Meridian Mail Modular Option
Installation and Maintenance Guide

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Meridian Mail Modular Option
Installation and Maintenance Guide

Publication history

November 1999	The *Modular Option Installation and Maintenance Guide* is released as Standard 1.0.Release 13 of Meridian Mail is documented, and the Enhanced MMP40 card is introduced.
January 1998	The *Modular Option Installation and Maintenance Guide* is released as Standard 1.0. No technical changes were necessary for Release 12. This edition makes all previous editions obsolete.
November 1996	The *Modular Option Installation and Maintenance Guide* is released as Standard 1.0. This version documents Release 11 of Meridian Mail installation and maintenance procedures for the Meridian Mail Modular Option system. This edition makes all previous editions obsolete.
August 1995	The *Modular Option Installation and Maintenance Guide* is released as Standard 1.0. This version documents Release 10.0 of Meridian Mail installation and maintenance procedures for the Meridian Mail Modular Option system. This edition makes all previous editions obsolete.
April 1995	The *Modular Option Installation and Maintenance Guide* is released as Standard 1.0. This version documents Release 9.5 of Meridian Mail installation and maintenance procedures for the Meridian Mail Modular Option.

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Preface

About this guide

In this chapter

Overview

Introduction

This document describes installation and maintenance procedures to be followed by the technician or technical support engineer who installs and/or maintains Meridian Mail, or by the Meridian Mail system administrator. It is assumed that you have a functioning Meridian 1/SL-1 switch.

Installation section

This guide explains how to install and configure a Meridian Mail system and how to connect cables between the switch and Meridian Mail. This guide also shows you how to expand a Meridian Mail system.

Chapter 4, "Unpacking and inspecting the Meridian Mail equipment," explains how to program the switch to recognize newly added loops or ports, or both, and how to communicate command and status information to Meridian Mail.

Troubleshooting

Chapter 14, "Troubleshooting startup problems," provides tables to help you identify a problem and the procedures to correct it.

Hardware maintenance

Chapter 16, "Hardware maintenance," describes how to install those hardware parts that can be replaced in the field. The parts are

- printed circuit packs (PCPs)
- power converter assembly
- hard disk subsystem
- cartridge tape unit

The following parts are repaired in the factory, so they are not covered:

- Meridian Mail backplane assembly
- cable harnesses

Administration guide references

Introduction

For references to the system administration guide, refer to the following list to find the version of the NTP (as identified by the NTP number) that applies to the system you are working on:

- *System Administration Guide* (NTP 555-7001-301)
- *System Administration Guide for Multi-Customer Systems* (NTP 555-7001-302)

Chapter 1

Introduction to Meridian Mail Modular Option

In this chapter

Overview

Introduction   This chapter provides a brief overview of the hardware,
                          software, and capabilities of the Meridian Mail Modular Option
                          system. The chapter also describes the hardware and software
                          that must exist on the Meridian 1/SL-1 switch to be used with
                          Meridian Mail.

                          Note: Generally, from a Meridian Mail perspective, the
                          Meridian 1 and SL-1 switches are the same. For economy,
                          this guide only uses the term "Meridian 1" for both of these
                          switches.

Supported system   The system must have an Enhanced MMP40 card or the
configuration   previous MMP40 card in every node on the system (primary
                          node and voice nodes). The 68K CPU card is not supported.

Platform migration   If this is not a new installation (you are migrating from an
and release   existing Meridian Mail system), you must perform any
conversion   hardware installation or modification as part of the software
                          installation. The *System Installation and Modification Guide*
                          (NTP 555-7001-215) describes all the necessary steps for
                          software (system) installation, platform migration, and
                          hardware modification. When necessary, the *System Installation
                          and Modification Guide* refers back to this manual for hardware
                          installation information.

                          Before you begin the system installation and modification
                          procedures, unpack and inspect the new hardware as described
                          in Chapter 4 "Unpacking and inspecting the equipment." Then
                          refer to the *System Installation and Modification Guide* to begin
                          the platform migration and release conversion.

Converting from an existing Modular Option system

Introduction

If you are converting to Release 13 from an existing Modular Option 68K or MMP40 system, run Comprehensive upgrade.

Conversion to Release 13 requires replacement of the 68K CPU card with the Enhanced MMP40 card on all nodes. The Enhanced MMP40 card allows the system to be upgraded to run at 9600 bps. This upgrade is optional as the system will run at 2400 bps. The most important aspect of the decision to run at either speed is to ensure that you set the console/administrative terminal and modems to match the speed of the installed BootROM.

Tandberg tape drives are available (but not mandatory) for Release 13. They provide greatly enhanced speed and storage capacity. The Archive Viper tape drives are still supported, but if you decide to use the new Tandberg drive, refer to Chapter 6 "Inspecting and installing the power suplies and mass storage units," for replacement instructions.

Before you begin the system installation and modification procedures, unpack and inspect the new hardware as described in Chapter 4 "Unpacking and inspecting the Meridian Mail equipment." Then refer to the *System Installation and Modification Guide* to begin the conversion to Release 13.

Note: You cannot revert to an earlier version of the Modular Option system once you have converted the system to Release 13.

Node expansion on an existing system

To perform a node expansion (add nodes to an existing system), you need to use the system installation and modification program on the Install/data tape. The "Comprehensive Upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) discusses all the necessary steps for node expansion. When necessary, the *System Installation and Modification Guide* refers back to this manual for hardware installation information.

Before you begin the system installation and modification procedures, unpack and inspect the new hardware as described

in Chapter 4 "Unpacking and inspecting the equipment." When the *System Installation and Modification Guide* instructs you to install the new hardware, refer to Chapter 14 "Adding a node," for a complete list of the hardware installation tasks that you need for a node expansion.

Hardware

Introduction   The Meridian Mail Modular Option offers a multiple system
administration capability that allows up to three user
administration terminals to be added to the system.

Mailbox class of service reduces the time to a minimum to set
up or modify large groups of users.

Hardware   The Meridian Mail Modular Option platform is packaged in the
universal equipment module (UEM), which allows it to be
integrated within a Meridian 1 column or installed as a stand-
alone system.

Modular Option has several hardware features that simplify the
installation, expansion, and maintenance of the system. These
features include

- a choice of an AC- or a DC-powered system
- a high degree of hardware integration, which allows up to
  three voice processing nodes to share a single equipment
  module
- location of switches on the backplane instead of on the
  printed circuit packs (PCPs)
- location of intermodule cabling on the backplane
- disk shadowing to provide protection against loss of data if
  a disk fails
- hot-pluggable voice processor cards (that is, the ability to
  remove or insert voice processor cards while power is on)
- up to 1600 hours of message storage space using 4.0 Gbyte
  disk drives
- up to four available RS-232 ports in a one-module system,
  and up to 10 ports in a two- or three-module system
- up to 96 ports
- a tape drive for software installation and system backup

**Hardware
configurations**   You can configure the system with up to five nodes. (A node is a
functionally independent unit with its own CPU card.) The
module backplane interconnects each node to the other nodes in

the module. An external voice bus (EVB) cable connects nodes located in separate modules.

