshold values of the different alarms
- number of different working lines, terminals
- node dial tone speed recording (DTSR) display information

LTP level command—CktLoc This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the CktLoc command using SNMP. The CktLoc command locates and identifies the circuit card used for the line circuit, and display circuit characteristics. The command output fields are

- Bay id
- H/W device
- Product equipment code
- Floor number
- Row number
- Shelf number
- Site name
- Drawer number
- Loss (attenuation) pad setting for local-to-local calls
- Balance network

Provisioning hidden LTP command—FRLS This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the FRLS command using SNMP. The FRLS command forcibly disconnects a line circuit from test equipment or any other circuit, and change its state to MB.

LTPMan level command—Loss This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Loss command using SNMP. The Loss command measures the insertion loss of a test tone sent from the subscriber end of a loop to its line circuit. The command output field is the loss measurement in dBm.

LTPMan level command—Noise This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Noise command using SNMP. The Noise command measures the C-message weighted circuit

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SNMP Enhancements for Optivity Telephony Mgr. (continued)

noise on a subscriber loop. The command output field is the noise measurement in dBRNC.

LTPMan level command—ToneGen This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the ToneGen command using SNMP. The ToneGen command transmits a tone on a subscriber loop. The command output field states whether the specified tone is generated.

LTPMan level command—Jack This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Jack command using SNMP. The Jack command connects a jack-ended trunk to a subscriber line, or a jack to a subscriber loop while bypassing the line card. The command output field states whether the specified jack is connected.

LTPMan level command—Tstring This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Tstring command using SNMP. The Tstring command tests the ringing relay in the line card for proper functioning. The command output field states whether the test passed.

LTPMan level command—Balance This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Balance command using SNMP. The Balance command performs an on-hook balance network test on a subscriber loop. The command output fields are balance network value, and loss pad value.

LTPMan level command—RlsConn This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the RlsConn command using SNMP. The RlsConn command releases test equipment connected to a line. The command output field states whether the connection is released.

LTPMan level command—Hold This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Hold command using SNMP. The command output field gives the status of the hold command performed on a line.

LTPMan level command—Ckttst This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Ckttst command using SNMP. The Ckttst command sends test messages to test the line. The command output field is the number of test messages received.

LTPMan level command—Sustate This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Sustate command using SNMP. The Sustate command determines the subscriber status of the

A59007614**SNMP Enhancements for Optivity Telephony Mgr. (continued)**

EBS connected to the business set line. The command output field states the result of the sustate command.

Filtering on line state

This MIB object allows Optivity Telephony Manager for Meridian SL-100 to identify all the lines in a specified state, using SNMP.

Provisioning TTP level commands

The following paragraphs and lists give more detail about the TTP commands.

TTP level command—TST This MIB object allows Optivity Telephony Manager for Meridian SL-100 to execute the test (TST) command for specified trunks using SNMP. The type of test is specified as a parameter of the TST command.

TTP level command—Cktloc This MIB object allows Optivity Telephony Manager for Meridian SL-100 to perform the Cktloc command for trunks using SNMP. This command provides information about the physical location of the circuit. The command output fields are

- Site name
- Floor location
- Row number
- Bay id
- Shelf number
- Device description
- Card position
- Product equipment code
- Circuit number
- Receive pad setting
- Transmit pad setting
- Maintenance noise limit
- Immediate action noise limit
- Expected measured loss
- Precision balance unit

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SNMP Enhancements for Optivity Telephony Mgr. (continued)

- Loop length
- Compensation resistor

TTP level hidden command—FRLS This MIB object allows Optivity Telephony Manager for Meridian SL-100 to force release trunks with the FRLS command using SNMP.

Getting the IP address of IPE controller cards

This MIB object allows Optivity Telephony Manager for Meridian SL-100 to obtain the IP addresses of the enhanced IPE controller cards, using SNMP.

Getting the MAPCI;MTC top level alarms

This MIB object allows Optivity Telephony Manager for Meridian SL-100 to access the alarm status for different categories of switch equipment. This information is available using MAP as the alarm banner at MAPCI;MTC level. The alarm type and alarm text are also available.

Access to the following is provided with this object:

- Alarm status for CM
- Alarm status for MS
- Alarm status for IOD
- Alarm status for Net
- Alarm status for PM
- Alarm status for CCS
- Alarm status for LNS
- Alarm status for TRKS
- Alarm status for EXT

Security enhancements

This feature ensures authenticity of SNMP messages. Authenticating SNMP messages allows Optivity Telephony Manager for Meridian SL-100 to perform maintenance operations in a secure manner.

SNMP sessions are established with userID and password verification. The userID is the same as that used for the switch login. A new password is given for the SNMP user, and is provisioned through SNMPUTIL. The IP address, from which an SNMP user starts an SNMP session, may be restricted and is also provisioned through SNMPUTIL. Every session has a unique sessionID.

A59007614**SNMP Enhancements for Optivity Telephony Mgr. (continued)**

An inactivity timer is started when an SNMP session is started. This timer resets on receipt of an authentic SNMP message. On expiration of the inactivity timer, the SNMP session terminates automatically.

SNMPUTIL has additional commands to monitor and terminate SNMP sessions, edit the trap destination table, and select the message format.

Starting and terminating SNMP sessions

The processes of starting and terminating SNMP sessions are transparent to the Optivity Telephony Manager for Meridian SL-100 user. An SNMP session starts when Optivity Telephony Manager for Meridian SL-100 exchanges the first GET request on the session login device. The SNMP session terminates when Optivity Telephony Manager for Meridian SL-100 is exited or the inactivity timer expires. If the inactivity timer expires, the user must restart an SNMP session, or the switch will not respond to requests. The inactivity timer value is set through Optivity Telephony Manager for Meridian SL-100.

Accessing session information

Information associated with the SNMP sessions is available through the sessionMIB command. This allows Optivity Telephony Manager for Meridian SL-100 access to the following fields:

- Session ID—the session ID of the user
- User ID—the user ID
- Login time—the SNMP session start time
- IP address—the IP address of the user
- Inactivity timer—the inactivity timer value

References

See the *Meridian SL-100 Switch Manager User Guide, P0887028*, for more information.

Hardware requirements

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature requires an Ethernet interface unit (EIU).

Limitations and restrictions

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature requires software release MSL11 or greater.

A59007614

SNMP Enhancements for Optivity Telephony Mgr. (continued)

Interactions

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature has no functionality interactions.

Datafill

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature

- creates data schema table SNMPTAB
- does not affect office parameters

Service orders

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature does not affect SERVORD.

Operational measurements

The SNMP Enhancements for Optivity Telephony ManagerOptivity Telephony Manager for Meridian SL-100 feature does not affect operational measurements.

Logs

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature affects three logs as indicated in the following list:

- SNMP 101—when an SNMP user starts an SNMP session, the following attributes are logged:
 - userID
 - log-in time
 - IP address
- SNMP 102—when an SNMP user ends an SNMP session, the following attributes are logged:
 - userID
 - log-in time

A59007614**SNMP Enhancements for Optivity Telephony Mgr. (end)**

- log-out time
- IP address
- SNMP 103—when an SNMP user performs a maintenance operation. The following maintenance operations generate this log:
 - LTP: Diag, Loss, Noise, Tonegen, Jack, Tstring, Balance, Frls and Ckttst
 - TTP: Tst and Frls

The following attributes are logged:

- userID
- IP address
- time of execution of the command
- command performed

User interface

The following are user interface commands provided by the command interface (CI) command SNMPUTIL:

- WHO—lists all SNMP users with active SNMP sessions
- TERMINATE—terminates the active SNMP sessions specified by the sessionID in the command, or terminates all active sessions if sessionID "0" is used in the command
- TRAPDESTEDIT—allows access to edit the Trap Destination Table
- MAXSESSION—controls the maximum number of active SNMP sessions at a given instance of time
- ADDUSER—permits SNMP access to the specified user in the command
- DELUSER—denies SNMP access to the specified user in the command
- DISPLAYUSERS—displays all users with SNMP access
- NEWMSGFORMAT—allows user to select the message format
- PASSWD—allows user to change password

Billing

The SNMP Enhancements for Optivity Telephony Manager for Meridian SL-100 feature does not affect billing.

A59009240

PRI on RCC2 for MSL-100

Functionality name

PRI on RCC2 for MSL-100

Description

This feature supports primary rate interface (PRI) national integrated services digital network-2 (NI-2) trunks off the MSL-100 switch remote cluster controller 2 (RCC2).

RCC2 general description

The RCC2 is a remote peripheral based on the common peripheral module (CPM) shelf.

The C-side of the RCC2 is connected with up to 20 digital signal level 1 (DS1) links to a host peripheral, such as line/trunk controller (LTC), line group controller (LGC), or integrated services digital network (ISDN) line/trunk controller (LTCL).

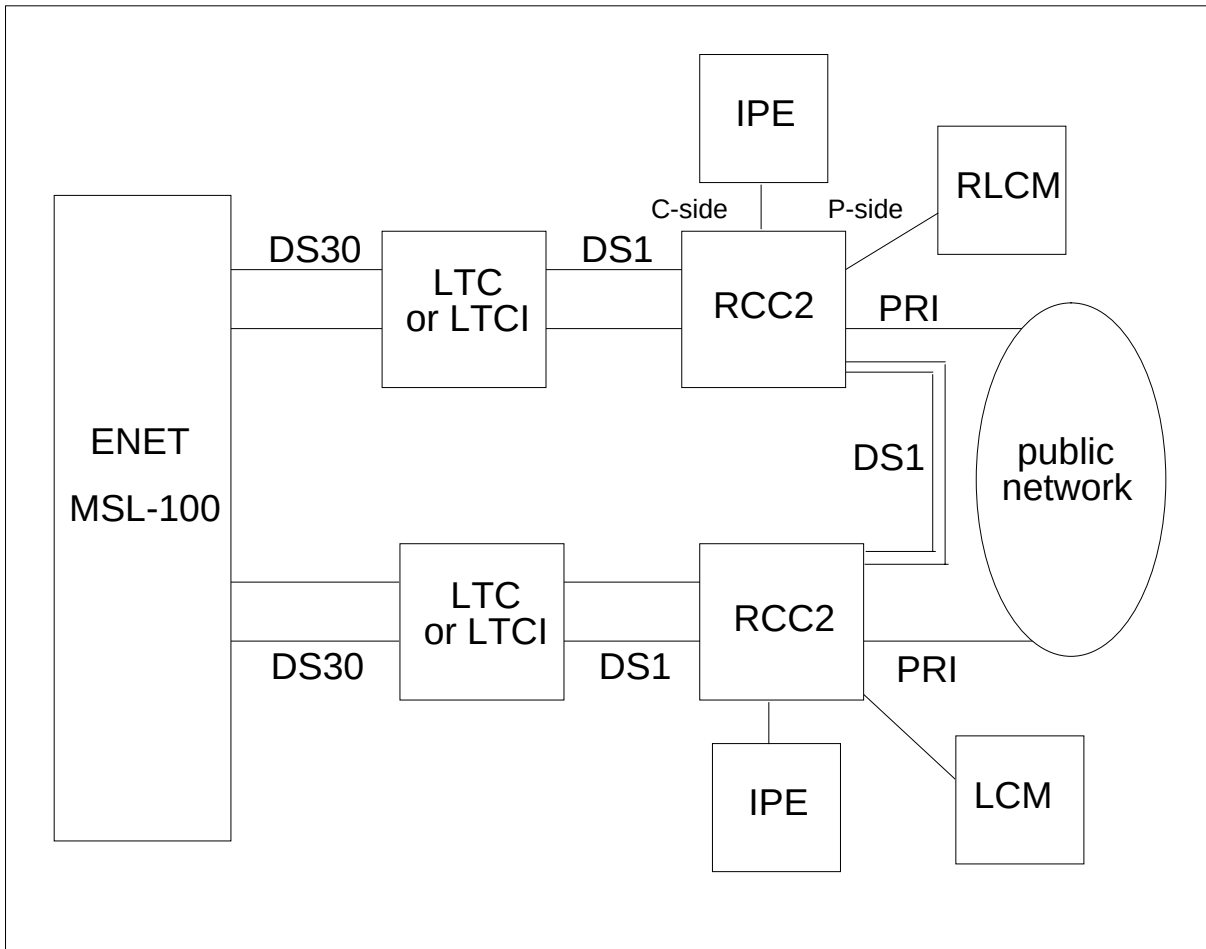
The RCC2 main shelf supports up to 24 DS1 links on its P-side. The RCC2 main shelf, with an extension (half shelf), can support up to 48 DS1 links.

The main features of the RCC2 are as follows:

- LCM/LCME support off DS30A links
- RLCM off DS1 links
- Star Remote off DS1 links
- ISDN line drawer (ILD) support, in the following possible configurations:
 - LCM/RLCM, up to two ILDs
 - Star Remote, up to six ILDs
- remote line drawer (RLD). Starting at NA11, up to 16 RLDs are deployed off the Star Remote, over DS1 links.
- trunks support
- dual support
- intraswitching capabilities using P-side to P-side matrix connections
- emergency stand alone (ESA) support, including warm entry/exit

PRI on RCC2 configuration

The following diagram shows one of the possible configurations for the RCC2, as it can be used in a dual and non-dual configuration off the same LTC.

A59009240**PRI on RCC2 for MSL-100 (continued)****PRI on dual RCC2 configuration****Dual RCC2**

When two RCC2s are connected by DS1 links on each P-side, they are in dual configuration. The links are called interlinks. The dual configured RCC2s are considered spouses. Calls originating in one RCC2 and terminating in its spouse RCC2 are completed using channels on interlinks, with no need to use C-side speech channels. These calls are referred to as interswitched calls.

Scope of work

PRI on RCC2 provides the following functionalities:

- support PRI static trunks on RCC2
- support PRI dynamic trunks on RCC2

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PRI on RCC2 for MSL-100 (continued)

- support PRI in ESA mode
- support ESA warm entry/exit for PRI calls
- support dual RCC2 configuration for PRI calls
- interworking support, according to the following list:
 - plain ordinary telephone service (POTS) to PRI
 - electronic business set (EBS) to PRI
 - business rate interface (BRI) to PRI
 - public telephone service (PTS) trunk to PRI
 - Signaling System 7 (SS7) trunk to PRI
 - Emergency Service Bureau (ESB) trunk to PRI
 - PRI to PRI

Hardware requirements

This feature is designed for an RCC2.

Limitations and restrictions

The following limitations and restrictions apply to PRI on RCC2:

- only the Nortel Networks NI-2 PRI (NTNIPRI) variant is supported with this feature
- ESA mode operation supports the following:
 - Basic Call, which is composed of
 - speech
 - 3.1 KHz audio
 - 64 kbps unrestricted digital
 - 64 kbps unrestricted digital, rate adapted from 56 kbps
 - Back-up D-channel
- Normal mode operation supports the following:
 - Basic Call, as described above
 - Back-up D-channel
 - Integrated Service Access (Call by Call)
 - Dialable Wideband (Nx64)
 - Calling Name Delivery

A59009240**PRI on RCC2 for MSL-100** (continued)

- Integrated business network two-way trunk group (IBNT2) ISDN and PRA trunks are supported for PRI
- C-side speech channels connect the enhanced ISDN signaling processor (EISP) with the PRI D-channels
- B-channel negotiation is not supported by MSL-100 during normal mode or ESA mode
- PRI trunks are defined on the first 20 DS1 links off the RCC2 P-side
- The number of possible PRI D-channels depends on the number of ILD/RLDs existing, and the number of ILD/RLDs depends on the PRI D-channels (see the following table). The exact numbers can also be calculated by interpolation.

The following table describes the alternatives for PRI D-channels.

ILD/RLD versus PRI D-channels

BRI D-ch. cards	ILD/RLD number	PRI D-channels
=< 10	9	20
=< 10	27	16
=< 10	54	10
=< 10	82	4
=< 10	100	0

Interactions

PRI on RCC2 has no functionality interactions.

Datafill

The datafill required to define a PRI on RCC2 is the same as it is for PRI trunks on LTCL. For more information, refer to the *Integrated Services Digital Network Primary Rate Interface Translations Guide*.

PRI on RCC2 affects the following data schema tables, of which information about provisioning are in the following paragraphs.

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PRI on RCC2 for MSL-100 (continued)

The following data schema tables are not changed by this feature, but must be datafilled in order for this feature to work:

- RCCINV
- LTMAP
- LCMDRINV

The following data schema tables are changed by this feature:

- RCCPSINV
- ISTRKGRP
- TRKSGRP
- TRKMEM

RCCINV table provisioning

The inventory data besides the P-side link assignments are defined in table RCCINV. It is not possible to delete the EISP card when PRI trunks are defined on the peripheral module (see note). An error message is generated in such a case, and the tuple change is not accepted. See the following datafill example for table RCCINV.