The Meridian Mail system can be shadowed or unshadowed, which results in the following possible configurations:

- 1-node unshadowed
- 1-node shadowed
- 2-node unshadowed
- 2-node shadowed
- 3-node unshadowed
- 3-node shadowed
- 4-node unshadowed
- 4-node shadowed
- 5-node unshadowed
- 5-node shadowed

Every node is equipped with

- one or two hard drives, if you choose the disk-shadowing option
- one CPU card (Enhanced MMP40 card with 16 Mbytes of DRAM)
- one or more voice processors (VP) with either four or eight ports (except for node 1 of a 3- to 5-node system)

In addition to the above components, each system is equipped with

- one tape drive (in node one)
- one or two utility cards (depending on system size)
- modems for remote administration and troubleshooting
- modems for networking (optional)

Enhanced MMP40 card

The Enhanced MMP40 card has the following capabilities:

- 16 Mbytes of DRAM
- 24 MHz 68040 processor
- up to 24 voice ports in a 1-node system
- up to 48 voice ports in a 2-node system
- up to 24 voice ports per voice node in a 3- to 5-node system

Switch requirements

Switch software requirements

The Meridian 1 software must be Generic X11 software Release 14 or later.

The following packages must be present in the X11 software:

- Recorded Announcement (RAN, package 7)
- Time and Data (TAD, package 8)
- Make Set Busy (MSB, package 17)
- Integrated Messaging System (IMS, package 35)
- Basic Automatic Call Distribution (BACD, package 40)
- ACD Package A (ACDA, package 45)
- Message Center (MWC, package 46)
- Command and Status Link (CSL, package 77)
- Auxiliary Processor Link (APL, package 109)

Switch hardware requirements

The minimum switch hardware requirements for Meridian Mail Modular Option are

- Meridian 1 Option 21, 21A, 51, 61, 71, or 81; or SL-1 ST, N, LE, XL, XN, RT/NT/XT, or MS
- enhanced serial data interface (ESDI) card (QPC513 version H or later), or an NT6D80 multipurpose serial data link (MSDL) card
- enhanced network card (QPC414C)
- limited distance modems (LDMs) if the Meridian Mail module is between 15.2 and 1219.2 m (50 and 4000 ft) from the Meridian 1, the administration terminal, a multiple administration terminal (MAT), or guest administration console (GAC)
- modems for communications if the Meridian Mail module is more than 1219.2 m (4000 ft) from the Meridian 1, the administration terminal, a MAT, or a GAC. You require a central office (CO) or direct inward dialing (DID) trunk for modem connection.

Chapter 2

Preparing for installation

In this chapter

Overview

Introduction   Ensure that the site meets the requirements listed in the *Site and Installation Planning Guide* (NTP 555-7041-200).

Tools required

Introduction

Have the following tools at hand before beginning the installation:

Tool	Description
Slotted screwdriver	small, 4.76 mm (3/16 inch)
Wire strippers	
Wire cutters	
BIX connector tool	NT product number GYB1X16
Carpenter's level	
Phillips screwdriver	small, medium
Socket wrenches	1/4, 5/16, and 9/16 inch
Hammer	
Flashlight	
9- to 25-pin adapter cable	NT4R60AA (for monitoring node expansion)
Electrostatic discharge (ESD) wrist strap	

Reference documents

Introduction   Documents referenced in this manual are listed the following
                          table.

**Referenced
documents and
NTP numbers**

Document name	NTP number
SL-1 Features and Services Practice	553-2301-105
SL-1 Maintenance Manual	553-2301-511
NT6D82 Power System: Description, Installation, and Maintenance	553-3001-110
SL-1 System Installation Planning	553-3001-120
SL-1 System Installation Procedures	553-3001-210
Circuit Card Installation and Testing	553-3001-211
X11 Input/Output Guide	553-3001-400
NTP Contents Overview	555-7001-000
System Installation and Modification Guide	555-7001-215
Meridian Mail System Administration Guide	555-7001-301
Meridian Mail System Administration Guide for Multi-Customer Systems	555-7001-302
System Administration Tools	555-7001-305
Meridian Mail Maintenance Messages (SEERs) Guide	555-7001-510
Meridian Mail Modular Option Site and Installation Planning Guide	555-7041-200
Networking Installation and Administration Guide	555-7001-24x

Chapter 3

Assembly overview

In this chapter

Overview

Introduction   This section summarizes the tasks and procedures required to
                          install a Meridian Mail system or expand an existing system by
                          adding a node (refer to the following table).

                          Because Meridian Mail is housed in a universal equipment
                          module (UEM), you will need the appropriate Meridian 1
                          documentation to install this part of the system. The manuals
                          you need to install the UEM are listed in Chapter 5, "Installing a
                          column or module."

Before you begin   Before starting the installation, make sure the site meets the
                          requirements listed in the *Modular Option Site and Installation
                          Planning Guide* (NTP 555-7041-200).

                          Hardware must be installed in the proper order. The chapters in
                          this document are arranged in the order in which they are
                          needed. When you have finished the installation steps in one
                          chapter, continue with the next.

                          Whenever possible, install external power equipment before
                          installing a Meridian Mail column.

                          Note: System installation must be performed only by qualified
                          personnel.

	DANGER
	Risk of electrocution
	Nortel Networks requires that a licensed electrician make all connections needed at an electrical service panel.

Installation tasks

Install task list   The following table shows the installation task list.

Procedure	Reference
Unpack and inspect equipment.	Chapter 4
If necessary, install Meridian Mail columns, including power and grounding, and earthquake protection. Install Meridian Mail modules.	Chapter 5
Install the power supplies and disks.	Chapter 6
Prepare for system migration if necessary.	Chapter 7
Install the printed circuit packs and associated cables.	Chapter 8
Perform diagnostics and software expansion for node expansion.	Chapter 9
Install the Meridian Mail to PBX interface.	Chapter 10
Install and configure peripheral devices.	Chapter 11
Configure the Meridian 1.	Chapter 12
Start up, configure, and acceptance test Meridian Mail.	Chapter 13

Chapter 4

Unpacking and inspecting the Meridian Mail equipment

In this chapter

Overview

Introduction   This chapter provides the procedures for unpacking and
                          inspecting Meridian Mail equipment.

Unpacking and inspecting the equipment

Introduction

The following procedure describes how to unpack and inspect the Meridian Mail equipment to make sure all the components are present.

<table>
<tr><td>⚠</td><td>**CAUTION**
Risk of equipment damage

Wear an antistatic wrist strap when handling components. Handle components by the edges and, whenever possible, with the loosened packing material still around them.</td></tr>
</table>

Unpacking and inspecting Meridian Mail equipment

When unpacking and inspecting Meridian Mail equipment, follow these steps.

Step	Action
1	If equipment is mounted on a shipping pallet, follow the unpacking instructions provided with the packaging material, and remove equipment from the pallet.
2	Cut any remaining strapping and tape.
3	Remove transport protection devices and loosen any stretch-wrap film (if provided) from the equipment. The stretch-wrap film can be removed, but it is advisable to keep the film wrapped loosely around the equipment during handling. Retain the packaging material in case any equipment needs to be returned.
4	Remove all hardware components that were shipped in separate boxes, and check for damage such as loose parts, broken edges, and any other obvious damage. Components that are usually shipped in separate boxes include documentation, disk and tape units, power supply, cables, administration terminals, printer, and spares.

Step	Action

5   Check all items delivered against the order form and the packing slip. Report any errors or omissions to your supplier.

   See Appendix A in *Meridian Mail Modular Option Site and Installation Planning Guide* (NTP 555-7041-200) for a list of part numbers.

6   Repack the hardware components in their boxes until you are ready to install the system.

7   Place the modules in a safe, dry location in the equipment room close to the final location.

8   Remove the pre-installed printed circuit packs (PCPs) from each new module, following " Removing and reinstalling printed circuit packs" on this page, and check for any loose parts, broken edges, and other obvious damage.

> ⚠ **CAUTION**
> **Risk of equipment malfunction**
>
> Take care to return each card to the module and the slot it came from. Although the voice processor cards in the VP/GSP slots look identical, they have different switch settings.

9   Inspect the remaining equipment for the following:
   - defects in the molded plastic covers
   - any loose items remaining in the shipping cartons
   - any obvious damage to the equipment

10   Use a flashlight to make sure there are no broken pins or shrouds on the backplane connectors.

Removing and reinstalling printed circuit packs

Removing and reinstalling PCPs

To remove and reinstall printed circuit packs (PCPs), follow these steps.

Step	Action

1   Open the ejectors on the pack, and gently pull the pack towards you until it clears the shelf.
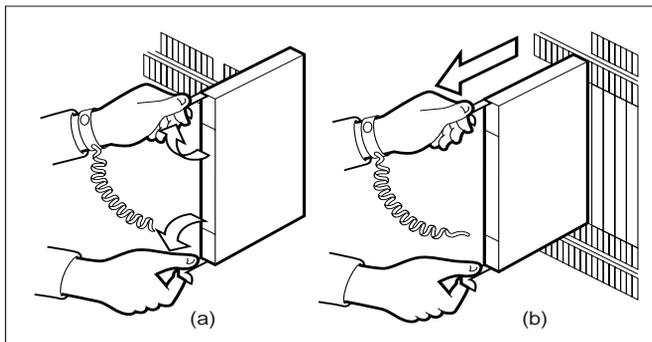
G100044

Note: The ejectors latch onto a pin on the pack. If the ejectors will not open, pinch them to raise them up and off the pin.

2   Check the pack to make sure it is not bent and there are no loose parts.

3   If you are not reinstalling the pack immediately, place the pack in an electrostatic discharge (ESD) protective container and place it in a safe location.

4   Reseat the pack in the module: align it with the slots in the module with the ejectors still in the open position, and then gently slide the pack back into the module.

5   Seat and lock the pack:
   a. Push on the upper and lower edges of the front of the pack until the pack is fully seated in the module.
   b. Close the ejectors.

Chapter 5

Installing a column or module

In this chapter

Overview

Introduction   The procedure for installing an equipment column or module
                           for Meridian Mail is identical to the procedure for installing a
                           Meridian 1/SL-1 column or module.

                           Since the relevant SL-1 documents were supplied with your
                           switch, the information is not repeated here. Instead, references
                           are given to the SL-1 documents.

                           The procedures you need to follow depend on whether you are
                           installing a new column or adding modules to a new or existing
                           column.

Installing a column

Procedure	Reference
Installing Meridian Mail columns	*SL-1 System Installation Procedures* (NTP 553-3001-210): Chapter, "Introduction," "Equipment handling precautions" section, except for the part on data disks
Installing earthquake protection, if needed	*SL-1 System Installation Procedures* (NTP 553-3001-210): Chapter, "Installing earthquake bracing"
Positioning and levelling the equipment	*SL-1 System Installation Procedures* (NTP 553-3001-210): Chapter, "Positioning and levelling equipment"
Installing AC grounding and power (AC-powered system)	*SL-1 System Installation Procedures* (NTP 553-3001-210): Chapter, "Installing AC power" *NT6D82 Power System: Description, Installation, and Maintenance* (NTP 553-3001-110)
Installing DC grounding and power (DC-powered system)	*SL-1 System Installation Procedures* (NTP 553-3001-210): Chapter, "Installing DC power" *NT6D82 Power System: Description, Installation, and Maintenance* (NTP 553-3001-110)

Installing a module

Procedure	Reference
Installing each Meridian Mail module	*SL-1 System Installation Procedures* (NTP 553-3001-210): Chapter, "Adding a module to a column"
	Note 1: References to overlay 37 apply only to a Meridian Mail module being added to an existing Meridian 1 column. Type Overlay 37 commands on the Meridian 1 console. Ignore the references to Overlay 37 if you are not adding a module to an existing Meridian 1 column.
	Note 2: If you are installing a shadowed node, install the backplane stiffener as described in this chapter before reconnecting the power and system monitor cables.
	If you are installing a shadowed voice node, install the load resistor as described in this chapter before reconnecting the power and system monitor cables.
	Note 3: If you are installing a module in a DC system, you cannot set power supply switches ON as instructed at the end of "Adding a module to a column" because you have not yet installed the power supplies.
	If you are installing a module in an AC system, leave the shelf breakers in the OFF position.

Module doors, side panel, and safety panel

Introduction

To install power supplies, disk drives, and tape drives, and to check the printed circuit packs (PCPs), you need to open the front door of the module. To install cables between modules and between Meridian Mail and the switch, you need to open the rear door of the module. For these reasons, leave the module doors open after installing the module.

You also need to remove the right side panel (as seen from the front) from each new module, and from each module on top of which you are adding a module. See the following illustration for the location of the side panel nuts at the rear of the module. There are similarly located nuts at the front. Remove all four nuts to free the side panel.

Remove the rear safety panel from each new module by turning the screws one-quarter turn counterclockwise. See the following illustration for the location of the screws.

Safety panel and side panel screw locations—rear of module
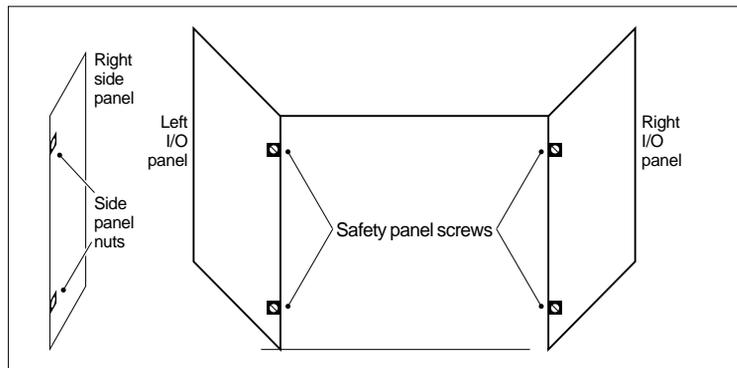
G100141

Installing a backplane stiffener

Introduction   You need to install a backplane stiffener on each disk-shadowed node before you reconnect the power and system monitor cables.

Installing the   To install the backplane stiffener, follow these steps.
backplane stiffener

Step	Action
1	If you are installing the backplane stiffener in the top module that contains the temperature sensor, proceed as follows:

   a. Gently remove the sensor.

   b. Disconnect the power plug and sensor plug, and gently bend the bracket that holds the power plug so that you can access the screw at A as shown in the illustration below.

Backplane stiffener

G100140

Step	Action
2	Remove the screws on the backplane at locations marked A and B as shown in the illustration above. Note whether they are machine threaded or not.
3	Position the backplane stiffener so that the holes in the flat extensions on the stiffener line up with the screw holes on the module.
4	Use the screws supplied with the stiffener to secure the stiffener tightly to the module. Make sure all cables are clear. If the screws removed in step 2 are machine threaded, use the machine-threaded screws supplied. Otherwise, use the self-tapping screws.
5	Reinstall the temperature sensor if it has been removed.
6	Reconnect the power plug and sensor plug if they have been removed.
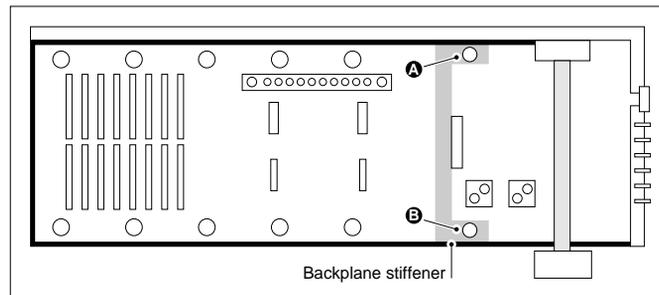
Installing a load resistor

Introduction

You need to install a load resistor on each disk-shadowed voice node before you reconnect the power and system monitor cables (see "Installing the load resistor" below). The resistor is mounted on the replacement side panel (P0710190) and is connected to the power terminal block (TB1).