Note: In an opposite situation, a check for existence of an EISP definition is made in the first definition of a PRI trunk on the RCC2.

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PRI on RCC2 for MSL-100 (continued)

Table RCCINV tuple RCC2

```

RCCNAME
ADNUM  FRTYPE  FRNO  SHPOS  FLOOR  ROW  FRPOS  EQPEC  LOAD
CSPM
EXECTAB
CSLNKTAB
ESA INTRASW ADDLMSGL
OPTCARD
TONESET
PROCPEC
E2LOAD
EXTINFO
OPTATTR
-----
REM1      RCC2      4
          5      CRSC      3      18          2          B          5  MX85AA  XRI11AP
(POTS POTSEX) (KEYSET KSETEX) (ABTRK DTCEX) (RMM_TERM RSMEX)
(ESALINES ESAEX) (PRAB DTCEX) $
      LTC      0
          (      0) (      1) (      2) (      4) (      3) (      5) $
Y          N          N
          (      UTR6 ) (  MSG6X69) (      ISP 4) $
NORTHAM
          BNK0NI05
          AX74AA AX74AA
          N
$

```

RCCPSINV table provisioning

The P-side links are defined in table RCCPSINV. Each link has its own link type. For the PRI trunks the link type is DS1PRA. See the following datafill example for table RCCPSINV.

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PRI on RCC2 for MSL-100 (continued)

Table RCCPSINV tuple RCC2

RCCNAME		PSLNKTAB	

REM1	RCC2	4	
(0 NILTYPE) (1 DS1 DEFAULT Y) (2 DS1PRA PRI N 1 NIL \$)			
(3 DS1PRA PRI N 1 NIL \$) (4 DS1PRA PRI N 1 NIL \$)			
(5 DS1PRA PRI N 1 NIL \$) (6 DS1PRA PRI N 1 NIL \$)			
(7 DS1PRA PRI N 1 NIL \$) (8 NILTYPE) (9 DS1 DEFAULT Y)			
(10 DS1PRA PRI N 1 NIL \$) (11 DS1PRA PRI N 1 NIL \$)			
(12 DS1PRA PRI N 1 NIL \$) (13 DS1PRA PRI N 1 NIL \$)			
(14 DS1PRA PRI N 1 NIL \$) (15 DS1PRA PRI N 1 NIL \$)			
(16 DS1 DEFAULT Y) (17 DS1 DEFAULT Y) (18 DS1 DEFAULT Y)			
(19 DS1 DEFAULT Y) (20 NILTYPE) (21 NILTYPE) (22 NILTYPE) (23 NILTYPE)			
(24 NILTYPE) (25 NILTYPE) (26 NILTYPE) (27 NILTYPE) (28 NILTYPE)			
(29 NILTYPE) (30 NILTYPE) (31 NILTYPE) (32 NILTYPE) (33 NILTYPE)			
(34 NILTYPE) (35 NILTYPE) (36 NILTYPE) (37 NILTYPE) (38 NILTYPE)			
(39 NILTYPE) (40 NILTYPE) (41 NILTYPE) (42 NILTYPE) (43 NILTYPE)			
(44 NILTYPE) (45 NILTYPE) (46 NILTYPE) (47 NILTYPE) (48 DS30A)			
(49 DS30A) (50 DS30A) (51 DS30A) (52 NILTYPE) (53 NILTYPE) \$			

ISTRKGRP table provisioning

Dynamic trunks are defined in table ISTRKGRP. See the following datafill example for table ISTRKGRP.

Table ISTRKGRP

ISTRKKEY			XPMNAME

TTIMF3	REM1	RCC2	3
PRI1	REM1	RCC2	4
DTRK1	REM1	RCC2	4
DTRK2	REM1	RCC2	4

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PRI on RCC2 for MSL-100 (continued)

TRKSGRP table provisioning

When a trunk is defined as a PRI trunk (GRPTYP in IBNT2 or PRA in TRKGRP table), the location of the D-channel for this trunk is defined in table TRKSGRP. See the following datafill example for table TRKSGRP.

Table TRKSGRP tuple RCC2

SGRPKEY CARDCODE									
SGRPVAR									

SGRPVAR									

PRI1 0 DS1SIG									
ISDN 20 20	87Q931	2	N	STAND	USER	PT_PT	USER N	UNEQ	
50 N DEFAULT	RCC2	4	12 24	64K	HDLC				
				\$					
						\$			

TRKMEM table provisioning

The B-channels of the PRI trunk are defined in table TRKMEM, this table defines PRI B-channels on an RCC2. See the following datafill example for table TRKMEM.

Table TRKMEM tuple RCC2

CLLI	EXTRKNM	SGRP	MEMVAR		
PRI1	1	0	RCC2	4	12 2

LTMAP table provisioning

The LTMAP table specifies a logical terminal identifier and access privileges for the PRI trunk group. See the following datafill example for table LTMAP.

A59009240

PRI on RCC2 for MSL-100 (end)

Table LTMAP tuple PRI on RCC2

LTKEY			MAPPING			OPTION		
-----			-----			-----		
PRI	234	CLLI	RCC2_PRI1			(	TEI	0)\$

LCMDRINV table provisioning

Table LCMDRINV must be datafilled for this feature to work. A limitation exists on the number of D-channels and ILD/RLDs defined on the same RCC2. Please refer to the limitations and restrictions section in this document.

Service orders

PRI on RCC2 does not affect SERVORD.

Operational measurements

PRI on RCC2 does not affect operational measurements.

Logs

PRI on RCC2 affects ISDN logs 401 and 402. For more information about these logs, see the *Log Report Reference Manual*.

User interface

PRI on RCC2 does not change the user interface.

Billing

PRI on RCC2 does not affect billing.

A59011306**Meridian Cabinet Network Interface (MCNI)****Feature name**

Meridian Cabinet Network Interface (MCNI)

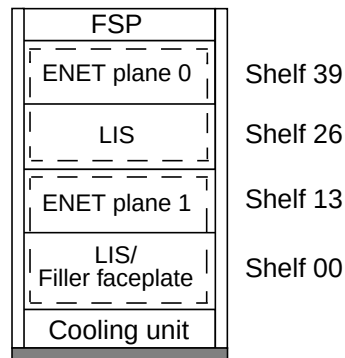
Description

This software feature allows the hardware of the same name, MCNI, to be datafilled, for a combined cabinet of the enhanced network (ENET) and the fiberized link interface shelf (FLIS). Tables SUSHELF and ENINV are datafilled. The frame product equipment code (PEC), NTYA05AA, is also used in table ENINV. See the *Customer Data Schema Reference Manual* for more information about provisioning the software feature MCNI.

If only one link interface shelf (LIS) is provisioned, it must be on shelf 26 of the MCNI hardware. A second LIS, or blank panel is provisionable for shelf 00 of the MCNI hardware. See the following diagram for an example of the MCNI hardware configuration used as a combined ENET and FLIS.

Meridian Cabinet Network Interface components

Meridian Cabinet Network Interface

**Hardware requirements**

The MCNI software feature requires the MCNI hardware, NTYA05AA. However, if a site has the ENET hardware installed, the customer can upgrade the ENET to an MCNI by using the upgrade kit, NTYA05UK.

A59011306

Meridian Cabinet Network Interface (MCNI) (end)

Limitations and restrictions

The datafill for the MCNI software feature is exclusive to the MCNI hardware and must not be used for other cabinet types.

Interactions

MCNI has no functionality interactions beyond those of ENET and FLIS.

Datafill

MCNI does not change office parameters.

MCNI affects data schema tables SUSHELF and ENINV. No new fields are introduced. The range commands are changed for the tables to allow for extra options. For more information, refer to the Customer Data Schema Reference Manual.

Service orders

MCNI does not change the Service Order System (SERVORD).

Operational measurements

MCNI does not change operational measurements (OM).

Logs

MCNI does not change logs.

User interface

MCNI does not change the user interface.

Billing

MCNI does not generate billing records or changes.

A59013044

Meridian Digital Telephone (M3900 Series) Desktop Enhancements

Feature name

Meridian Digital Telephone (M3900 Series) Desktop Enhancements

Description

This feature adds the following new capabilities or enhancements to the M3900 series sets:

- Icon-Based Display Indication
- Auto Display (AUTODISP) Enhancement

Icon Based Display Indication

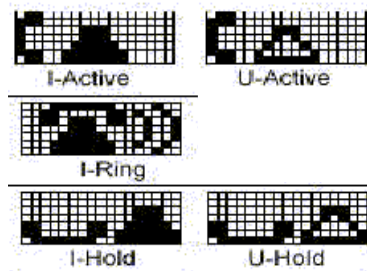
Icon-Based Display Indication displays various functional icons on the Key-Based Access Expansion Module (KBA), Display-Based Access Expansion Module (DBA), and Meridian Digital Telephone M3904 sets. The icons for the KBA and DBA are fixed. The icons for the M3904 set are based on a 9 x 17 pixel bit-mapped cell. This feature does not apply to the M3901, M3902, M3903, and M3905 sets.

The functions displayed are I-Ringing, I-Active, U-Active, I-Hold, and U-Hold. The icons appear on the LCD displays located next to the DN or feature keys for the M3904 sets, DBAs, and KBAs. The scenarios for these icons are as follows:

- I-Ringing: The I-Ringing icon displays for incoming calls on supported terminals.
- I-Active: The I-Active icon displays when a user goes off-hook for supported terminals.
- U-Active: The U-Active icon displays on supported terminals within a MADN SCA group. This icon appears on all of the other MADN-supported terminals that have not answered the call to the MADN DN after the call has been established.
- I-Hold: The I-Hold icon displays for holding calls on supported terminals that control the call.
- U-Hold: The U-Hold icon displays on supported terminals within a MADN SCA group. This icon appears on all the other MADN-supported terminals that do not have control of the call, when a set that has answered the call places it on hold.

A59013044**Meridian Digital Telephone (M3900 Series) Desktop Enhancements**

The following figure shows examples of the icons used with the previous scenarios.

Icons example**Auto Display Enhancement**

The Auto Display Enhancement feature allows the existing Auto Display (AUTODISP) option to be extended to cover all keys on a multiline terminal that can be datafilled as a DN. This capability includes keys on add-on, KBA, and DBA modules; previous generation MSL IVD terminals with displays; and Meridian Business Sets (in addition to M3900 Series Meridian Digital Telephones). Auto Display Enhancement allows datafill for the Autodisp option to go up to key 76, instead of the previous limitation of up to key 9.

The following table shows the terminals which are affected by the Auto Display Enhancement feature.

MSL IVD sets affected by the Auto Display Enhancement (Sheet 1 of 2)

LCC	Current Auto Display keys	Enhanced Auto Display keys	Enhanced Auto Display Add-on keys
M2317	1-12	NA	NA
M3000	1-12	NA	NA
M2018	1-18	NA	NA
M2112	1-12	NA	NA
M2016	1-9	1-16	17-38 or 17-60
M2216	1-9	1-16	17-38 or 17-60
M2616	1-9	1-16	17-38 or 17-60

A59013044**Meridian Digital Telephone (M3900 Series) Desktop Enhancements****MSL IVD sets affected by the Auto Display Enhancement (Sheet 2 of 2)**

LCC	Current Auto Display keys	Enhanced Auto Display keys	Enhanced Auto Display Add-on keys
M2616CT	1-9	1-16	NA
M3904	1-9	1-12	33-54, 33-76, or 33-56
M3905	1-8	1-8	33-54, 33-76, or 33-56
M5316	1-9	1-14	15-36, 15-58
M5216	1-9	1-13	15-36, 15-58
M5009	1-9	NA	12-29, 30-47, 48-65
M5209	1-9	NA	12-29, 30-47, 48-65
M5112	1-9	1-11	12-29, 30-47, 48-65
M5212	1-9	1-11	12-29, 30-47, 48-65
M5312	1-9	1-11	12-29, 30-47, 48-65

The following are valid combinations for the various terminals and the Auto Display Enhancement feature:

- Terminals M2016, M2216, and M2616 may have one or two M0022 add-on modules. Each add-on module has 22 keys.
- Terminals M3904 and M3905 may have one or two KBAs or one DBA. A KBA has 22 keys, and a DBA has 24 keys.
- Terminal M5216 and M5316 may have one or two M522 modules. An M522 has 22 keys.
- Terminals M5009, M5209, M5112, M5212, and M5312 may have one, two, or three M518 modules. They may also have an M536 module. These terminals may also have one M518 module and one M536 module. An M518 module has 18 keys and an M536 module has 36 keys.
- Terminals with nine or less keys are not affected by this enhancement.

Hardware requirements

The Meridian Digital Telephone (M3900 Series) Desktop Enhancements feature has no hardware requirements. This feature uses Meridian Digital Telephone (M3900 Series) sets introduced in software release MSL11.

A59013044

Meridian Digital Telephone (M3900 Series) Desktop Enhancements

Limitations and restrictions

The limitations and restrictions that follow apply to the Meridian Digital Telephone (M3900 Series) Desktop Enhancements feature:

- **Icon-Based Display Indication:** This feature applies only to the Meridian Digital Telephone M3904 set, DBA, and KBA. The U icons (U-Hold, U-Active) are supported only for MADN SCA arrangements.
- **Auto Display Enhancement:** Except for the nine key maximum, this feature supports all restrictions or limitations that exist for AUTODISP. Up to 24 DN keys on a set can have AUTODISP assigned.

Interactions

Meridian Digital Telephone (M3900 Series) Desktop Enhancements does not interact with other functionalities.

Datafill

Meridian Digital Telephone (M3900 Series) Desktop Enhancements does not change data schema tables or office parameters.

Service orders

Auto Display Enhancement affects service orders (SERVORD). The impact of this feature on SERVORD is that it allows the user to enter a number higher than nine as a KEYLIST entry for the AUTODISP option. For more detailed information on how this feature affects SERVORD, refer to the Service Order Reference Manual.

Operational measurements

Meridian Digital Telephone (M3900 Series) Desktop Enhancements does not change operational measurements (OM).

Logs

Meridian Digital Telephone (M3900 Series) Desktop Enhancements does not change logs.

User interface

Meridian Digital Telephone (M3900 Series) Desktop Enhancements does not change the user interface.

Billing

Meridian Digital Telephone (M3900 Series) Desktop Enhancements does not generate billing records or changes.

A59019794

SMDI ID Override

Feature name

SMDI ID Override

Description

The SMDI IDOVR feature creates a line option IDOVR. When IDOVR is assigned to a line, the line can pass an intermediate directory number (DN) in a call forward chain to the voice messaging system (VMS) over SMDI links.

The MSL14 software release adds the feature Simplified Messaging Desk Interface SMDI ID Override (IDOVR). This feature enables the passing of intermediate Directory Numbers (DN) to the Voice Messaging Service (VMS) over SMDI links, allowing the customer to determine which DN's greetings will be presented to the caller in a call forward chain.

Without IDOVR assigned to a line, it is not possible to pass an intermediate DN in a call forward chain. In other words, without IDOVR, either the call forward originating DN or the last forwarding DN is passed to the VMS over SMDI links.

Functionality

The line option IDOVR requires a sub-field Application (APP) entry.

Note: The sub-field is used in order to pass the appropriate DN to the SMDI link. Simply setting the APP sub-field to Y does not create a voice mailbox on the VMS.

The following rule is provided for greater understanding about how SMDI ID Override works. ***This rule and the following commentary assume that the switch maintenance personnel datafilled the IDOVR line option with certain knowledge of whether or not a voice mailbox exists for each DN where IDOVR is assigned.***

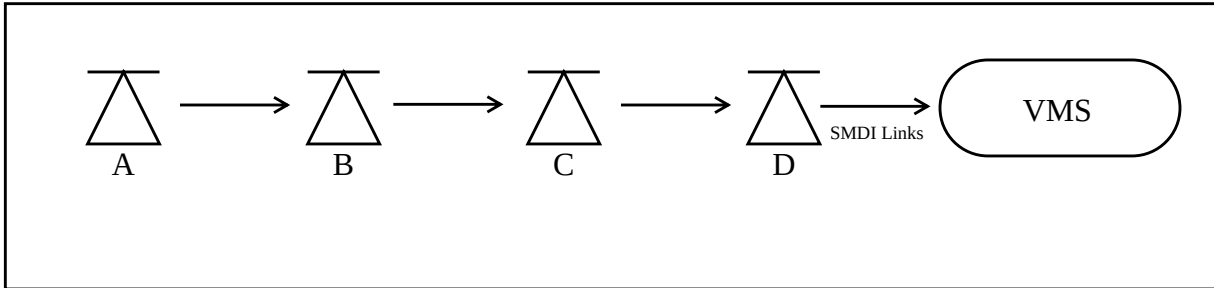
Rule

In any call forward chain, existing call forwarding rules apply unless the last DN assigned IDOVR is set to APP=Y, whereupon its DN is passed to the SMDI links, or the last assigned IDOVR is set to APP=N, in which case the last DN in the call forward chain is passed.