Load resistor for disk-shadowed voice nodes
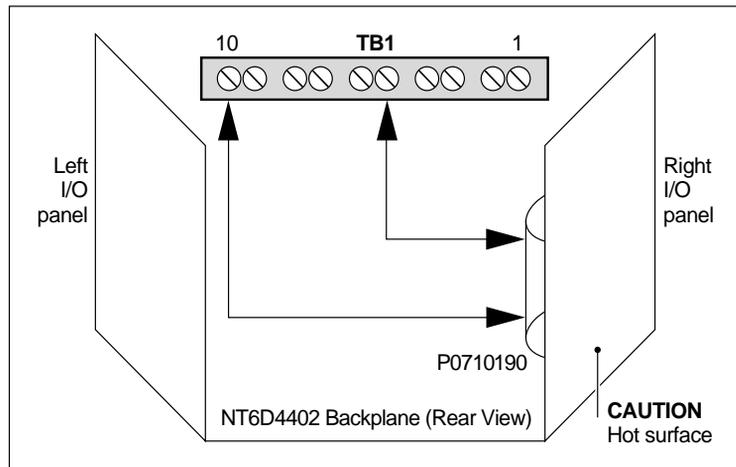
G100142

Installing the load resistor

To install the load resistor, follow these steps.

Step	Action
1	Remove the existing right side I/O panel (see the preceding illustration).
2	Install the new side panel (P0710190) in its place.
3	Connect the two wires from the resistor to terminal block TB1 connectors 5 and 10 on the backplane.

Identify nodes

Introduction   Nodes are identified by a label at the right side of the front of
the case. They are numbered node 1 to node 5, or as many nodes
as you have in your system.

If you are expanding an existing system by adding a new node,
the node is shipped with labels that allow you to choose the
node number.

Complete the installation of all nodes of your Meridian Mail
system before proceeding to the next chapter.

Chapter 6

Inspecting and installing the power supplies and mass storage units

In this chapter

Power supplies

Introduction   The following procedures outline how to install the power supplies.

Location of power supplies

Unshadowed node

- A voice node needs a power supply in the left common equipment power supply (CEPS) slot.
- A prime node needs power supplies in the left and right CEPS slots.

Shadowed node

- A shadowed node, either prime or voice, needs power supplies in the left and right CEPS slots.

Installing the CEPS (AC system)

To install the CEPS, follow these steps.

Step	Action
1	Verify that the power to the Meridian Mail module is off. Use the circuit breakers shown in the illustration below.

Location of CEPS
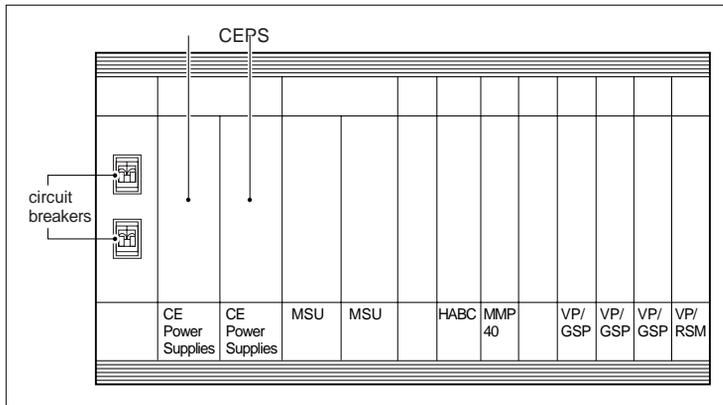
G100160a

Step	Action
2	Open the ejectors and align the power supply with the appropriate CEPS slot in the module. Refer to the illustration above.
3	Gently slide the power supply into the module, pushing on the upper and lower edges until it is fully seated in the module.
4	Close the ejectors.
5	Briefly turn on the power at the circuit breakers, and verify that the LED at the top of each CEPS lights. a. If the LEDs light, turn the power off again. b. If they do not, follow the procedures in Chapter 14, "Troubleshooting startup problems."

Installing the DCEPS (DC system)

To install the DCEPS, follow these steps.

Step	Action
1	Verify that the switches on the DC common equipment power supply (DCEPS) are off.

Step	Action
2	Open the ejectors and align the power supply with the appropriate DCEPS slot in the module. Refer to the following illustration.

Location of DCEPS

G100158a

Step	Action
3	Gently slide the power supply into the module, pushing on the upper and lower edges until it is fully seated in the module.
4	Close the ejectors.
5	Briefly turn on the switches on the DCEPS, and verify that the LED at the top of each DCEPS lights. a. If the LEDs light, turn the power off again. b. If they do not, follow the procedures in Chapter 14, "Troubleshooting startup problems."

Overview of disk drives

Introduction   The disk units used in Meridian Mail are shown in the following table. Each Meridian Mail disk drive is mounted in a mass storage unit (MSU) cage. The NT designation and the A0 product code applies to the drive in its cage, and not to a "bare" drive.

Disk and disk/tape assemblies

Assembly number/ common product code (CPC)	Description	Models	Individual disk drive CPC
NT6D47BA/A0393283	300-Mbyte hard disk unit	Maxtor LXT340SY	A0351371
		Seagate ST3390N	A0602257
NT6D47AA/CA	300-Mbyte hard disk unit	Seagate ST4376N	A0344453
NT6D47DA/A0398354	300-Mbyte disk and 250-Mbyte tape	Seagate ST5660	A0616840
		Seagate ST3390N	A0602257
		Maxtor LXT340SY	A0351371
NT6D48AA/A0365883	600-Mbyte hard disk module	Maxtor XT8760S	A0354197
NT6D48DA/A0398355	1-Gbyte disk and 250 Mbyte tape	DEC DSP3105 or DSP3107	A0383809
		Seagate ST11200N	
		Maxtor MXT1240	
		Seagate ST31230N/ ST32430N	A0616792
		DEC DSP3107	

Assembly number/ common product code (CPC)	Description	Models	Individual disk drive CPC
NT6D48BA/A0393284	1.2-Gbyte hard disk unit	DEC DSP3105 or DSP3107	A0383809
		Seagate ST11200N	
		Seagate MXT11200N	
		DEC DSP3107	A0616792
		Seagate ST31230N/ ST32430N	
NT6D48EA/A0629940	1.0-Gbyte disk and 2.5-Gbyte tape	Seagate ST31230N/ ST32430N	A0616792
		Seagate ST51080N	A0645393
NT6D48FA/A0658624	2.0Gbyte disk unit	Seagate ST32151N	A0658640
NT6D48GA/A0658625	2.0-Gbyte disk/tape unit	Seagate ST32151N	A0665539
NT6R14AA	4.0-Gbyte disk unit	Seagate ST34573N	

Disk or disk/tape unit installation

The procedure "Installing the disk or disk/tape unit" on page 6-8 explains how to install the disk or disk/tape unit in a Meridian Mail node. Nodes have different combinations of disk, tape, and disk/tape units according to whether they are shadowed and whether they are prime or voice.

Node combinations: Shadowed/unshadowed

Shadowed	**prime**	L) primary disk mounted with tape
		R) secondary disk
	voice	L) primary disk
		R) secondary disk
Unshadowed	**prime**	L) primary disk
		R) tape
	voice	L) primary disk
	L=Left R=Right	

<table>
<tr><td>

⚠️

</td><td>

CAUTION
Risk of equipment damage

Use extreme care and wear an antistatic wrist strap when installing the disk unit. It is susceptible to damage from rough or improper handling and from electrostatic discharge.

</td></tr>
</table>

Note 1: There are slight variations on these disk drives, so your disk drive may not look exactly like the ones pictured on pages 6-10 to 6-21 (even though the model number is the same).

Note 2: Each disk or disk/tape unit is labeled to show the node number for which it is configured. The disk label for a shadowed node indicates whether the drive is primary or secondary. The single drive for an unshadowed node is a primary drive. Check the label and install the disk or disk/tape unit into the correct position in the correct node.

Note 3: The disk drives must have their onboard terminator resistors removed. Primary drives (except node 1), which require terminating resistors, have an external resistor plug installed on the 50-pin AMP connector on the SCSI cable between the disk drive and the back of the drive cage. See the following illustration.

SCSI cable external terminating resistor plug

G100145

Installing the disk or disk/tape unit

To install the disk or disk/tape unit, follow these steps.

Step	Action
1	Verify that the disk or disk/tape unit has the correct PEC, including suffix. It must be the same as the one on your packing slip.
2	Confirm the jumpers and terminators on the disk drive according to the disk drive illustrations that follow this procedure. See also " Disk slots, SCSI IDs, and terminators" on page 6-9.
3	Verify that the power to the Meridian Mail module is off. For a DC system, use the switches on the DCEPS shown in "Location of DCEPS" on page 6-4. For an AC system, use the shelf breakers shown in " Location of CEPS" on page 6-3.
4	Open the locking levers and align the disk unit with the appropriate MSU slot in the module (refer to the following illustration). Gently slide the unit into the slot, pushing on the upper and lower edges until the unit is fully seated in the module.

MSU slot location

G100159

Step	Action
5	Close the locking levers.

Disk slots, SCSI IDs, and terminators

Disk	MSU slot	SCSI ID	Terminators
Primary (node 1)	Left	0—no SCSI ID jumpers	None
Primary node (2, 3, 4...) other than node 1	Left	0—no SCSI ID jumpers	On SCSI cable AMP connector
Secondary drive in a shadowed node	Right	2—SCSI ID jumper on A1 indicating SCSI ID=2	Off

For further information on disk shadowing, see "Enabling/disabling disk shadowing" on page 13-11.

Seagate ST3390N disk drive connectors and jumper settings

SCSI ID settings for J5

PCB

A2 A1 A0

SCSI I/O connector

For SCSI ID

A2	A1	A0	SCSI ID
0	0	0	= 0
0	0	1	= 1
0	1	0	= 2
0	1	1	= 3
1	0	0	= 4
1	0	1	= 5
1	1	0	= 6
1	1	1	= 7

1 = IN
0 = OUT

Terminator settings (J6)

PCB

3 1
4 2

DC power connector

Terminator settings (J9)

3

PCB

5 1
6 2
4

DC power connector

Settings for J12

PCB

5 3
7 1
8 2
Parity setting — 6 4

SCSI I/O connector

DC power connector

J5 J6

J9

J12
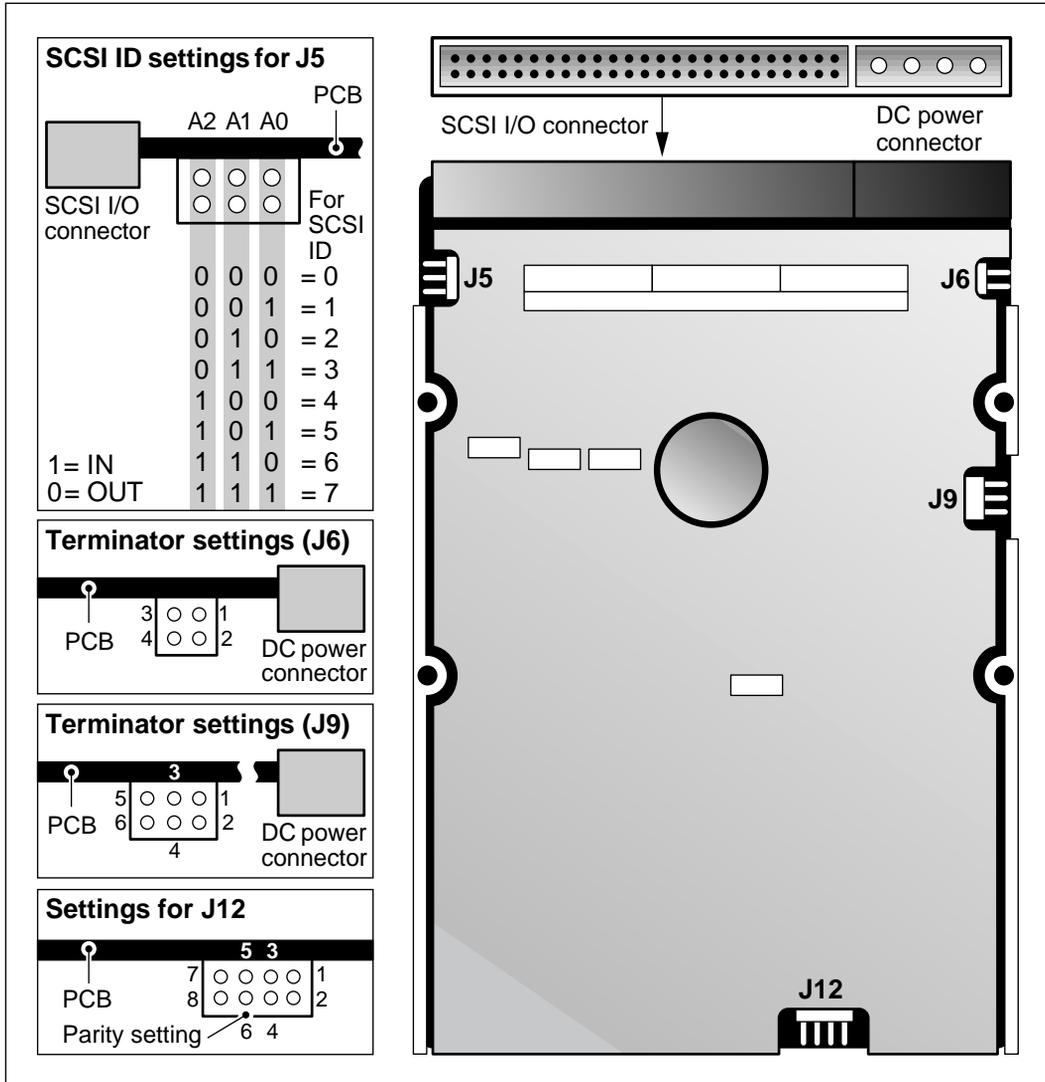
G100089

Maxtor LXT340SY disk drive connectors and jumper settings

J1 SCSI I/O connector

DC power connector

A2 A1 A0

J6

J7

J4

SCSI ID settings for J6

A2 A1 A0

			For SCSI ID
0	0	0	= 0
0	0	1	= 1
0	1	0	= 2
0	1	1	= 3
1	0	0	= 4
1	0	1	= 5
1	1	0	= 6
1	1	1	= 7