Remarks

The following figure and table explain how SMDI ID Override works. Refer to the table to determine the status of any call chain, with reference to the IDOVR assignment and the APP= sub-field setting. Consider the case

illustrated in Figure 1 where a call originally comes or is transferred to Station A, who forwards it to B. It is then forwarded to C, then to D, and finally to the Voice Message System. B and C represent any number of intermediate DNs in the chain from one to three (which would give the maximum number of allowable DNs for a call forward chain).



In the following table, an entry in the B, C, or D columns indicates IDOVR is assigned. The entry indicates the APP= status.

Table 1. IDOVR Assignment and APP Status

A	B	C	D	DN Passed, LASTFWDN enabled	DN Passed, LASTFWDN NOT enabled
				D	A
	APP=N			D	D
	APP=Y			B	B
	APP=Y/N	APP=Y		C	C
	APP=Y/N	APP=N		D	D
			APP=Y/N	D	D
APP=Y				A	A
APP=N				D	D

Notice that the IDOVR status of D, the last DN in the chain, makes the result equivalent to LASTFWDN enabled without IDOVR assigned to any DNs. Setting the last intermediate DN to IDOVR/APP=N is also the logical equivalent of enabling LASTFWDN with no IDOVR assignments insofar as determining which DN is passed to the SMDI links.

Assignability

The line option IDOVR can be assigned to all the line class codes (LCC) in the MSL-100 market through Service Orders (SERVORD). Please refer to the SERVORD chapter of this book for more details.

Hardware requirements

SMDI ID Override has no hardware requirements.

Limitations and restrictions

The limitations and restrictions that follow apply to SMDI ID Override:

- Customers who may receive sensitive phone messages should fully understand the limitations of both LASTFWDN and IDOVR. These customers may include those who received privileged communications such as attorney/client or doctor/patient messages or any other messages of a confidential nature.
- Regardless of any call forward variety assigned on a line, IDOVR can be assigned to a DN.
- The line option will override only LASTFWDN option or default behavior of First Forward DN in the SMDI link.
- The IDOVR line option is assigned on a per-line basis by the MSL-100 switch maintenance personnel with knowledge of whether there is a voice mailbox assigned for each DN.
- IDOVR is not supported on Network Message Service (NMS) calls.
- IDOVR is lost if a call is routed over a trunk..
- When a call is transferred, the IDOVR status of any set in the chain prior to the transfer is ignored. With respect to IDOVR, a transferred call is treated as an originating call by the new call forward chain and the other IDOVR rules then apply.
- When this feature is assigned to a line, the system software is not compliant with TR-TSY-000283 for that line.

Interactions

The paragraphs that follow describe how SMDI ID Override interacts with other functionalities.

This feature does have direct interaction with SMDI. If this line option is assigned to a line, it overrides the SLLNKDEV table option LASTFWDN. Therefore, the presence of IDOVR on a line changes the existing functionality of SMDI for First Forward DN or LASTFWDN.

With the SMDI application, the Message Waiting feature on a set gives an indication that a message is being stored in the Voice Message System against it. Since the presence of the IDOVR feature changes the existing functionality of SMDI with First Forward DN or LASTFWDN features, the DN for which the message waiting lamp is to be activated by the SMDI application would also change accordingly. Therefore, the IDOVR feature has indirect interaction with Message Waiting features. Due to MWT, it does have an indirect interaction with Light Two Lamp as well.

When SCMP and Call Forward is active on the line, Call Forward takes precedence and hence IDOVR applies. However, if only SCMP is active IDOVR will not apply.

In a scenario wherein KSH appears on a forwarded call, IDOVR/APP=Y will override the KSH option for forwarding the DN on SMDI links. For example, A forwards to B (with IDOVR/APP=Y), B to C, C KSH to D and D to VMS, then B's DN would be forwarded to SMDI links. More details would be provided in DSUM.

This feature does not have interaction with LOD feature. Therefore, calls terminating on SMDI links with LOD will be processed in the existing way.

Datafill

SMDI ID Override affects data schema tables KSETFEAT and IBNFEAT. See the Customer Data Schema Reference Manual for more information.

Office Parameters

SMDI ID Override does not affect office parameters.

Service orders

SMDI ID Override affects the Service Order System (SERVORD) commands ADO, DEO, CHF, and NEW. See the Service Order Reference Manual for more information.

Operational measurements

SMDI ID Override does not change operational measurements (OM).

Logs

SMDI ID Override does not change logs.

User interface

SMDI ID Override does not change the user interface.

Billing

SMDI ID Override does not generate billing records or changes.

M3900 Release 3 Enhancements

Functionality name

M3900 Release 3 Enhancements

Description: M3900 Release 3 Enhancements

M3900 Release 3 introduces and enhances several features for M3900 sets. The following sections describe these features.

One-Button Feature Access

With One-Button Feature Access, users have more direct access to the following:

- Call Log (Callers List)
- Call Log (Redial List)
- Personal Directory
- Corporate Directory

Callers List

M3900 Release 3 introduces a Callers List soft key for M3903, M3904, and M3905 sets. Press either the soft key or the programmable feature key to go directly to the new callers in the list.

Note: If there are no new callers in your Callers List, when you press the Callers List soft key or programmable feature key, you go directly to the old Callers List.

The system administrator may define the Callers List to the context sensitive of 28. The system administrator may configure a Callers List programmable feature key but the Callers List soft key must be manually removed. If necessary, the system administrator can add the soft key back on the predefined soft key number. This feature may be assigned to programmable keys and context sensitive keys at the same time.

Password protection applies to One-Button Feature Access to the Callers List. If the password is enabled, when you press the Callers List key, a prompt appears requesting password entry. Once you enter the correct password, you can access the “new” Callers List.

Redial List

M3900 Release 3 introduces a Redial soft key for M3903, M3904, and M3905 sets. Press either the soft key or the programmable feature key to go directly to the Redial List.

M3900 Release 3 Enhancements (continued)

The default soft key assignment for the Redial List is 29. However, if the system administrator configures a Redial List programmable feature key, the Redial List soft key is automatically removed. If necessary, the system administrator can add the soft key back on the predefined soft key number.

Password protection applies to One-Button Feature Access to the Redial List. If the password is enabled, when you press the Redial List soft key, a prompt appears requesting password entry. Once you enter the correct password, you can access the Redial List.

Directory/Log key

With M3900 Release 3, the Personal Directory may be accessed with one key stroke. Currently, users press two keys to access the directory, the Directory/Log key and the Select key. With M3900 Release 3, users may start a directory search with the dial pad without pressing the Select key.

The directory application assumes that the Select key has been pressed and processes the search. The Select softkey is still be available for use.

Note: Since there is no Directory/Log hand key on an M3905, the system administrator programs can datafill a programmable line feature key.

Full Duplex Handsfree

A Full Duplex Handsfree accessory for the M3904 Release 3 telephone set will be available with the M3900 Release 3 telephones. It is cartridge type accessory that is hot swappable. It may be added or removed during an established call.

Note: The Full Duplex Handsfree accessory is only complete with a M3904 Release 3 (NTMN34GA or later) telephone set.

Password Clear

The function for clearing the Directory/Call Log password is the same by use of the MSL11 feature RESETPWD, but if the 8-digit value "00000000" (8 zeroes) is entered as the password reset value, then the password is cleared. This allows a user to press the Directory/Call logs without entering a password. The user may then enable Release 3 Password Protection if they are desired.

Full Icon support

MSL-100 system supports the following icons on the M3902, M3903,

M3900 Release 3 Enhancements (continued)

M3904, M3905, KBA, and DBA telephone sets:

- I-Ringing
- I-Active
- U-Active
- I-Hold
- U-Hold

These icons were previously only supported on the M3904, KBA, and DBA.

Corporate Directory Search Enhancement

The Corporate Directory Search Enhancement introduces the Resume soft key to the Corporate Directory screens of the M3903, M3904, and M3905 Release 3 sets. The Resume key allows returning to the Corporate Directory Find screen to enter additional characters and continuing to search without starting over from the beginning.

The Resume key appears on the following Corporate Directory screens:

- List view
- Card view

By pressing the Resume soft key, the Corporate Directory Find screen returns with the previously entered information. This places the cursor at the last entered letter, and users can enter additional letters and press the Done soft key to go to a new point in the directory.

31-Digit Dialing

With the 31-Digit Dialing feature, M3900 Release 3 display screens accommodate dialing strings of up to 31 digits. This allows the screens to fully display long dialing strings, such as Calling Card numbers and access codes.

The M3902 set has a one-line display. Use the Left/Right Navigation keys to scroll through the digits on the line.

M3903, M3904, and M3905 display screens accommodate 24 characters on each line. For dialing strings greater than 24 characters, the number

M3900 Release 3 Enhancements (continued)

automatically wraps to the second line. The following table lists the features that support 31-Digit Dialing on M3902, M3903, M3904, and M3905 sets.

Features that support 31-Digit Dialing

	M3902	M3903	M3904	M3905
Personal Directory			X	X
Call Log		X	X	X
Redial		X	X	X
Predial	X	X	X	X

Note: Currently the PC Utility only supports 24 characters

Call Forward Enhancement for M3900 sets

The Call Forward Enhancement feature modifies the method for activating Call Forward on M3903, M3904, and M3905 Release 3 sets.

To forward your calls or change the previously stored Call Forward number, perform the following steps:

Forwarding calls procedure

- 1 Press the Forward key. The previously stored Call Forward number appears, if one exists.
- 2 If you want to keep the previously stored Call Forward number, press Done. If you want to enter a new Call Forward number, go to Step 3.
- 3 Enter the new Call Forward number.
When you start to enter the new number, the initial Call Forward number automatically deletes.
- 4 You can use the Delete key to delete each digit in the Call Forward number shown. To edit the number, use the Left or Right Navigation keys to move the cursor.
- 5 You can use the Delete key to delete each digit in the Call Forward number shown. To edit the number, use the Left or Right Navigation keys to move the cursor.
- 6 A Cancel key also appears. Press the Cancel key to exit without changing the previously stored Call Forward number.
- 7 Press Done.

M3900 Release 3 Enhancements (continued)

Pause in Dialing String

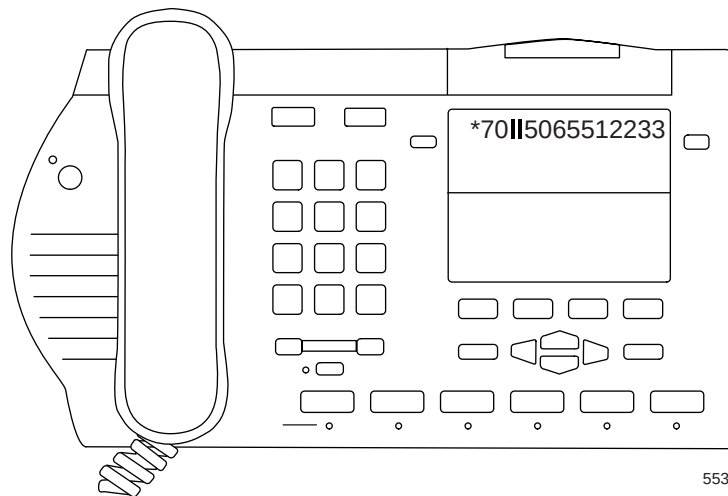
With M3900 Release 3, M3902, M3903, M3904, and M3905 sets support a pause in dialing. This pause is often required when a user dials remote devices, such as answering machines, Interactive Voice Response (IVR) systems, auto attendants, and tandem switches.

The Pause feature enters a 1.5-second delay in a dialing sequence. The user can add the delay while programming or editing an entry in the Personal Directory, Callers List, Redial List, and Predial List.

This feature introduces a Pause soft key. To enter a Pause in the dialing string while editing a number, press the Pause soft key. A Pause place marker appears in the dialing string. The place marker appears as two parallel bars, and takes up one space in the dialing string.

Note: You can enter multiple pauses for longer delays. Currently the PC Utility does not support the pause character.

Example of the Pause place marker in a dialing string



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Special Character Support

With M3900 Release 3, M3902, M3903, M3904, and M3905 sets support special characters found on a PC keyboard. Special character support allows a user to input special characters when using the edit mode in the Personal Directory, Call Log and Redial List. For example, a user can enter a name with an accent in their Personal Directory (for example, Josée).

M3900 Release 3 Enhancements (continued)

The special character set includes all characters from the extended portion of the ASCII character set. The extended ASCII character set that supports the set's current language is the character set that appears in the edit mode. The special character set contains up to 130 characters. It is displayed in six lines with 24 characters on each line. Use the navigation keys to scroll through the list or to move through an individual 24-character line.

The special character set does not include upper and lower case letters or numerals. Use the keypad of the set to define these characters.

Operating parameters

Follow the assignments listed in the following table to configure Context-Sensitive soft keys on M3903, M3904, and M3905 sets.

Context-Sensitive Soft Key default assignments

Key number	Feature
18	Transfer
19	Conference
20	Call Forward
21	Ring Again
22	Call Park
23	Call Pickup
24	Speed Call or System Speed Call
25	Privacy Release
26	reserved for future use
27	reserved for future use
28	Callers List
29	Redial List
30-32	reserved for future use

For M3904 and M3905 sets, One-Button Feature Access keys for the Callers and Redial lists cannot be programmed on a Display Based Accessory (DBA) or a Key-Based Accessory (KBA).

M3900 Release 3 Enhancements (end)

Feature implementation

Refer to the *Service Order Reference Guide* for feature implementation.

Hardware requirements

The Full Duplex Handsfree Accessory requires a new M3904 telephone set (NTMN34GA or later), an Accessory Connection module, and a 110V wall transformer.

Limitations and restrictions

Release 3 features and functionality require the latest firmware to be downloaded to Release 1 and 2 M3902, M3903, M3904, and M3905 telephone sets.

The Full Duplex Handsfree Accessory requires a new M3904 Release 3 telephone set. It is not supported with a Release 2 M3904.

Logs

None.

Service orders

The following new options are being introduced to support Release 3:

- RDLL - Redial List
- CLLG - Call Log

Operational parameters

Not applicable.

Alarms

Not applicable.

Interactions

None.

Command interface

None.

A59024197**Call Forward Enhancements Part I: CFXQUERY CI Tool****Functionality name**

Call Forward Enhancements: CFXQUERY CI Tool

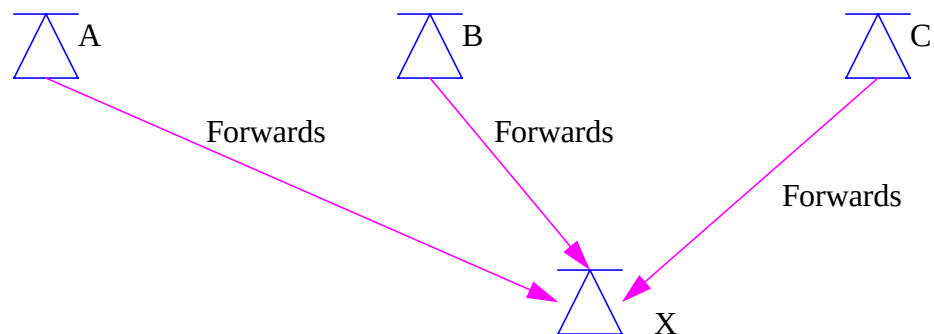
Description: CFXQUERY

CFXQUERY is a CI tool which takes a directory number (DN) in a 10-digit format as input and provides a list of all the line equipment numbers (LENs) that are forwarded to the input DN. The output format provides the following information: the LEN, DN, DN Key, call forward variant and the state of the call forward - active or inactive.

The tool lists a LEN if the forwarded DN is valid and translatable from the LEN as the originating party.

In the following scenario A, B and C have forwarded their sets to set X.

Figure 1 Call Forward Functional Behavior Diagram



Set A has its calls forward to DN 3691350 using Call Forward Universal (CFU). Set B and Set C are forwarded to the same DN 3691350 using Call Forward Do Not Answer - Unrestricted (CFD) and Call Forward Fixed (CFF) respectively.

Prior to development of this feature, the only way to understand which LENs (sets) were forwarded to 3691350 was to check in Table CFX.

Figure 2 Table CFX

```
TABLE: CFX
      CFXLEN      CFUIFVAR
-----
HOST 00 0 00 04 0 N I $ A 1350 I $ I $
HOST 00 1 07 03 0 Y N A 1350 N
HOST 00 1 08 04 0 Y N A 1350 N
```

The CI Tool, CFXQUERY, can be used to list the LENs forwarded to DN 3691350 in real time without querying table CFX. In addition, the output format provides the DN Key, call forward variant and the state of the call forward - active or inactive. Figure 3 gives an example of the output format generated as a result of using the CFXQUERY tool.

Figure 3 CI Tool: CFXQUERY

```
<>CFXQUERY 6133691350
```

```
=====
FOLLOWING LEN(S) ARE FORWARDED TO THE INPUT DN
=====
┌ 00 0 00 04  DN 6133691390 KEY 1  CFX VARIANT: CFD Status: ACTIVE
┌ 00 1 07 03  DN 6133694320      CFX VARIANT: CFU Status: ACTIVE
┌ 00 1 08 04  DN 6133691370 KEY 1  CFX VARIANT: CFF Status: ACTIVE
```

Hardware requirements

No new hardware is needed for this CI tool.

Limitations and restrictions

- The CFXQUERY CI tool does not support Interswitch queries.
- The CFXQUERY CI tool does not support queries on Virtual Directory Numbers (VDNs) such as: Virtual Office Workers (VOW) DNs, Automatic Call Distribution (ACD) DNs, ringing Multiple Appearance Directory Numbers (MADNs), etc.

Logs

Not applicable.

Service orders

Not applicable.

Operational parameters

Not applicable.

Alarms

Not applicable.

Interactions

No interactions.

Command interface

New/modified commands.

Command name	NEW, CHANGED OR DELETED	New name (if renamed)	Directory/MAP level name	MENU/NON-MENU / HIDDEN
CFXQUERY	New	NA	CFXQUERY	Non-Menu

CHANGECFXA59024197**Call Forward Enhancements Part II: CHANGECFX CI Command**

Functionality name

Call Forward Enhancements: CHANGECFX CI tool

Description: CHANGECFX

The CHANGECFX feature is a new CI tool which provides an external means to activate, deactivate, and change the call forward variantdestination directory number (DN) for the following call forwarding variants: CFU, CFI, CFF, CFK, CFB and CFD. Please refer to the glossary for a description of the different call forward variants.

All call forwarding feature information for a set is stored in Table CFX. To change the state of the destination DN or the destination DN itself, the CHANGECFX CI tool can be used to change and update the information in the tuple for the set in table CFX.

The call forward option must be present on the set before the CHANGECFX CI command can be used to activate, deactivate, or change the call forward destination DN.

The details of the call forward, such as the LEN, DN, DN Key status, can be obtained in real-time by using the CI tool CFXQUERY, which is also a part of the new call forward feature enhancements.

An example of how the entire process works using the CFXQUERY and CHANGECFX commands for a set provisioned with the call forward universal (CFU) feature is displayed in the following example.

Figure 1 CFXQUERY and CHANGECFX used together

```
>CFXQUERY 6133691350

=====
FOLLOWING LEN(S) ARE FORWARDED TO THE INPUT DN
=====
| 00 0 15 04 DN 9192461150 KEY 1 CFX VARIANT: CFU Status: ACTIVE
| 00 1 07 03 DN 9192461881      CFX VARIANT: CFU Status: ACTIVE
| 00 1 08 04 DN 6133691370 KEY 1 CFX VARIANT: CFD Status: ACTIVE
```

CHANGECFXA59024197Call Forward Enhancements Part II: CHANGECFX CI Command(continued)

Figure 2 CHANGECDX CI Command output

```
>CHANGECDX:
LEN:
>0 0 15 4
DN_KEY:
>1
CFX_OPTION:
>CFU
CFUFDN:
>2461170
CSTATE:
>A
The Destination DN and its State are updated in Table
CFX
```

Command interface

New/modified commands.

Command name	NEW, CHANGED OR DELETED	New name (if renamed)	Directory/MAP level name	MENU/NON-MENU / HIDDEN
CFXQUERY	New	NA	CFXQUERY	Non-Menu
CHANGECDX	New	NA	CHANGECDX	Non-menu

Hardware requirements

No new hardware is needed for this CI tool.

Limitations and restrictions

The call forward option must be present on the set before the CHANGECDX CI tool can be used to activate, deactivate or change the call forward destination DN.

Logs

Not applicable.

Service orders

Not applicable.

Operational parameters

Not applicable.

CHANGECSXA59024197

Call Forward enhancements Part II: CHANGECSX (continued)

Alarms

Not applicable.

Interactions

No interactions.

A59019809**LDAP Syncing for Meridian SL-100**

Feature name

LDAP Syncing for Meridian SL-100

Description

Lightweight Directory Access Protocol (LDAP) is a specification for a client-server protocol to retrieve and manage directory information. The LDAP Syncing for Meridian SL-100 feature is introduced in MSL15 software release. This feature provides LDAP syncing between the Meridian SL-100 and an LDAP version 3 compliant corporate database.

This feature allows customers to update their authoritative database. This takes advantage of the ability of the higher end digital M3900 series telephones to query a corporate directory server. The LDAP Syncing feature allows the MSL-100 administrator to:

- update corporate LDAP databases with telephone number changes
- update the MSL-100 system with name and/or unique identifier changes made in the corporate LDAP database
- align MSL-100 with other Nortel Network products that synchronize and interwork with LDAP directories
- reduce or eliminate redundant database updates

Functionality

In LDAP Syncing for Meridian SL-100 feature, the MSL-100 will function as an LDAP Client and sync to an LDAPv3 Server. The functionality of the Syncing Client is divided into the following components:

Startup

The startup process will associate all the DNs on the MSL-100 with a Unique Identifier. This Unique Identifier will be used in Syncing the changes.

The initial association of a DN on the MSL-100 with a UNIQUE Identifier on the LDAP Server is done by the subcommand POPULATE of the LDAPCI tool. The TABLE DNATTRS will be updated with a value of 'UNKNOWN' for PUBLIC Network Name. It will then be updated with the actual names present in the LDAP server by the syncing Client.

The startup process will delete all those DNs on the LDAP server that are blank DNs (BLDNs) on the MSL-100 switch.

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LDAP Syncing for Meridian SL-100 (continued)

Continuous Sync

A TCP connection will be opened between the MSL-100 and the LDAP Server using the new CI tool, **LDAPCI**. The IP Address and Port of the LDAP Server will be datafilled in the new table **LDAPTAB**

The Syncing algorithm will sync the MSL-100 with the LDAP Server. DN changes in the MSL-100 will be communicated to the LDAP Server and the NAME changes in the LDAP Server will be communicated to the MSL-100.

Each time a TCP/IP connection is opened with the LDAP server, a maximum of 100 queries will be made to the LDAP server.

Access to the LDAPv3 Server will be authenticated during each query/update to the LDAP Server from the MSL-100.

The syncing will repeat itself based on the datafill of the field FREQSYNC (Frequency of Sync) in table **LDAPTAB**. The syncing client, however, will have to be started manually for the first time through the LDAPCI command START.

In case the LDAP Database goes down then the Shadow Database to the LDAP Server will be updated/queried. The IP Address and the Port No of the Shadow Database will be datafilled in table **LDAPTAB** .

The password for opening the TCP/IP connection is only changed or added through the **LDAPCI** tool. The password will be hidden from the end-user. When the password is corrupted in the switch, a craftsperson can reset the password using the DEBUG tool and resetting the protected store containing the password.

The ESNMAP field in table LDAPTAB is kept for future use and has no role currently.

Hardware requirements

The MSL-100 should be equipped with an EIU and should be in the same LAN as the LDAP corporate database.

A59019809**LDAP Syncing for Meridian SL-100** (continued)**Limitations and restrictions**

The limitations and restrictions that follow apply to LDAP Syncing for Meridian SL-100:

- It is assumed that the name associated with a directory number is stored as one of the following:
 - DISPLAY NAME
 - COMMON NAME
 - FIRST and LAST NAME
 - GIVEN NAME and SURNAME
- The network on which the SL-100 and the LDAP server reside is assumed to be a secure network that does not require the security of KERBEROS authentication.
- Only those directory numbers (DNs) which have been associated with a Unique ID will be kept in sync as the syncing algorithm assumes the presence of a Unique ID for a DN
- Only the components of the LDAP protocol required for syncing will be implemented. After the feature has been completed it cannot be assumed that the MSL-100 is LDAPv3 compliant.
- Only one LDAP server will be synced at a time. If the MSL -100 is being synced with 2 LDAP servers simultaneously, the resulting output will be inconsistent and unpredictable.
- Referrals will not be supported as a part of this feature.
- The USERNAME, PASSWORD (through LDAPCI), BASEDN, and DIGDEL fields in table LDAPTAB should be in single quotes, otherwise the MSL-100 switch will convert everything to UPPER CASE.
- Blank characters are not accepted in the USERNAME and BASEDN fields of table LDAPTAB. A PIPE (|) should be entered where blank characters are needed within the USERNAME or BASEDN fields. Syncing Client will internally convert them to blanks
- During each syncing session, a maximum of 1000 MSL-100 DN changes will be updated in the LDAP Server. All the tuple deletions in DNATTRS will be queued. This queue can take up a maximum of 1000 changes. A tuple deletion in table DNATTRS after the 1000th tuple deletion will, therefore, not be queued. The change will, consequently, be lost and not reflected in LDAP server. This effectively means that only 1000 DN changes on the MSL-100 can be updated in the LDAP Server for every

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LDAP Syncing for Meridian SL-100 (continued)

syncing session. Parameter freqsync in table LDAPTAB overcomes this limitation.

Interactions

This feature will interwork with all features conforming to LDAP Version 3.

Datafill

A55019809 Data Schema

New or modified tables

Table Name	NEW, CHANGED or DELETED	Table Control (NEW/OLD/UNCHANGED)
LDATAB	NEW	NEW

LDAP Syncing for Meridian SL-100 creates a new Data Schema table, Lightweight directory access protocol table (LDAPTAB). This table will be stored in PROTECTED Store.

This feature allows customers to change name and/or unique identifiers on the MSL-100 switch and DNs on the LDAP server. This feature aligns the Meridian SL-100 with other Nortel Network products that are synchronizing and interworking with LDAP directories.

LDAPTAB stores information that is used by the syncing client to establish a connection to the LDAP server and to perform required operations.

Refer to the *Data Schema Reference Manual* for more information.

Office Parameters

LDAP Syncing for MSL-100 does not change Office Parameters.

Service orders

LDAP Syncing for Meridian SL-100 introduces a new line option, UNIQID. UNIQID associates a DN with a unique identifier. The unique identifier is used to sync the Meridian SL-100 switch with the LDAP version 3 server. This feature can be provisioned on the following telephone sets:

- Meridian Business Set (KSET)
- Integrated Voice and Data (IVD)

A59019809**LDAP Syncing for Meridian SL-100** (continued)

- Integrated Business Network (IBN)
- Integrated Services Digital Network (ISDN)
- Residential Enhanced Services (RES)

LDAP Syncing for Meridian SL-100 affects the Service Order System (SERVORD) commands ADO, DEO, CHF, and NEW.

Refer to the *Service Order Reference Manual* for more information.

Alarms

LDAP Syncing for MSL-100 does not affect alarms.

Operational measurements

LDAP Syncing for MSL-100 does not change operational measurements (OMs).

Logs

LDAP Syncing for Meridian SL-100 generates a new log, **LDAP**.

The reason for generation of LDAP00x is:

- 001: The Unique id is not found in the LDAP version 3 Server or is duplicated in the LDAP server.

This will happen when a uniqueid datafilled on a DN on MSL-100 switch is not found in the LDAP server or a uniqueid datafilled on a DN in MSL-100 switch is found in more than one entry in the LDAP server.

- 002: the LDAP operation has failed

This will happen if any operation from the syncing Client to the LDAP version 3 server fails during syncing or during the startup process.

- 003: the TCP connection could not be opened

This will happen if the TCP connection between the Meridian SL-100 and the LDAP Server could not be opened due to authentication failure or the LDAP Server being down.

- 004: the syncing process has started

This log will be generated when the syncing process starts.

- 005: the syncing process has completed

This log is generated when the syncing process has completed one sync cycle or the startup process has completed successfully.

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LDAP Syncing for Meridian SL-100 (continued)

New or modified Logs

Log name	Log number	NEW, CHANGED or DELETED
LDAP	001	NEW
LDAP	002	NEW
LDAP	003	NEW
LDAP	004	NEW
LDAP	005	NEW

Refer to the *Logs Reference Manual* for more information.

Command interface

New or modified commands.

Command name	NEW, CHANGED OR DELETED	New name (if renamed)	Directory/MAP level name	MENU/NON-MENU / HIDDEN
LDAPCI	NEW			Non-menu

Directory: LDAPCI

This directory will be used to support all CI commands for syncing the LDAP server with the MSL-100 switch. The commands under this directory are:

- START
- STATUS
- STOP
- PASSWD
- POPULATE
- REPORT
- QUIT

Refer to the *Feature Description Reference Manual* for more information on these commands.

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Call Forward enhancements: CFXQUERY CI Tool (continued)

AMA/Billing

This feature does not affect billing or AMA logs.

List of terms

ac

See alternating current.

ACB

See Automatic Call Back.

ACD

See Automatic Call Distribution.

ADSI

See analog display services interface.

A-Law

The method of encoding sampled audio waveforms used in the 2048 kilobits per second 30-channel pulse code modulated primary system used mostly in non-North American countries. For example, Europe uses this method.

ALT

See automatic line test.

alternating current (ac)

Alternating current is an electric current that reverses its direction at regularly recurring intervals.

AMA

See automatic message accounting.

American Wire Gauge (AWG)

American Wire Gauge is a standard American method of classifying wire diameter.

AMIS

See audio messaging interchange specification.

ANA

See automatic number announcer.

analog display services interface (ADSI)

A feature used to distinguish between the audio and visual types of access for visual screen list editing (VSLE). Also referred to as a protocol that allows softkey data to be transferred to an ADSI set on an application-specific basis.

analog message waiting line card (MLC)

The MLC functions the same as an ALC that supports message waiting lamp sets in addition to the 500/2500 sets. The MLC can be inserted into any line card slot in the IPE shelf. Each MLC supports a maximum of 16 analog sets with message waiting lamps and can support the attendant console.

ANI

See automatic number identification.

ANSI

American National Standards Institute.

application specific unit (ASU)

The first subsystem in an external link peripheral processor (LPP) cabinet contains a group of three link interface shelves (LIS) that house modular, add-in cards known as application specific units. Examples of ASUs are the link interface unit (LIU) for Common Channel Signaling 7 (CCS7) applications and the X.25/X.75/X.75' link interface unit (XLIU) for DMS packet handler applications. Another type of ASU, the network interface Unit (NIU), uses DS30 links to route messages between the ASUs in the LPP and the Enhanced Network (ENET).

AR

See Automatic Recall.

ASU

See application specific unit.

asynchronous transfer mode (ATM)

A type of data transfer allowing the transfer of multimedia traffic over networks.

ATA

Analog terminal adapter. A terminal type that adds an analog port to a digital terminal. The ATA has the same interface and control into the MSL-100 system as the existing M2006 phone set.

ATC

Applied Technology Council

ATM

See asynchronous transfer mode.

ATT

See automatic trunk test.

audio messaging interchange specification (AMIS)

AMIS allows networking among non-Meridian mail users without predefining any of the remote sites. A message can be addressed to any subscriber using a direct dial system access number and a unique mailbox identifier. AMIS networking is available with MMUI or VMUIF.

Automatic Call Back (ACB)

A CLASS feature that allows the user to dial a feature code that automatically sets up a call to the last directory number (DN) that was dialed from that set. If the call cannot be completed immediately because of a busy line, call completion is attempted when both stations are idle.