1 = IN
0 = OUT

Settings for J6

A2 A1 A0

Motor start jumper

Parity jumper

Settings for J7

11 9 7 5 3 1

12 10 8 6 4 2

Single ended
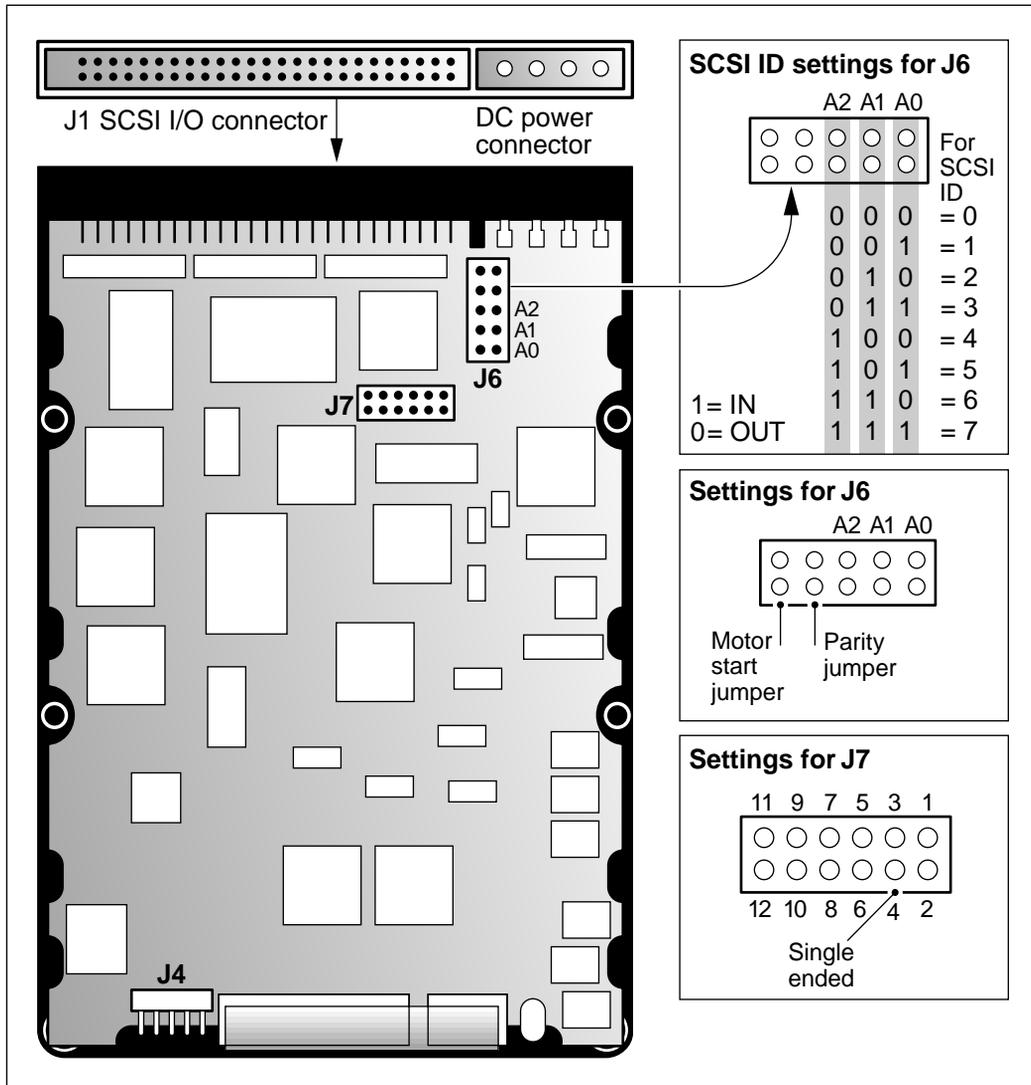
G100008A

Seagate ST4376N disk drive connectors and jumper settings
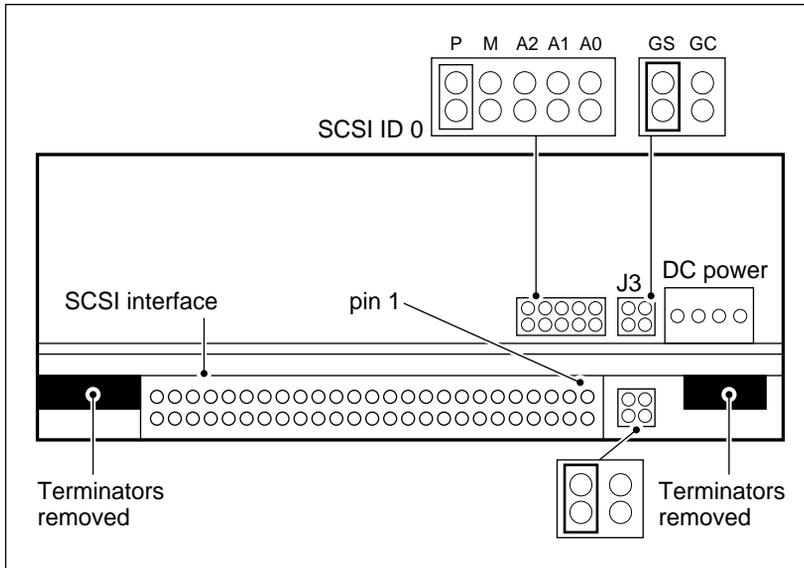
G101354

Seagate ST5660 disk drive

SCSI I/O connector

DC power connector

A2
A1
A0

J5 (no jumpers)

Pin 1

J8

SCSI ID settings for Options J8

PCB side up

Pin 1

33   19 17 15   A0 A1 A2

2

34

Do not touch

For SCSI ID:

1 = IN   0 = 0 0 0
0 = OUT   2 = 0 1 0

Settings for Options J8

33   19 17 15   3 1

2

34

Terminator jumper

Parity jumper

Remote start jumper
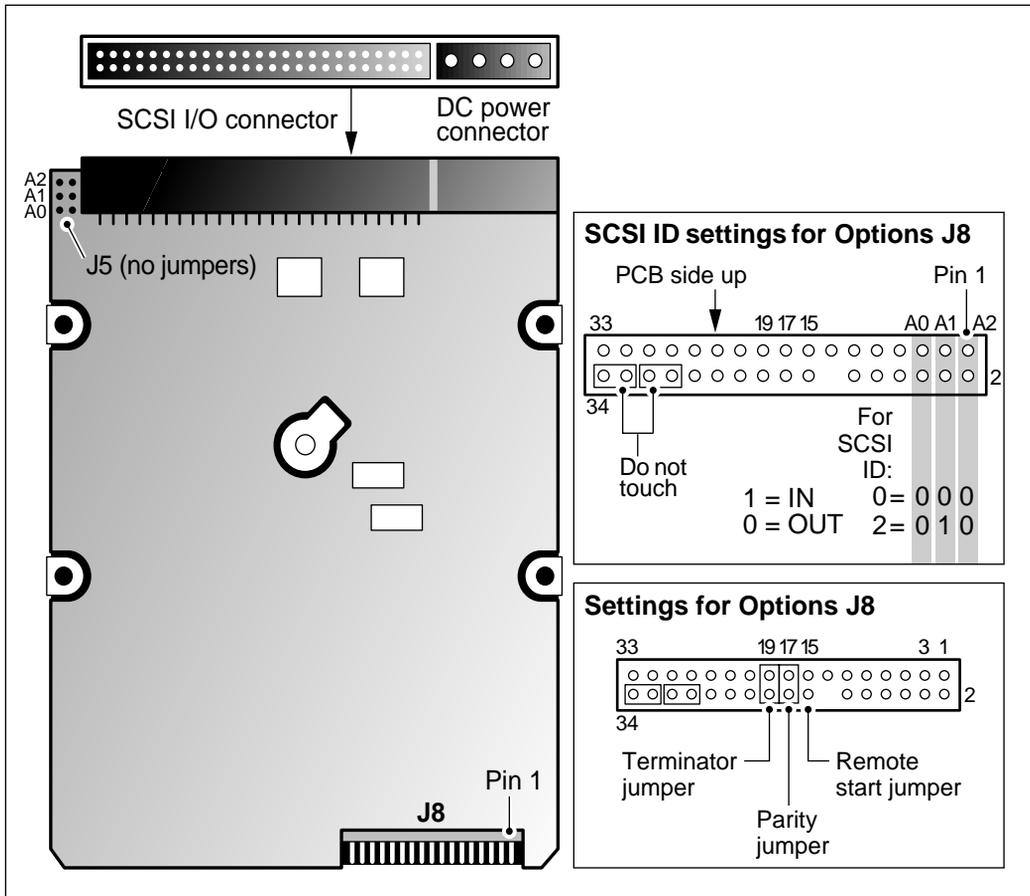
G101348

Maxtor/Sequel XT8760S disk drive connectors and jumper settings

MAXTOR 600-Mbyte disk drive
printed circuit board layout
(bottom of disk unit)

JP14

JP35, JP36, JP37

JP40, JP39, JP38

JP34

JP18 RN17   RN19   RN18 JP41

SCSI ID 0:	JP37 out, JP36 out, JP35 out (unshadowed)	
SCSI ID 2:	JP37 out, JP36 in, JP35 out (shadowed)	
Start drive:	JP14 in, JP38 out	jumper in
Local term. power:	JP41 in, JP34 out	jumper out
No write protect:	JP18 out	
No parity:	JP40 out	
Terminated (non-prime node):	RN17 in, RN18 in, RN19 in	
Non-terminated (prime node):	RN17 out, RN18 out, RN19 out	

G100011

Seagate ST11200 disk drive connectors and jumper settings
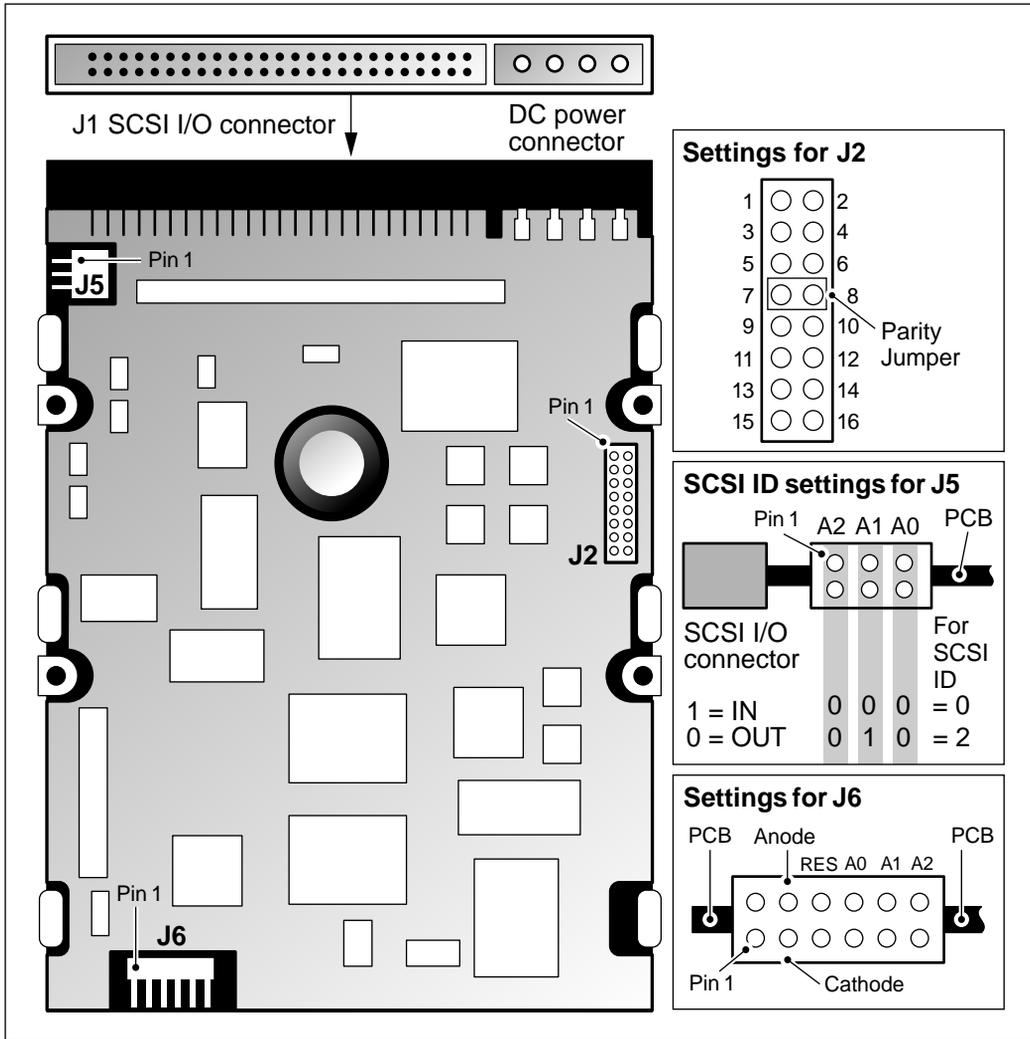
G101347

Maxtor MXT1240 disk drive connectors and jumper settings

G101346

DSP3107L disk drive connectors and jumper settings

J1 SCSI I/O connector

DC power connector

Termination header (no jumpers)