Automatic Call Distribution (ACD)

ACD provides the capability of distributing a large number of incoming calls placed to one or more central directory numbers among a fixed group of agent positions. This configuration results in a call management system suitable for service industries where a large number of incoming calls are answered by a group of agents.

automatic line test (ALT)

The automatic line test provides a simple method for testing large numbers of lines. Currently the following tests are available: transhybrid loss test, line card diagnostic, line insulation test, and on-hook balance network. These tests can be run immediately or scheduled for daily operation.

automatic message accounting (AMA)

Automatic message accounting is an automated recording system that documents all the necessary billing data of subscriber-dialed long distance calls.

automatic number announcer (ANA)

The automatic number announcer returns a recorded voice announcement of the calling number.

automatic number identification (ANI)

A system whereby a calling number is identified automatically and transmitted to the automatic message accounting (AMA) office equipment for billing.

automatic recall (AR)

A CLASS feature that allows a user to dial a feature code that places a call to the last station that called the user. If the destination line is busy, call completion is attempted when both stations are idle.

automatic trunk test (ATT)

The automatic trunk test provides the prime method for detecting operational failures during light- or no-traffic periods when per-call failure detection is inactive. Automatic trunk testing generates sufficient test calls during low-traffic periods so that failures can be detected in the voice or data path modules, such as peripheral modules, network modules, facility routes, and the distant switching system.

AWG

See American Wire Gauge.

basic rate interface (BRI)

Basic Rate Interface refers to a type of access to ISDN service provided by a set of time-division multiplexed digital channels of information, including two B-channels, one D-channel, and one or more maintenance channels, often described as 2B+D. Basic rate interface is typically used on lines between customer premises and the host switch.

batch change supplement (BCS)

A batch change supplement refers to a software release.

battery return (BR)

Battery return is a conductor that carries the -48 V return current.

BCLID

See Bulk Calling Line Identification.

BCS

See batch change supplement.

BPG

building principle ground

BR

See battery return.

BRI

See basic rate interface.

BRISC

BNR reduced instruction set computing.

BRR

battery return reference

building principle ground (BPG)

The main point within a building at which the ground potential is established. The BPG is directly connected to earth by water pipes or electrodes driven into the earth.

bulk calling line identification (BCLID)

A feature that provides information about calls to members of a BCLID group. It allows data to be collected in one central location for all calls received by lines that are members of the group. The BCLID group is defined through datafill and can have from one to 16 data link assigned.

cabinetized integrated services module (CISM)

The CISM is a modular, standard-wired cabinet with shelves that contain up to four integrated service modules.

cabinetized international peripheral equipment (CIPE)

The CIPE is the international version of the cabinetized control peripheral equipment (CCPE). It contains two dual-shelf extended peripheral modules configured as either line group controllers (LGC) or digital trunk controller (DTC). Each shelf contains two LGC/DTC processor boards. The CIPE connects to the network through either DS30 trunks or DS512 trunks.

cabinetized miscellaneous spares storage (CMSS)

A cabinet used for spare card storage.

cabinetized multi-vendor interface (CMVI)

The CMVI cabinet contains two main SMA2 shelves and one SMA2 extension shelf that supports the main shelves. The CMVI cabinet supports up to 96 P-side DS1 links.

Call Center Management Information System (CCMIS)

The CC MIS is a powerful, flexible, and user-friendly call center management tool for the Meridian SuperNode ACD call center. It is designed for call centers comprising either traditional Meridian ACD groups or larger supergroup configurations served by a single Meridian SuperNode.

call forward busy (CFB)

CFB permits all calls to a busy station to be forwarded to a destination station within the customer group.

call forward don't answer (CFD)

CFD permits an incoming call not answered within a specified length of time to be forwarded to another designated station.

call forward fixed (CFF)

CFF permits stations to forward calls only to locations initially entered by the Telephone Operating Company. This does not allow users to program the forwarding numbers.

call forward universal (CFU)

CFU permits stations to forward calls to user defined locations inside or outside of the customer group.

Call forwarding per key (CFK)

The CFK feature allows the user to forward each DN on the Meridian Business Set to different destinations.

call processing (CP)

Call Processing refers to the software system that handles the processes involved in setting up connections through the network between calling and called parties.

calling line identification (CLID)

An advanced networking service allowing a called terminal to be notified by the network of the address from which the call has originated.

calling number delivery (CND)

A CLASS feature that shows, for each incoming call, the DN of the calling party and the date and time of the call. The calling party's DN is displayed in ten-digit format.

calling number delivery blocking (CNDB)

A CLASS feature for outgoing calls that allows users to block the display of their DN on the set of a called party.

cancel call waiting (CCW)

A feature that allows a calling party to prevent (block) incoming calls from activating the call waiting feature.

CBN

common bonding network

CCC

See central control complex.

CCM

DMS-100 Common. A layer within the DMS-100 software used by MSL-100 software and features.

CC MIS

See Call Center Management Information System.

CCS

See Common Channel Signaling.

CCS7

See Common Channel Signaling 7.

CD-ROM

See compact disc-read-only memory.

central control complex (CCC)

The NT40 system consists of the central control complex, which performs call processing and other operations for the system. The CCC is duplicated for reliability with one plane being in-service (active) while the other plane (standby) checks for variations between itself and the active plane. The CCC consists of the following elements: central processing unit (CPU), program store (PS), data store (DS), and central message controller (CMC).

central message controller (CMC)

The central message controller, which is part of the NT40 central control complex (CCC), controls the flow and priority of messages between the other units of the CCC and the network message controller (NMC) in the Network Module (NM) or the input/output controller (IOC).

central office data processor (CODP)

An adjunct processor attached to the stored program controller (SPC) whose function is to maintain transaction capability application part (TCAP) links to DMS switches.

central processing unit (CPU)

The central processing unit, which is part of the NT40 central control complex (CCC), acts as the central processor for the Meridian SuperNode system. The CPU has access to memories where stored programs and network data are located. The CPU uses this data to decide what action is required to satisfy the needs of the network and issues the commands to carry out the action.

CI

See command interface.

CIPE

See cabinetized international peripheral equipment.

CISM

See cabinetized integrated services module.

CLASS

See Custom Local Area Signaling Service.

CLID

See calling line identification.

class modem resource (CMR)

The card used by CLASS features to transmit calling number and name information.

class of service (COS)

A COS is a template containing information about subscriber mailbox capabilities. Values are assigned to specific parameters for these capabilities. A subscriber can be assigned to a personal COS or to 1-15 system COS to which the subscriber belongs.

CM

See computing module.

CMC

See central message controller.

CMS

Call Management Service. *See* Custom Local Area Signaling Service.

CMSS

See cabinetized miscellaneous spares storage.

CMVI

See cabinetized multi-vendor interface.

Codec

The encoder-decoder board for the video signal. It has its own video conferencing processor for fast quality encoding to send video conferencing audio and video signals, and to decode the incoming audio and video signals. This is the hardware that makes the difference in quality between video conferencing systems that use a codec versus those that try to accomplish the call processing using only the personal computer's processor.

CODP

See central office data processor.

command interface (CI)

The command interface component refers to a support operating system that functions as the main interface between the machine and the user. The major roles of the CI component include the following functions:

- reading lines entered by a terminal user
- breaking each line into recognizable units

- analyzing the units
- recognizing command item-numbers on the input lines
- activating these commands

Common Bonding Network (CBN)

Common Bonding Network is the principle means of bonding and grounding inside a telecommunications building. It consists of all metallic components that are interconnected to form the principle bonding network in the building. A common bonding network has a mesh configuration and is connected to the grounding electrode system.

Common Channel Signaling (CCS)

Common Channel Signaling refers to a signaling method in which a single channel conveys, by the means of labeled messages, signaling information relating to a multiplicity of circuits and other information. No supervision or addressing appears on individual trunks, they are used for voice only.

Common Channel Signaling 7 (CCS7)

Common Channel Signaling 7 is a digital, message-based network signaling standard defined by the CCITT that separates call signaling information from voice channels so that interoffice signaling is exchanged over a separate signaling link.

common peripheral controller (CPC)

The Meridian cabinet trunk module-ISDN (MCTM-I) cabinet contains up to two duplicated common peripheral controllers that can be configured as a line trunk controller-ISDN (LTC-I), line group controller-ISDN (LGC-I), or digital trunk controller-ISDN (DTC-I). The CPCs are wired as an LTC-I to eliminate custom engineering, but can be configured as an LGC-I or DTC-I with the appropriate circuit packs.

common peripheral module (CPM)

A family of peripheral modules used in the Meridian SuperNode system. The CPM replaces the XMS-based peripheral module (XPM).

Compact Disc-Read-Only Memory (CD-ROM)

CD-ROM is a technology on which Nortel Networks provides the latest Nortel Networks technical publications (NTP). Extensive search functions allow the user to search quickly virtually every word of every document. One CD-ROM stores approximately 200,000 pages of text and graphics.

Companion

A wireless phone set that works with Nortel Networks' line of PBXs.

computer-telephony integration (CTI)

The convergence of telephone voice communication systems and computer technology.

computing module (CM)

The computing module is part of the SuperNode Core that performs call processing functions. The computing module, which is housed in the dual plane combined core (DPCC) cabinet, contains two CM planes. Each plane contains the following elements: processor used for call management, message switch (MS) interfaces, reset terminal interface, and memory circuit packs.

coordinated voice and data (CVD)

A switch-to-computer application interface (SCAI) option which provides an agent with a screen of information about a caller at the same time the call is being received. The agent is able to speak on the telephone while examining call-related information on the desktop terminal.

COS

See class of service.

COT

See customer oriented trace.

CP

See call processing.

CPC

See common peripheral controller.

CPDC

See cabinetized power distribution center.

CPE

See customer premises equipment.

CPM

See common peripheral module.

CPU

See central processing unit.

CTI

See computer-telephony integration.

Custom Local Area Signaling Service (CLASS)

CLASS, sometimes referred to as call management service (CMS) in Canada, is a set of advanced calling capabilities which offer convenience and control beyond custom calling features. This feature enhances the signaling capabilities of analog stored program controller (SPC) switches to integrate some CCS7-based network features such as calling number display, automatic call setup, and screening list editing features.

customer oriented trace (COT)

A CLASS feature that allows the user to dial a feature code to generate a trace report for the last incoming call. The report supports a customer complaint about a malicious call.

customer premises equipment (CPE)

Nortel Networks telephony equipment located at the customer's site. A CPE carrier is a private businesses that does not have its own PBX but does have its own MSM and maintains its own voice messaging system.

CVD

See coordinated voice and data.

data communications equipment (DCE)

See data circuit-terminating equipment.

Data Circuit-terminating Equipment (DCE)

The equipment that provides the functions required to establish, maintain, and terminate a connection as well as the signal conversion required for communications between the data terminal equipment (DTE) and the telephone line or data circuit. Also known as data communications equipment, data set.

data link connection identifier (DLCI)

A unique two-byte code included in each data packet. By identifying the logical connection to which the packet belongs, it lets many virtual channels share a single physical channel (for example, a non-channelized T1).

data modification order (DMO)

A data modification order is a request to switch personnel to change system information.

data packet network (DPN)

A packet-switched networking system that is manufactured by Nortel Networks. The DPN-100 data networking system is an enterprise-wide data communications system for the interconnection of host, applications, and end-user environments.

data store (DS)

The data store module, which is part of the NT40 central control complex (CCC), contains transient information on a per-call basis, customer data, and office parameters.

D-channel handler (DCH)

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

dc

See direct current

DC

See device controller.

DCE

See data communications equipment.

DCH

See D-channel handler.

DDN

See dialable number delivery.

DDU

See disk drive unit.

Defense Switched Network (DSN)

The telephone network used by government agencies.

device controller (DC)

Input/output controllers (IOC) use the device controllers to communicate with input/output devices.

device independent recording package (DIRP)

DIRP is a utility that manages the reading and writing of data between various subsystems and recording devices.

dialable number delivery (DDN)

A CLASS feature that delivers the DN of the calling party in a dialable format and the date and time of the incoming call to a calling number delivery (CND) set.

dialable wideband service (DWS)

Dialable wideband service is Nortel Networks' multirate ISDN switched service aimed at satisfying end-user needs for flexible, wideband connectivity. It provides a simple way to extend existing ISDN services to match the higher bandwidth requirements emerging for videoconferencing, multimedia, imaging, and other high-speed applications. DWS bridges the gap between narrowband services (< 64 kbp) and broadband services (> 1.536 Mbp). DWS offers a flexible, dialable, real-time network connection with rates from 128 kbit/s to 1.536 Mbit/s in 64-kbit/s increments.

digital line card (DLC)

The DLC is a digital line card that interfaces to Meridian integrated voice and data (IVD) digital terminals. These terminals include the M2000 series, the M3000 Touchphone, and their respective data options. The DLC inserts into any line card slot on the intelligent peripheral equipment (IPE) shelf and can interface with a maximum of 16 digital sets for each DLC card for a total of 32 ports.

digital line module (DLM)

The digital line module is a 23-position peripheral module developed to allow the Meridian SuperNode system to interface with the M2000 series of telephone sets.

digital recorded announcement machine (DRAM)

The digital recorded announcement machine is a peripheral module in which voice messages are stored in digital form, providing access to up to 30 different service voice announcements.

digital trunk controller (DTC)

The digital trunk controller is a peripheral module that connects DS30 links from the network with digital trunk circuits.

digital trunk controller-ISDN (DTC-I)

The digital trunk controller-ISDN is a peripheral module that connects DS30 links from the network with digital trunk circuits and that supports ISDN packfill.

DIOC

dual input/output controller

direct current (dc)

Direct current is an electric current flowing in one direction only and substantially constant in value.

DIRP

See device independent recording package.

disk drive unit (DDU)

A disk drive unit consists of two 8-inch or 5.25-inch Nortel disk units, providing 220 to 440 Mbytes of formatted storage. The DDU is housed in the Meridian cabinet general module (MCGM), the Meridian cabinet auxiliary module phase 3 (MCAM3), or the cabinetized integrated services module (CISM). The MCGM is manufacture discontinued and is replaced with the MCAM3 or the CISM.

distinctive ringing/call waiting (DRCW)

A feature that identifies certain terminating calls by a distinctive pattern of alerting: a distinctive ring (long, short, long) or, if busy, a distinctive call waiting tone (short, long, short). The caller receives a standard audible ringback tone.

DLC

See digital line card.

DLCI

See data link connection identifier.

DLM

See digital line module.

DMO

See data modification order.

DN

Directory number. A number assigned to a telephone set on the MSL-100 system.

DPCC

See dual plane combined core.

DPN

See data packet network.

DRAM

See digital recorded announcement machine.

DRCW

See distinctive ringing/call waiting.

DS

See data store.

DSN

See dual shelf network.*See* Defense Switched Network.

DTC

See digital trunk controller.

DTC-I

See digital trunk controller-ISDN.

dual plane combined core (DPCC)

The dual plane combined core is the SuperNode core cabinet that packages the following components: a dual-plane message switch (MS), a computing module (CM), and a system load module (SLM).

dual shelf network (DSN)

The dual shelf network, which is housed in the NT40 Meridian cabinet core module (MCCM) cabinet, initially provides 64 Peripheral-side (P-side) ports with a capability to add 64 more.

dual tone multi-frequency (DTMF)

A service-related telephony dialing feature that allows address information to be generated from a telephone set in the form of DTMF signals by pressing non-locking buttons. Contrast with pulse dialing.

DWS

See dialable wideband service.

EAP prefix

A prefix (10xxx) that accesses either a feature group C or feature group D carrier. The first two digits (10) of the prefix form a reserved access code. The EAP prefix is either dialed by the subscriber or added by the system software.

EBS

See electronic business set.

ECM

See extended call management.

EDCH

See enhanced D-channel handler.

EDRAM

See enhanced digital recorded announcement machine.

EIU

See ethernet interface unit.

EKTS

See electronic key telephone systems.

ELD

See enhanced line drawer

electromagnetic interference (EMI)

Electromagnetic Interference refers to the phenomenon that results when electromagnetic energy causes an unacceptable or undesirable response, malfunction, degradation, or interruption of the intended operation of the electronic equipment, subsystem, or system.

electronic business set (EBS)

The electronic business set is a telephone set that provides subscribers with pushbutton access to various business features.

electrostatic discharge (ESD)

Electrostatic discharge is a transfer of an electrostatic charge either caused by direct contact between two bodies that are at different electrostatic potentials or induced by an electrostatic field.

electronic key telephone systems (EKTS)

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

ELM

See enhanced line module.

EMAP

See enhanced MAP workstation.

EMC

See enhanced miscellaneous cabinet.

emergency standalone (ESA)

Emergency standalone refers to an emergency service that permits local calling within a remote peripheral in the event of a loss of communication with the host office.

EMI

See Electromagnetic Interference.

EMPC

See enhanced multiprocessor controller.

ENET

See enhanced network.

Enhanced D-channel handler (EDCH)

A card in an ISDN line group controller (LGC) or in an ISDN line trunk controller (LTCI) that provides the primary interface to all D-channels. The EDCH also perform Q.921 LAPD layer 2 processing. It is connected permanently to an ISDN loop, and receives or sends messages on the signaling and packet data channel.

enhanced digital recorded announcement machine (EDRAM)

The EDRAM offers service providers time and cost savings by automating the process of providing instructions to a subscriber during a call. A single EDRAM circuit pack offers the same functionality of a 13-card Digital Recorded Announcement shelf, including enhancements in audio quality, reliability, and flexibility.

enhanced line drawer (ELD)

An enhanced hardware device in the line module and line concentrating module (LCM) that contains line circuit (LC) cards.

enhanced line module (ELM)

The enhanced line module, which is housed in the Meridian cabinet line module (MCLM) cabinet, contains 8 line drawers, which house 512 line cards. All four line drawers on each MCLM shelf are located on the left side, while the control equipment is located on the right side. This arrangement allows easier removal of line cards from the drawers.

enhanced MAP (EMAP) workstation

The enhanced MAP workstation combines the functionality of the MAP visual display unit (VDU) and a compact disc-read-only memory (CD-ROM) drive into one workstation. This workstation provides Meridian SuperNode

technicians with the ability to perform tasks on the MAP window and access Helmsman software simultaneously.

enhanced multipurpose cabinet (EMC)

A cabinet containing one or more single shelf link peripheral processors (SSLPP).

enhanced multiprocessor controller (EMPC)

An enhanced data communications card that allows data communications between a DMS-100 switch and an external computer.

enhanced network (ENET)

The enhanced network is the new generation of switching networks that replaces the junctored network modules. The ENET is a nonblocking, junctorless, single-stage time switch that can expand its capacity from 4K to 128K unidirectional channels. The ENET is available in a 64K single-cabinet or 128K dual-cabinet configuration. The ENET is also available as an optional 16K ENET shelf in the SuperNode Combined Core (SCC) cabinet for SuperNode SE systems.

enhanced service providers (ESP)

A third-party vendor supplying value-added services to the subscriber.

ESA

See emergency standalone.

ESD

See electrostatic discharge.

ESMA

enhanced subscriber carrier module-100 access. *See* subscriber carrier module-100 access, second version.

ESP

See enhanced service providers.

ETAS

See emergency technical assistance service.

Ethernet interface unit (EIU)

An application specific unit (ASU) that connects the MSL-100 switch to the local area network.

extended call management (ECM)

An application such as CompuCALL allowing concurrent delivery of voice calls and data from the user's host computer to an answering automatic call distribution (ACD) agent.

extended Multiprocessor System (XMS)

A workstation-based microcomputer with networking capabilities based on a Motorola 68000 microprocessor with system software written in Bell-Northern Research (BNR) Pascal.

extended system monitor (XSM)

The extended system monitor is a microprocessor-based circuit pack located in the intelligent peripheral equipment (IPE) pedestal base. The XSM monitors the operation and status of the IPE power supplies, ringing generators, column thermal sensors, and blower units.

FCC

See Federal Communications Commission.

Federal Communications Commission (FCC)

The FCC is a board composed of seven commissioners with the power to regulate all interstate and foreign electrical communications systems originating in the United States, including radio, television, facsimile, telegraph, telephone, and cable systems.

fiber central office terminal (FCOT)

A component of the S/DMS AccessNode that terminates connections from service nodes and fiber optic transmission facilities from remote fiber terminals (RFT). The primary function of the FCOT is to convey traffic arriving on the fiber optic transmission facilities to the appropriate service nodes and to direct traffic arriving from the service nodes to the proper fiber optic transmission facilities.

FCOT

See fiber central office terminal.

FG

frame ground

FLIS

fiber link interface shelf. *see* single shelf link processor (SSLP).

frame ground (FG)

A metallic connection to the earth to establish zero potential or voltage with respect to ground or earth.

frame relay

An approach to packet switching that offers faster access speeds and higher performance than X.25-based packet switching.

frame relay interface unit (FRIU)

A relay interface unit that supports DataSPAN frame relay services by providing the physical connection for T1 carriers at the LPP. DataSPAN uses T1 carriers as its transmission facilities and the FRIU terminates the T1 carriers at the switch. The FRIU analyzes incoming frames and addresses them for routing to the LIM unit. DataSPAN, loaded into each APU at datafill, allows LANs from different locations to be logically connected into a single data network.

frame relay service

The global term used to describe the system defined by the CCITT recommendation I.122.

frame supervisory panel (FSP)

The frame supervisory panel distributes and controls power and alarms in a cabinet.

FRIU

See frame relay interface unit.

FRS

See frame relay service.

FSP

See frame supervisory panel.

FST

An optional package with 48 to 96 lines connected to its host AccessNode over DS-1 links providing the ability to provision or change services through software instructions, without on-site visits to the network element.

GND

ground

GP

general purpose. *See* modular option (GP).

GUI

graphical user interface. The way information appears on a workstation monitor for easy user access. A GUI consists of buttons, pull-down menus, and toolbars.

HABC

See high availability bus controller.

HDLC

See high-level data-link control.

HIE

See host interface equipment shelf.

high availability bus controller (HABC)

A bus controller card providing 2 Mbyte of RAM storage for programs and data and contains circuitry that allows interconnection of nodes in multi-node configurations through an external bus or DVS bus.

high-level data-link control

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

host interface equipment (HIE) shelf

A single shelf that allows the line concentrating array (LCA) shelves to connect to both the remote maintenance module (RMM) and the host office.

IBN

isolated bonding network.

IBN

integrated business network. Refers to analog phones with no display, usually 500/2500 sets.

IEC

See Interexchange Carriers.

input/output controller (IOC)

input/output controllers interface between the various input/output devices used for maintenance and administration purposes and the messaging

component (the NT40 central message controller or the SuperNode and SuperNode SE message switch bu).

input/output device (IOD)

The input/output device subsystem monitors the input/output controllers and provides access to the Meridian Supernode system for maintenance and administration. Typical input/output devices include the MAP workstation (and other visual display unit), printers, magnetic tape drives, and disk drive units.

Integrated Service Digital Network (ISDN)

ISDN is a collection of standardized national and international digital telecommunications interfaces and signaling protocols that provide digital circuit-switched voice and data, as well as packet-switched data services.

integrated voice and data (IVD)

The integrated voice and data service provides simultaneous voice and data communications at speeds up to 19.2 kbps over a single, twisted-pair subscriber loop.

intelligent peripheral equipment (IPE)

The IPE is a single-shelf module containing a controller card and 16 slots available for analog and integrated voice and data (IVD) digital lines. IPEs are packaged as modular, stackable units. Up to four IPEs can be contained in one intelligent peripheral equipment column (IPEC). The IPE also provides a simplex, single common peripheral with common line cards for the Meridian SuperNode system, SL-1, and Meridian SuperNode system, as well as a cost-effective solution for system upgrades and extensions.

intelligent peripheral equipment column (IPEC)

The IPEC houses all equipment for IPE functionality, which includes up to four universal equipment modules (UEM), up to four IPE modules, a pedestal base, an expansion kit, two module side cover panels, a top cap, cable harnesses, trim panels and labels, and the Extended System Monitor (XSM) card.

interactive voice response (IVR)

IVR is a generic term given to applications which allow callers to interact directly with information stored in computer databases using a touchtone phone. The typical IVR application initiates a predefined sequence of verbal prompts, providing options and instructions to the caller. It allows the caller to respond to these verbal prompts and instructions via their telephone touchtone keys as if the keys were on the keyboard of a computer terminal. In this way, information inquiries and transactions can be carried out directly by the caller with no need for additional human intervention or terminal interface.

Nortel Networks provides two interactive voice response systems (IVR): Meridian IVR and OPEN IVR.

intraswitching

A service in which calls are switched within one double-bay remote line module (RLM) frame without using the host office switching network.

interexchange carriers (IEC)

Any carrier authorized to carry customer transmissions between local access and transport areas (LATA) interstate or intrastate.

IOC

See input/output controller.

IOD

See input/output device.

IPE

See Intelligent peripheral equipment.

IPEC

See intelligent peripheral equipment column.

ISDN

See Integrated Services Digital Network.

ISDN User Part (ISUP)

A Common Channel Signaling 7 (CCS7) message-based signaling protocol that acts as a transport carrier to ISDN services. The ISUP provides the functionality in a CCS7 network for voice and data services.

isolated bonding network (IBN)

A bonding network that has a single point of connection to either the common bonding network or to another IBN.

ISUP

See ISDN user part.

ITU

International Telecommunications Union.

IVD

See integrated voice and data.

IVR

See interactive voice response.

JNET

See junctored network.

junctored network (JNET)

The junctored network employs four stages of time switching for each voice connection between the originating and terminating peripheral modules. JNET hardware is housed in the Meridian cabinet network module (MCNM) cabinet and is applicable to NT40 systems.

L+

positive line voltage

L-

negative line voltage

LAPD

See link access procedure on the D-channel.

LATA

See local access and transport area.

LCA

See line concentrating array.

LCD

liquid crystal display. A low power display that aligns material suspended in a liquid under the influence of a low voltage so it reflects ambient light and displays alphanumeric characters. LCD displays are finding great use as methods of displaying information on electronic telephones, especially those positioned behind a PBX.

LCM-E

See line concentrating module-enhanced.

LED

See light-emitting diode.

LEN

See line equipment number.

LFC

LIS Fbus controller

LFI

LIS fiber interface

LGC

See line group controller.

LGC-I

See line group controller-ISDN.

light-emitting diode (LED)

The LED is a solid-state device that emits light when the appropriate voltage is applied to it. Several LEDs are used in components as front panel indicators. They are usually off when the status of the equipment is normal.

line concentrating array (LCA)

A unit of the line concentrating module (LCM). An LCM has two LCA shelves.

line concentrating module-enhanced (LCM-E)

The line concentrating module-enhanced is a dual unit peripheral module that terminates ISDN lines, electronic business set (EBS) lines, and Datapath lines. The LCM-E occupies two shelves in the Meridian cabinet line module-ISDN (MCLM-E) and supports a total of eight physical line drawers.

line equipment number (LEN)

The LEN provides a seven-digit function reference used to identify line circuits. The LEN provides physical location information on equipment such as site, frame number, unit number, line subgroup (shelf), and circuit pack.

line group controller (LGC)

A peripheral module (PM) that connects DS30 links from the network to line concentrating modules (LCM).

line group controller-ISDN (LGC-I)

The line group controller-ISDN is a peripheral module that connects DS30 links from the network to the line concentrating module (LCM). The LGC-I is essentially the same as the LTC-I; however, the LGC-I adds line support.

line test position (LTP)

The line test position provides the tools and functions required to locate and verify faults and checks that corrective action is successful. The Line Test Position consists of four MAP workstation levels: LTP, LTPLTA, LTPDATA, and LTPMAN.

line test position data (LTPDATA)

The LTPDATA is a MAP workstation level under the line test position (LTP) area that provides line transmission test tools for ISDN basic rate interface (BRI) lines.

line test position local test access (LTPLTA)

The LTPLTA is a MAP workstation level under the line test position (LTP) area that provides facility tests.

line test position manual (LTPMAN)

The LTPMAN is a MAP workstation level under the line test position (LTP) area that provides line transmission test tools.

line trunk controller (LTC)

A peripheral module (PM) that is a combination of the line group controller (LGC) and the digital trunk controller (DTC) and provides all the services offered by both. It supports line concentrating module (LCM) and AB trunks.

line trunk controller-ISDN (LTC-I)

The line trunk controller-ISDN is a peripheral module that is a combination of the line group controller and the digital trunk controller and provides all the services offered by both. The LTC-I is wired to support up to 8 line concentrating modules (LCM) or digital line modules (DLM) requiring up to 20 DS-30A trunk ports and 16 DS30 line ports.

link access procedure on the D-channel (LAPD)

An ISDN access protocol used with links established on a D-channel.

link interface shelf (LIS)

The link interface shelf is a single-shelf link peripheral processor that houses modular, add-in cards known as application specific units (ASU). Each LIS can house up to 12 ASUs for a total of 36 ASU slots. The LIS resides either in the link peripheral processor (LPP) cabinet or optionally in the SuperNode combined core (SCC) SuperNode SE cabinet.

link interface unit (LIU)

The link interface unit is an application specific unit (ASU) used for Common Channel Signaling 7 (CCS7) applications. The LIU can be provisioned either

in the link peripheral processor (LPP) cabinet or optionally in the SuperNode combined core (SCC) SuperNode SE cabinet.

link peripheral processor (LPP)

The link peripheral processor is a new generation peripheral based on the SuperNode cabinet architecture. The LPP is supported on both the SuperNode and SuperNode SE systems. The LPP allows network providers to add special applications, such as Common Channel Signaling 7 (CCS7) and the DMS packet handler.

LIS

See link interface shelf.

LIU

See link interface unit.

LIU7

See line interface unit 7.

LMI

See local management interface.

local access and transport area (LATA)

A geographic area within which an operating company may offer telecommunications-related services.

local management interface (LMI)

A protocol that provides high-level communication between destination devices and the DataSPAN frame relay service.

LPP

See link peripheral processor.

LR

logic return

LTC

See line trunk controller.

LTC-I

See line trunk controller-ISDN.

LTP

See line test position.

LTPLTA

See line test position local test access.

LTPDATA

See line test position data.

LTPMAN

See line test position manual.

MADN

See multiple appearance directory number.

Magellan access integrator (MAI)

A series of wide area network (WAN) access products that integrate branch-office voice, fax, data, and LAN traffic. MAI connects to a Magellan backbone using a private leased line or public frame relay.

magnetic tape drive (MTD)

A magnetic tape drive is a device used to record data. An MTD can reside in the Meridian cabinet memory module (MCMM), the Meridian cabinet general module (MCGM), the Meridian cabinet auxiliary module phase 3 (MCAM3), or the cabinetized integrated services module (CISM). The MCGM is manufacture discontinued and is replaced by the MCAM3 or the CISM.

MAI

See Magellan access integrator.

main distribution frame (MDF)

The main distribution frame contains terminal blocks where cables from outside plant and office equipment are terminated.

maintenance trunk module (MTM)

In a trunk module equipment (TME) frame, a peripheral module (PM) that is equipped with test and service circuit cards and contains special buses to accommodate test cards for maintenance. The MTM provides an interface between the MSL-100 and the test and service circuits.

MAPCI

See MAP command interpreter.

MAP command interpreter (MAPCI)

The MAPCI is a MAP workstation level for accessing maintenance and other functional levels.

MBP

See modular business package.

MBS

See Meridian business set (MBS).

MByte

megabyte. A unit of measurement for data storage equal to 1,048,576 bytes.

MC7M

See Meridian cabinet CCS7 module.

MCA

See Meridian communications adapter.

MCAM3

See Meridian cabinet auxiliary module phase 3.

MCCM

See Meridian cabinet core module.

MCDM

See Meridian cabinet digital module.

MCDR

See Meridian cabinet digital remote.

MCGM

See Meridian cabinet general module.

MCLM

See Meridian cabinet line module.

MCLM-E

See Meridian cabinet line module-ISDN.

MCMM

See Meridian cabinet memory module.

MCNI

See Meridian cabinet network interface.

MCNM

See Meridian cabinet network module.

MCPM

See Meridian cabinet power module.

MCRM

See Meridian cabinet remote module.

MCRM-S

See Meridian cabinet remote module-SONET.

MCRU

See Meridian cabinet remote unit.

MCSM

See Meridian cabinet service module.

MCSS

See Meridian cabinet spares storage.

MCTM-I

See Meridian cabinet trunk module-ISDN.

MCU

See Multipoint conferencing unit.

MDC

See Meridian digital centrex.

MDF

See main distribution frame.

Meridian business set (MBS)

A telephone set that provides subscribers with push-button access to various business features. This set, used by the supervisor, has one more field display than the electronic business set (EBS).

Meridian cabinet auxiliary module phase 3 (MCAM3)

The MCAM3 cabinet provides power to the system lineup. This cabinet also houses service trunk modules (STM) and maintenance trunk modules (MTM).

Meridian cabinet CCS7 module (MC7M)

The MC7M cabinet is no longer manufactured or supported. It is replaced by the link peripheral processor (LPP) or the fiber link interface shelf (FLIS).

Meridian cabinet core module (MCCM)

The MCCM cabinet is a double-wide cabinet containing the duplicated system that is the NT40 central control complex (CCC) for the switch.

Meridian cabinet digital module (MCDM)

The MCDM cabinet contains four digital line modules (DLM) that service a total of 640 M2000 and M3000 Meridian digital sets, data terminals, or both. It is manufacture discontinued and is replaced by the intelligent peripheral equipment column (IPEC).

Meridian cabinet digital remote (MCDR)

The MCDR cabinet is a remotely located digital line module (DLM) connected to a host line trunk controller. The MCDR serves the complete line of Meridian digital telephones (M2000 and M3000 series), supporting both voice and data options. The MCDR is no longer manufactured or supported.

Meridian cabinet general module (MCGM)

The MCGM cabinet allows the customer to choose custom features and hardware and locate all customized features into one cabinet. This controls the amount of special engineering required for the system and keeps other cabinets standardized. The MCGM cabinet packages the disk drive unit (DDU), dual input/output controller (DIOC), and magnetic tape drive (MTD) for the SuperNode and SuperNode SE systems. The MCGM is manufacture discontinued and is replaced by the MCAM3 or the CISM.

Meridian cabinet line module (MCLM)

The MCLM cabinet houses two duplicated enhanced line modules (ELM). Each ELM has eight line drawers, which house 512 line cards. The MCLM cabinet provides 1024 single line card slots.

Meridian Cabinet Line Module-ISDN (MCLM-E)

The MCLM-E cabinet houses two duplicated ISDN line concentrating module-enhanced (LCM-E). The LCM-Es provide ISDN basic rate interface (BRI) and standard line capability. The LCM-Es provide 480 ISDN U-lines or 240 ISDN T-lines.

Meridian cabinet memory module (MCMM)

The MCMM cabinet provides memory expansion for the NT40 Core and houses a magnetic tape drive (MTD) and data store (DS).

Meridian cabinet network interface (MCNI)

The MCNI cabinet, combines ENET and LIS shelves into one cabinet. The MCNI addresses user requirements for providing networking capabilities in a singular, inexpensive package.

Meridian cabinet network module (MCNM)

The MCNM cabinet, provisioned with NT40 systems, contains two fully duplicated dual shelf network (DSN) modules.

Meridian cabinet power module (MCPM)

The MCPM cabinet provides power to the first lineup of the system through the power distribution panel (PDP). This cabinet also houses two disk drive units (DDU) and two maintenance trunk modules (MTM). The MCPM is manufacture discontinued and is replaced by the MCAM3.

Meridian cabinet remote module (MCRM)

The MCRM cabinet can interface up to 3000 remote subscriber lines to a Meridian SuperNode host, depending on traffic. The MCRM cabinet also provides an intra-calling capability, allowing calls between subscribers served by the same MCRM to be switched within that MCRM. The MCRM is manufacture discontinued and is replaced by the Meridian cabinet remote unit (MCRU) or the Meridian cabinet remote module-ISDN (MCRM-S).

Meridian cabinet remote module-SONET (MCRM-S)

The MCRM-S cabinet replaces the replaces the ISDN version of the Meridian cabinet remote module (MCRM-I) and performs all of the existing functions of the MCRM-I with a new platform that provides an interface for future fiber optics.

Meridian cabinet remote unit (MCRU)

The MCRU cabinet can interface up to 640 remote subscribers to a Meridian SuperNode host. The MCRU provides an intra-calling capability, allowing calls between subscribers served by the same MCRU to be switched within that MCRU. In the event of a complete outage of all DS-1 links between the remote and the host, the emergency standalone (ESA) feature provides the capability to maintain basic service for remote subscribers.

Meridian cabinet service module (MCSM)

The MCSM cabinet contains eight service trunk modules (STM) having digital service circuits, such as digital recorded announcement machines (DRAM)

and conference bridges. The MCSM is manufacture discontinued and is replaced by the MCAM3 or the CISM.

Meridian cabinet spares storage (MCSS)

The MCSS cabinet contains eight standard shelves where spare circuit packs can be stored. Four shelves can be mounted in the front of the cabinet, and four shelves can be mounted in the rear of the cabinet. The MCSS is manufacture discontinued and is replaced by the cabinetized miscellaneous spares storage (CMSS).

Meridian cabinet trunk module-ISDN (MCTM-I)

The MCTM-I cabinet contains up to two duplicated common peripheral controllers (CPC) that can be configured as a line trunk controller-ISDN (LTC-I), line group controller-ISDN (LGC-I), or digital trunk controller-ISDN (DTC-I).

Meridian communications adapter (MCA)

A part of data communications equipment. A single printed circuit pack (PCP) mounted within the telephone and works in conjunction with the digital interface chip also residing in the telephone. The firmware in the MCA serves as an interface between the user and the Meridian SL-100 system for establishing data calls. It allows asynchronous (110 to 19,200) ASCII terminals, personal computers, and printers to be connected to the telephone set through RS-232-C interface.

Meridian digital centrex (MDC)

A special DMS business services package that uses the data-handling capabilities of DMS-100 family offices to provide a centralized telephone exchange service. Formerly known as integrated business network (IBN).

Meridian feature transparency (MFT)

A line option that delivers the complete set of all Meridian digital Centrex (MDC) features. MFT allows a customer to convert to ISDN while retaining familiar MDC features on selected lines.

Meridian integrated conference bridge (MICB)

The MICB is an intelligent peripheral equipment (IPE) card that supports up to 32 ports. The system software must contain the automatic call distribution (ACD) features and routing software modules to support the MICB operation. Each MICB port is configured as an ACD M2616 digital telephone set. The Meridian SL-100 (MSL-100) system ACD function routes the incoming calls to the MICB, where each MICB port is treated as an ACD agent. All MICB ports belong to the same ACD queue and are treated as a pool of ports with equal status.

Meridian mail user interface (MMUI)

MMUI is Nortel Networks fully featured proprietary voice mail interface for DTMF sets available on Meridian and other-vendor switches. The MMUI interface is a command-driven voice mail interface primarily designed for business users.

Meridian power distribution center (MPDC)

When enhanced capabilities; such as the SuperNode, SuperNode SE, line peripheral processor (LPP), or intelligent peripheral equipment column (IPEC) products; are added to a new or existing Meridian SuperNode system, an external common power source (the MPDC cabinet) is required. The MPDC cabinet accepts -48 Vdc from the power board and distributes this power to the cabinet assigned. The MPDC is manufacture discontinued and is replaced by the cabinetized power distribution center (CPDC).

Meridian programmable data adapter (MPDA)

A single printed circuit pack that is mounted in the Meridian Aries digital telephone set.

message services module (MSM)

The MSM is a Nortel Networks-manufactured, central office-compliant, multi-applications voice processing system. The MSM is a highly reliable solution for medium-sized voice processing applications.

message switch (MS)

The message switch, housed in both the SuperNode and SuperNode SE systems, performs the system message functions and acts as the messaging hub for the system. The message switch contains the following elements: 128-Mbit/sec message bus system, message switch control complex, provisionable message port interfaces, and a central system clock.

message switch buffer (MSB)

The message switch buffer is a peripheral module used along with a signaling terminal (ST) to act as an interface to and operate within a Common Channel Signaling (CCS) environment. The MSB supports the ST and routes the messages received by the ST through the network module. The MSB also receives messages from the central control (CC) and routes them to the signaling link through the ST.

message transfer part (MTP)

A CCITT No. 7 Signaling protocol that provides a connectionless transport system for carrying common channel interoffice signaling no. 6 (CCIS6) and common channel signaling (CCS7) signaling messages between user locations or applications functions. Also known as message transport part.

message waiting indication (MWI)

A change of state of an indicator (such as stuttered dial tone, a steadily lit or flashing message-waiting lamp) that informs the user that a message has been queued against the station.

metallic test access (MTA)

Metallic test access is a hardware device that provides metallic connections between test access points (for example, in subscriber line circuit) and various types of test equipment.

MF

See multifrequency.

MFT

See Meridian feature transparency.

MICB

See Meridian integrated conference bridge.

MLC

See analog message waiting line card.

MMI

See user interface.

MMUI

See Meridian mail user interface.

modular business package (MBP)

An AccessNode packaging option installed as customer premise equipment (CPE).

Modular Option (GP)

Modular Option general purpose. The Modular Option (GP) system is a Nortel-manufactured, central office-compliant, multi-applications voice processing system. The MSM is a highly reliable solution for small to medium-sized voice processing applications.

MPC

See multiprotocol controller.

MPDA

See Meridian programmable data adapter.

MPDC

See Meridian power distribution center.

MPS

See multiple priority system.

MRS/AP

See multimedia resource server.

MS

See message switch.

MSB

See message switch buffer.

MSL

Meridian Stored Logic. Used with MSL-100, a large PBX.

MSM

See message services module.

MTA

See metallic test access.

MTD

See magnetic tape drive.

MTP

See message transfer part.

MTM

See maintenance trunk module.

MTU

See multiline test unit.

Mu-Law

The PCM coding and companding standard used in Japan and North America.
See A-Law.

multifrequency (MF)

A signaling method that makes use of pairs of standard tones to transmit signaling codes, digit pulsing, and coin-control signals. This method is used by interregister signaling on analog trunks.

multiline test unit (MTU)

The multiline test unit performs tests and measurements on subscriber lines. The MTU is connected to lines under test by the metallic test access (MTA) card.

multimedia resource server (MRS/AP)

The multimedia resource server and application processor provide the information processing and the interface to the telephony network for the OPEN IVR. MRS offers full voice processing capabilities plus advanced technologies such as speech recognition, ADSI and text-to-speech. MRS/AP uses state of the art DSP-based technology and industry standard circuit boards.

multiple appearance directory number (MADN)

A director number (DN) that appears on more than one Meridian digital centrex (MDC) station. The stations that are assigned these numbers are referred to as a MADN group. MADN groups can be configured with either single or multiple call arrangement.

multiple priority system (MPS)

A Magellan Passport system allowing the capability to manage different traffic types and allocate network resources based on application needs and business priorities.

multipoint conferencing unit (MCU)

A multipoint multimedia conferencing server. These servers can support many communication interfaces (such as ISDN BRI) and various numbers of ports. An MCU handles the multiplexing of video and audio signals among various machines.

multiprotocol controller (MPC)

A general purpose card that allows data communications between a DMS-100 switch and an external computer. The MPC card resides on the I/O controller (IOC) shelf. MPC card protocol software is downloaded from the DMS-100 CPU and then used to support software routines for data packet network (DPN) communications.

multi-vendor interface (MVI)

The interface that provides connection capabilities between the Meridian SuperNode system and switching equipment produced by other vendors, remote digital terminals (RDT), and the S/DMS AccessNode.

MVI

See multi-vendor interface.

MWI

See message waiting indication.

NAC

See network access code.

NAV

See network applications vehicle.

NEBS

new equipment building specifications

NET

See Network.

network (NET)

The Network subsystem monitors the network module (NM) and the speech links to the peripheral modules.

Network Access Code (NAC)

Canadian call management services.

network applications vehicle (NAV)

Platforms for creating and deploying interactive screen-based telephone services, flexible voice recognition, advanced call management and control, voice-activated dialing, and others.

network interface unit (NIU)

The network interface unit is a type of application specific unit (ASU) that uses DS30 links to route messages between the ASUs in the link peripheral processor (LPP) and the enhanced network (ENET).

network management (NWM)

Network Management provides controls that can be applied through the MAP workstation to maintain optimum transmission capacity and to offset the effects of traffic variations or component failures.

network message controller (NMC)

Each network module (NM) contains a network message controller that exchanges messages with the central control complex (CCC) and the peripheral module through the central message controller (CMC) in NT40 systems. In SuperNode systems, the NMC exchanges messages with the computing module (CM) and the peripheral module through the message switch (MS) bus.

network message service (NMS)

An optional network interface for Meridian mail host offices. NMS encourages centralized voice processing service provisioning by allowing message service to be provided to an entire city or local access and transport area (LATA) from a centralized Meridian mail messaging node. NMS provides the means for incoming CCS7 signaling trunks to be terminated on the SMDI link handler (thereby enabling the pass-through of called and calling directory number (DN) information). Each Meridian mail messaging node serving subscriber mailbox lines also requires NMS to deliver message waiting using CCS7.

network module (NM)

Network modules are a main functional area of the Meridian SuperNode system. The NM components of the network are duplicated as two parallel sets (Plane 0 and Plane 1) of the two-way transmission paths for each connected channel between the peripheral modules (PM).

network termination 1 (NT1)

An access point for basic rate interface (BRI) to ISDN. This component is situated on customer premises and is typically located between the terminals and the exchange termination. An NT1 is required when ISDN lines are terminated by U-line cards.

nibble

A byte has eight bits. A nibble is four bits, or one half of one byte.

NIU

See network interface unit.

NM

See network module.

NMC

See network message controller.

NMS

See network message service.

Nortel Networks technical publication (NTP)

An NTP is a document that contains descriptive information about Nortel Networks hardware or software modules and performance-oriented practices for installing, testing, and maintaining the system. NTPs are often supplied as part of the standard documentation package provided to a customer.

NT1

See network termination 1.

NTP

See Nortel Networks technical publication.

NWM

See network management.

OM

See operational measurement.

OPC

See originating point code.

OPM

See Outside plant module.

OTM for MSL-100

See Optivity Telephony Manager for MSL-100.

originating point code (OPC)

A Common Channel Signaling 7 (CCS7) term defining the address of a signaling point that generated the message.

OPEN IVR

OPEN IVR is one of the two IVR products that can be used with both DMS and non-DMS switches. Open IVR is a stand-alone product that provides a number of network interfaces and independent voice ports that allow for connection to a wide variety of switches.

operational measurement (OM)

System performance is constantly and automatically recorded by the Operational Measurement system. The measurements are stored in OM registers, either individually every time an event occurs (a peg count) or on the basis of a scan that is conducted at regular intervals, regardless of the time of occurrence of the event (a usage measurement).

optivity telephony manager for Meridian SL-100

Optivity Telephony Manager for Meridian SL-100 is a graphical user interface (GUI)-based management platform for the Meridian SL-100 product .

OSP

See outside plant (OSP) cabinet.

outside plant (OSP) cabinet

An AccessNode packaging option installed as an RFT.

outside plant module (OMP)

A stand-alone weatherproofed enclosure equipped to connect from two to six DS-1 links from a line group controller (LGC) at a host office and up to 640 locally connected subscriber lines. n OPM consists of one line concentrating module (LCM), a remote maintenance module (RMM), a host interface equipment (HIE) shelf, a power supply, environmental control equipment, and a cable cross-connection for up to 1280 pairs.

PCI

personal communication interface

PCL

product CM loads.

PCM

See pulse code modulation.

PDP

See power distribution panel.

PEPS

See peripheral equipment power supply.

peripheral equipment power supply (PEPS)

A PEPS card resides on each intelligent peripheral equipment (IPE) shelf. The PEPS provides power to the IPE shelf and regulates all the voltages required by the cards on its shelf.

peripheral module (PM)

A peripheral module refers to all hardware or modules of the system that provide interfaces between the network module and external line, trunk, or service facilities. A PM contains peripheral processors, which perform local routines, thus relieving the load on the central processing unit (CPU).

peripheral processor (PP)

Each peripheral module (PM) has a peripheral processor function that performs local processing action within its PM and controls the flow of messages between itself and the central control complex (CCC) for NT40 systems or the computing module (CM) for SuperNode and SuperNode SE systems. This independent action by the PP relieves the CCC or CM of routine local processing.

permanent virtual circuit (PVC)

A continuously available virtual path between remote applications and DMS applications. The PVC eliminates the need to establish a circuit on an each call basis.

personal information manager (PIM)

A format directory in which multiple phone and data numbers, address, company, title, and a memo for details can all be stored for easy retrieval.

PHG

personal hazard ground

PIM

See personal information manager.

PM

See peripheral module.

power distribution panel (PDP)

The power distribution panel supplies power to a maximum of 11 cabinets in the lineup, including the cabinet in which the PDP resides. The PDP resides in both the Meridian cabinet power module (MCPM) and the Meridian cabinet auxiliary module phase 3 (MCAM3).

power supply module (PSM)

Each SuperNode dual plane combined core (DPCC) cabinet contains a power supply module at both ends of each shelf. Each PSM consists of one +5 V/80 A and one -5 V/20 A power converter circuit packs.

PP

See peripheral processor.

PPSN

See public packet switching network.

PRI

See primary rate interface.

primary rate interface (PRI)

An interface that carries nB+D channels over a digital DS-1 facility (23B+D in North America and 30B+D in Europe). PRI is used to link private networking facilities, such as private branch exchanges (PBX), local area networks (LAN), and host computers with a standardized architecture acting as the bridge between private switching equipment and the public network. Formerly known as primary rate access. A PRI card provides the physical interface to the DS-1 for the MSL-100.

program store (PS)

The program store module contains the program instructions required by the central processing unit (CPU) for call processing and maintenance and administrative tasks.

PS

See program store.

PSM

See power supply module.

PTS

per trunk signaling. A conventional telephony method of signaling that multiplexes the control signal of a call with voice or data over the same trunk.

public packet switching network (PPSN)

A common carrier network designed to carry data in the form of packets between public users.

pulse code modulation (PCM)

Pulse code modulation is a form of modulation in which the modulating signal is sampled and the sample quantized and coded, so that each element of information consists of different kinds or numbers of pulses and spaces.

PVC

See permanent virtual circuit.

PVP

See permanent virtual circuit.

RCC

See remote cluster controller.

RCC2

See remote cluster controller 2.

RDLM

See remote digital line module.

RDT

See remote digital terminal.

read-only memory (ROM)

ROM is a solid state memory device that has information permanently written into the memory during manufacture.

Ready to Send (RTS)

A configurable MCA data call option. When the RTS is on, the MCA force the RTS lead active and assumes the local DTE is always ready to transmit or receive data. There is no flow control. Turning RTS allows RTS/CTS hardware flow control handshaking.

remote cluster controller (RCC)

A dual-shelf peripheral module that provides a master controller for all units at the remote switching center (RSC) and is, in turn, controlled by the host line trunk controller (LTC).

remote cluster controller 2 (RCC2)

A remote cluster controller (RCC) for the remote switching center-SONET (RSC-S). The RCC2 is an enhanced RCC that provides the central control of the RSC-S. It is connected to the host by metallic or fiber connections. The

RCC2 is a single-shelf peripheral module (PM) that provides the same functions for all units at the RSC.

remote digital line module (RDLM)

A peripheral module developed to allow the MSL-100 system to interface with the M2000 series of digital telephones.

remote digital terminal (RDT)

A multi-vendor interface access remote or S/DMS AccessNode remote.

remote fiber terminal (RFT)

A FiberWorld network element that is the Nortel Networks version of a remote digital terminal. The RFT terminates subscriber lines and multiplexes them onto a synchronous optical network SONET facility.

remote maintenance module (RMM)

A peripheral module (PM) with a configuration similar to the maintenance trunk module. An RMM accommodates up to 12 service and test cards.

remote office test line (ROTL)

The remote office test line is part of the centralized automatic trunk testing system. The ROTL schedules and performs transmission and signaling tests on trunk circuits between offices.

remote switching center (RSC)

A remote common peripheral module (CPM) that provides an interface with a large number of analog lines, digital trunking, or both at a remote location. The RSC also handles remote-off-remote connections from other remote sites.

remote switching center-SONET (RSC-S)

An enhanced version of the RSC. The RSC-S is a remote common peripheral module (CPM) peripheral that provides all the functions and features of the existing RSC, but with increased capacity and the option of fiber optic connectivity.

RFT

See remote fiber terminal.

RMM

See remote maintenance module.

ROM

See read-only memory.

ROTL

See remote office test line.

RSC

See remote switching center.

RSC-S

See remote switching center-SONET.

RTS

See Ready to Send.

SCA

See single call arrangement.

SCAI

See switch-to-computer application interface.

SCC

See SuperNode combined core.

SCCP

See signaling connection control part.

SCP

See service control point.

SCU

See system control signal unit.

SDL

See signaling data link.

selective call forwarding (SCF)

An incoming call management feature that allows subscribers to define a special list of telephone numbers and remote destination numbers. Calls that terminate on a station with SCF are forwarded only if the originating station directory number matches one of the defined numbers.

service control point (SCP)

A node in a common channel signaling 7 (CCS7) signaling network that supports application databases. The function of an SCP is to accept a query

for information, retrieve the requested information from one of its application databases, and send a response message to the originator of the request.

service switching point (SSP)

A DMS-100F/DMS SuperNode switching system equipped with signaling capabilities can originate or terminate CCS7 messages and queries to network service control points (SCP).

service trunk module (STM)

The service trunk module, provisioned in both the Meridian cabinet service module (MCSM) and Meridian cabinet auxiliary module phase 3 (MCAM3) cabinets, provides conference bridges and other digital service circuits, such as the enhanced digital recorded announcement machine (EDRAM). (EDRAM can be provisioned only in STM in the MCAM3 cabinet.)

Siemens KNS-4100 System

A PBX manufactured by Siemens that is used primarily in Europe.

signal processing node (SPN)

A node on the MSM that is used for signal processing. SPNs handle all voice processing and is associated with a storage module to hold user data. SPNs are paired for reliability through redundancy.

Signaling Connection Control Part (SCCP)

A level of Common Channel Signaling 7 (CCS7) layered protocol. It supports advanced services such as E800 and service switching point (SSP) and the automatic calling card service (ACCS) feature. The main functions of the SCCP include the transfer of signaling units with or without the use of a logical signaling connection and the provisioning of flexible global title translations (GTT) for different applications.

signaling data link (SDL)

A bidirectional transmission path for signaling. An SDL consists of two data channels operating together in opposite directions at the same data rate. It constitutes the lowest functional level (level 1) of CCITT no. 6 signaling (N6), common channel interoffice signaling no. 6 (CCIS6), and common channel signaling 7 (CCS7) hierarchies.

signaling point (SP)

A node in a Common Channel Signaling (CCS7) network that originates, terminates, or transfers signaling messages from one signaling link (SL) to another.

signaling terminal (ST)

The signaling terminal is the hardware that performs error checking, coding, and decoding of signaling messages.

signaling transfer point (STP)

A node in a CCS7 network that routes messages between nodes. STPs transfer messages between incoming and outgoing signaling links but, with the exception of network management information, do not originate or terminate messages. STPs are deployed in pairs. If one STP fails, the mate takes over, ensuring that service continues without interruption.

Simple network management protocol (SNMP)

Although SNMP was designed as the transmission control protocol's (TCP) stack network management protocol, it can now manage virtually any network type and has been extended to include non-TCP devices such as 802.1 Ethernet bridges. SNMP is widely deployed in TCP/IP (transmission control protocol/internet protocol) networks, but actual transport independence means it is not limited to TCP/IP. In 1991, Microsoft started referring to SNMP as SubNetwork Access Protocol. In November of 1993 Cisco Systems announced that its internetwork routers will support version 2 of SNMP. Nortel Networks uses SNMP in its MAT GUI product (feature AX0377).

Simplified message desk interface (SMDI)

The simplified message desk interface (SMDI) is a standardized protocol used to connect a voice mail system to a switch. The MSM base configuration includes a single SMDI link through a single internal modem or a redundant internal modem pair.

single call arrangement (SCA)

An option that allows only one station to be active, either originating or terminating calls, on a multiple appearance directory number (MADN).

single point ground (SPG)

The point at which the isolated bonding network is connected to the common bonding network. The SPG is usually the copper bar serving as the grounding electrode or its extension.

single shelf link peripheral processor (SSLPP)

An alternative to a full link peripheral processor (LPP) where the number of link interface unit (LIU7) application specific units (ASU) desired does not make the full LPP a cost effective option or offices lacking floor space near the core processor makes it impossible to install an LPP cabinet.

SLM

See system load module.

SMA

See subscriber carrier module-100 access

SMA2

See subscriber carrier module-100 access, second version

small remote unit (SRU)

A small integrated services digital network ISDN line concentrating module whose hardware and software are based on the DMS-100 switch series-II peripherals.

SMDI

See simplified message desk interface.

SMDR

See station message detail recording.

SMU

See subscriber carrier module-100 urban.

SNA

System network architecture.

SNMP

See simple network management protocol.

SNSE

See SuperNode space enhanced.

SPN

See signal processing node.

SONET

See synchronous optical network.

special tone receiver (STR)

The special tone receiver is a digital signal tone processing tone receiver for applications that are characterized by per call, long holding time (30+ second) receiver requirements. Examples of this type of receiver are Reorigination and Blue Box Fraud detection.

Spectrum peripheral module (SPM)

The SPM is a trunking peripheral with OC-3 optical interface and improved signal processing capacity. It is a multi-application high-speed Meridian SuperNode peripheral platform with a flexible modular and highly reliable architecture.

SP

See signaling point.

SPC

See stored program controller.

SPG

single point ground

SPM

See Spectrum peripheral module.

SRU

See small remote unit.

SSLP

See single shelf link peripheral processor.

SSP

See service switching point.

ST

See signaling terminal.

station message detail recording (SMDR)

Station message detail recording records details of billable and non-billable calls for each business group.

STM

See service trunk module.

stored program control (SPC)

Control of an automatic switching arrangement in which the call processing is determined by a program stored in an alterable memory.

STP

See signal transfer point.

STR

See special tone receiver.

subscriber carrier module-100 access (SMA)

The LTC based DMS peripheral that provides common signaling channel/embedded operations channel (CSC/EOC) link management, DS-1 facility management, and the interface to the DMS-core component.

subscriber carrier module-100 access, second version (SMA2)

The digital interface between a Meridian SuperNode and a multi-vendor interface remote digital terminal or an S/DMS AccessNode.

subscriber carrier module-100 Urban (SMU)

A subscriber carrier module that provides an interface between the remote carrier urban (RCU) of a DMS-1 switch and the central office (CO) of a DMS-100 Family switch.

SuperNode combined core (SCC)

The SCC cabinet provides the SuperNode SE core. This cabinet differs from a standard SuperNode cabinet in that the SCC combines the two message switch (MS) shelves into one shelf and combines the computing module (CM) and system load module (SLM) shelves into a single shelf.

SuperNode space enhanced (SNSE)

The SuperNode space enhanced (SuperNode SE) is a scaled-down version of the standard SuperNode core and is designed to serve smaller offices with a maximum of 20,000 lines. The SNSE system is also referred to as Meridian 1 Option 201.

SVC

See switched virtual circuit.

switch-to-computer application interface (SCAI)

Switch-to-computer application interface (SCAI) is a protocol standard set by the ANSI T1S1 committee. Meridian SCAI (also referred to as CompuCALL) is Nortel's implementation of this emerging standard. Meridian SCAI provides a SCAI signaling channel between the Meridian SuperNode and a customer site host computer. This signaling channel exchanges information between the customer's host computer and the Meridian SuperNode to enhance call processing.

switched virtual circuit (SVC)

A logical end-to-end connection for data communications made through a data packet network (DPN). An SVC is established dynamically.

Switch Manager

See Optivity Telephony Manager (OTM) for MSL-100.

Synchronous Optical Network (SONET)

SONET is a standard for optical transport that defines optical carrier levels and their electrically equivalent synchronous transport signals.

system control signal unit (SCU)

A control signal in CCITT No. 6 signaling that is used to transmit changeover, load transfer, and standby-ready signals.

system load module (SLM)

The system load module is the mass storage system used for storing office images and for booting new loads or stored images into the computing module (CM). The SLM resides in both the dual plane combined core (DPCC) and the SuperNode combined core (SCC) cabinets.

T1

A digital transmission link with the capacity of 1.544 MBps (1,544,000 bits per second). T1 handles 24 voice conversations, each one digitized at 64 Kpbs. T1 is the standard for digital transmission in the United States, Canada, Hong Kong, and Japan. In Europe, T1 is called E1.

TAPI

See telephony application programming interface.

TBB

transmission bonding bar.

TBR

Talk Battery Return.

TCAP

See Transaction Capabilities Application Part.

TCM

time compression multiplexing.

TDM

time division multiplexing.

TDMA

time division multiplexing accessing.

Technical Assistance Service (TAS)

Technical Assistance Service, offered by Nortel Networks on a dial-up basis, provides assistance to system maintenance personnel if a problem arises that cannot be corrected by normal procedures.

telephony application programming interface (TAPI)

An industry standard (led by Microsoft) for CTI-based applications serving as a critical building block for wide-scale development and implementation of CTI applications at the desktop. A programming interface for direct links between desktop computers and key telephone systems or PBX.

text messaging system (TMS)

A text messaging system uses a visual display unit with a keyboard to provide a message desk agent with an incoming call information display, a text entry facility to record messages, and a text retrieval facility to display all the messages for a user.

TMS

See text messaging system.

transmission test trunk (TTT)

The transmission test trunk is a facility used by the trunk test position to provide circuitry for performing loss and noise measurements.

Transaction Capabilities Application Part (TCAP)

A service that provides a common protocol for remote operations across the Common Channel Signaling 7 (CCS7) network. The protocol consists of message formatting, content rules, and exchange procedures. TCAP provides the ability for the service switching point (SSP) to communicate with a service control point (SCP). TCAP is used by the ISDN layer facility message to transport service information for transaction signaling, not associated with an active call, over primary rate interface (PRI) links.

transmission test unit (TTU)

The Transmission test unit is a digital signal processor used to perform transmission measurements on lines and trunks.

trunk test position (TTP)

The trunk test position handles four levels of testing:

- diagnostic test, performed by the diagnostic test process
- monitor level test, which allows all trunks to be monitored in both talk path directions

- test line tests, performed by the test line process
- manual test connections, performed by the TTP process

TS

time switch

TTP

See trunk test position.

TTT

See transmission test trunk.

TTU

See transmission test unit.

tuple

A field within a data schema table. Tuples are accessed and updated using an editor on a MAP workstation.

user administration terminal (UAT)

A secondary MSM administration terminal that is used to perform user administrative functions but not system administrative functions.

UBC

uniform building codes

UEM

See universal equipment module.

UNI

user network interface.

universal equipment module (UEM)

The universal equipment module provides the framework for housing the intelligent peripheral equipment (IPE) module.

universal tone receiver (UTR)

The universal tone receiver is an optional peripheral module (PM) card. The UTR is a 32-channel tone receiver. Thirty channels detect a variety of tones including dual-tone multifrequency (DTMF) for lines and multifrequency (MF) for trunks. The UTR identifies tones and sends the results to the signaling processor.

UTR

See universal tone receiver.

variable call detail recording (VCDR)

A billing platform that collects comprehensive NSS call details on a per IBN customer group basis and allows the NSS customer to select one or more formats for their billing records. Replaced in MSL-100 release MSL07 with SMDR.

VCDR

See variable call detail recording.

VDU

See visual display unit.

VISIT interface unit (VIU)

The standalone hardware interface between the telephone and the computer.

visual display unit (VDU)

A VDU is an electronic output device that presents data to a terminal user in the form of a television picture. In the Meridian SuperNode system, the VDU is one of the components of the MAP workstation and, along with a keyboard, provides the main user interface to the switch.

VIU

See VISIT interface unit.

VMS

See voice messaging system.

VMUIF

See voice messaging user interface forum.

Voice messaging user interface forum (VMUIF)

A self-contained, menu-driven call answering and voice messaging interface. It is the Industry Information Association's (IIA) recommended user interface for public network call answering. VMUIF can be set up to receive and send composed messages, provide the user with simple call answering capabilities or full voice messaging functionality.

voice messaging system (VMS)

A voice messaging system is an automated recording device that automatically stores and plays back a caller's voice message. The message is transmitted exactly as it was delivered, without the intervention of a human agent.

X.25/X.75/X.75' link interface unit (XLIU)

The XLIU is a type of application specific unit (ASU) that is used for DMS packet handler applications.

XLIU

See X.25/X.75/X.75' link interface unit.

XPM

See XMS-based peripheral module (XPM).

XMS

See extended multiprocessor system (XMS)

XMS-based peripheral module (XPM)

The generic name for peripheral modules (PM) that use the Motorola 68000 microprocessor. An XPM has two processors in a hot-standby configuration: a master processor (MP) and a signaling processor (SP).

XNET

Also called IT1000. A technology designed to transport large data streams while simultaneously providing transport for analog voice and/or CLASS services over existing installed base wiring. Designed to provide higher speed data services using established twisted pair phone lines to customers. This service addresses the rapidly expanding home office and internet access markets.

XSM

See extended system monitor.

Meridian SuperNode

Commercial Systems

Feature Description Manual

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Information is subject to change without notice. Nortel Networks reserves the right to make changes in design or components as progress in engineering and manufacturing may warrant.

This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of the FCC Rules, and the radio interference regulations of the Canadian Department of Communications. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at the user's own expense. Allowing this equipment to be operated in such a manner as to not provide for proper answer supervision is a violation of Part 68 of the FCC Rules, Docket No. 89-114, 55FR46066.

The MSL-100 system is certified by the Canadian Standards Association (CSA) with the Nationally Recognized Testing Laboratory (NRTL).

This equipment is capable of providing users with access to interstate providers of operator services through the use of equal access codes. Modifications by aggregators to alter these capabilities is a violation of the Telephone Operator Consumer Service Improvement Act of 1990 and Part 68 of the FCC Rules.

This Class A digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouilleur du Canada.

YEAR 2000 READINESS DISCLOSURE

This information was originally published prior to October 19, 1998. The foregoing legend applies retroactively in accordance with the U.S. Year 2000 Information and Readiness Act and on an ongoing basis.

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