SCSI ID settings for Option J3

2 20
1 19

PCB

For SCSI ID:
0 = 0 0 0
1 = 0 0 1
2 = 0 1 0
3 = 0 1 1
4 = 1 0 0
5 = 1 0 1
6 = 1 1 0   1 = IN
7 = 1 1 1   0 = OUT

Settings for Option J3

Spinup on power jumper

2 20
1 19

PCB

Option J3

Pin 1
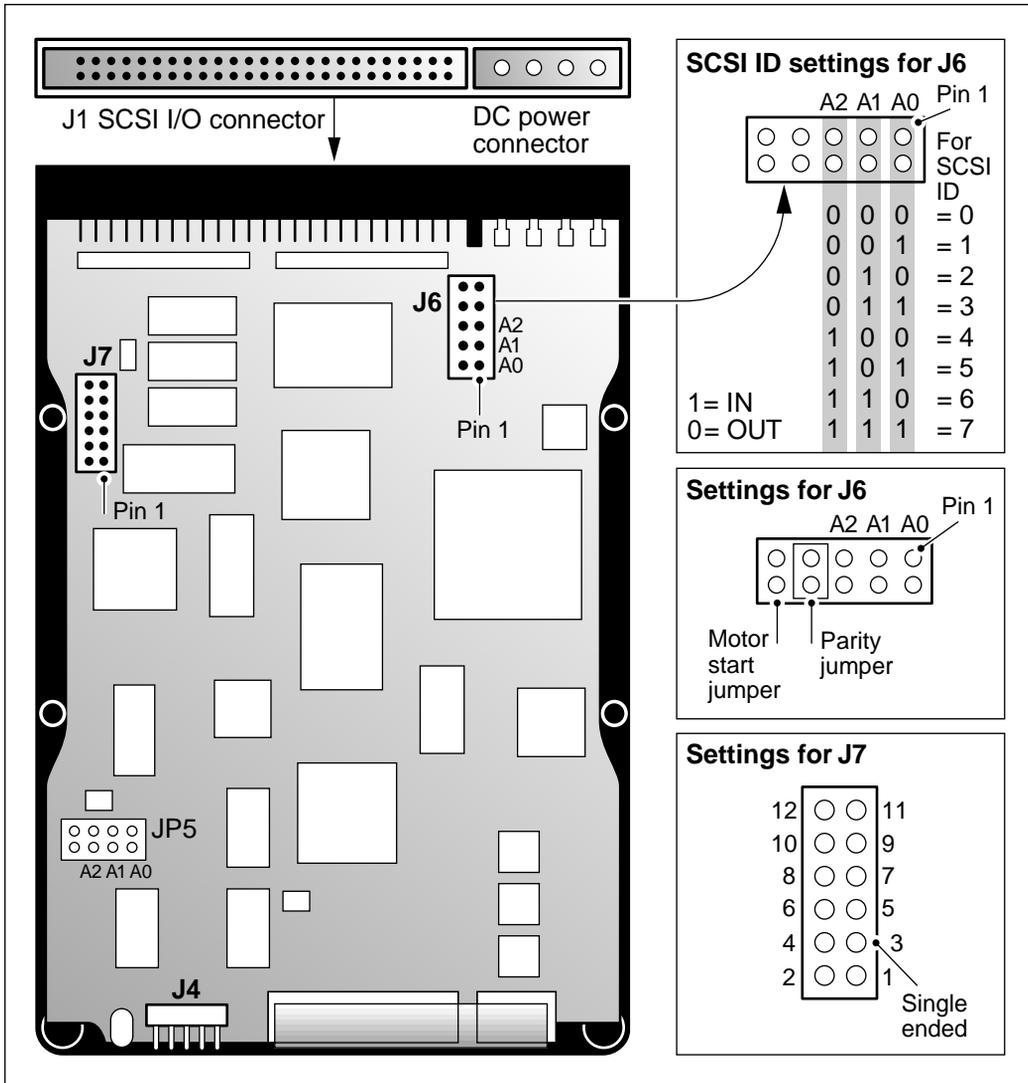
G101345

Seagate Hawk 2LP disk drive (ST31230N & ST32430N) connectors and jumper settings

DC power connector

J1 SCSI I/O connector

Pin 1

J5

J2

Pin 1

Settings for J2

Pin 1

TP
TP
SS
PE — Parity Jumper
WP
ME — Motor start jumper
DS
TE

SCSI ID settings for J5

PCB A2 A1 A0 PCB

J1 SCSI

Pin 1

For SCSI ID

1 = IN   0 0 0 = 0
0 = OUT   0 1 0 = 2

Settings for J6

PCB   Cathode   PCB
RES SSP
LED A0 A1 A2
Pin 1   Anode   Reserved
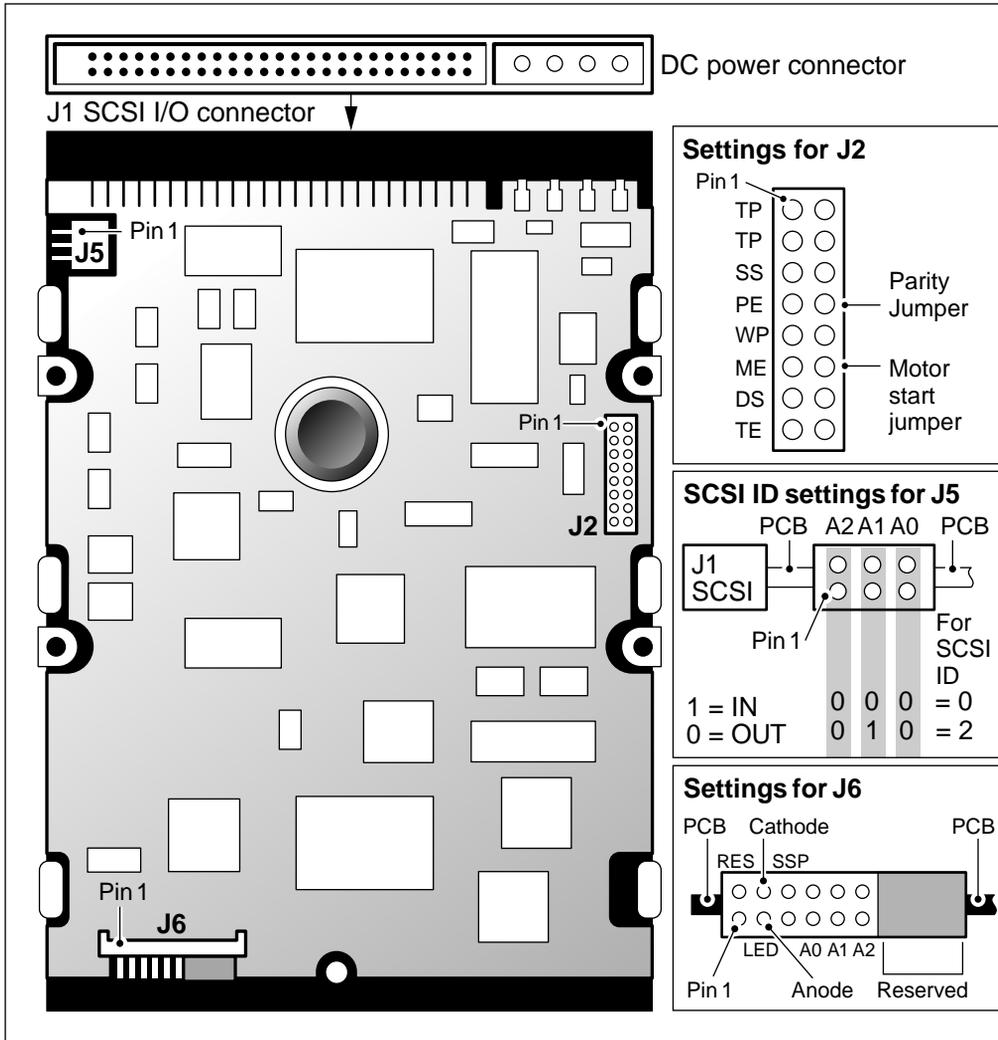
G101343

Seagate ST32151N disk drive and jumper settings

DC power connector

J1 SCSI I/O connector

Settings for J2

TP	○ ○
TP	○ ○
RES	○ ○
PD	○ ○
WP	○ ○
ME	○ ○
DS	○ ○
TE	○ ○

J2

SCSI ID settings for J6

PCB   Pin 1   PCB

A0 A1 A2

For SCSI ID

A0	A1	A2		
0	0	0	=0	Primary
1	0	0	=1	
0	1	0	=2	Secondary
1	1	0	=3	
0	0	1	=4	
1	0	1	=5	
0	1	1	=6	1 = IN
1	1	1	=7	0 = OUT

Pin 1

J6
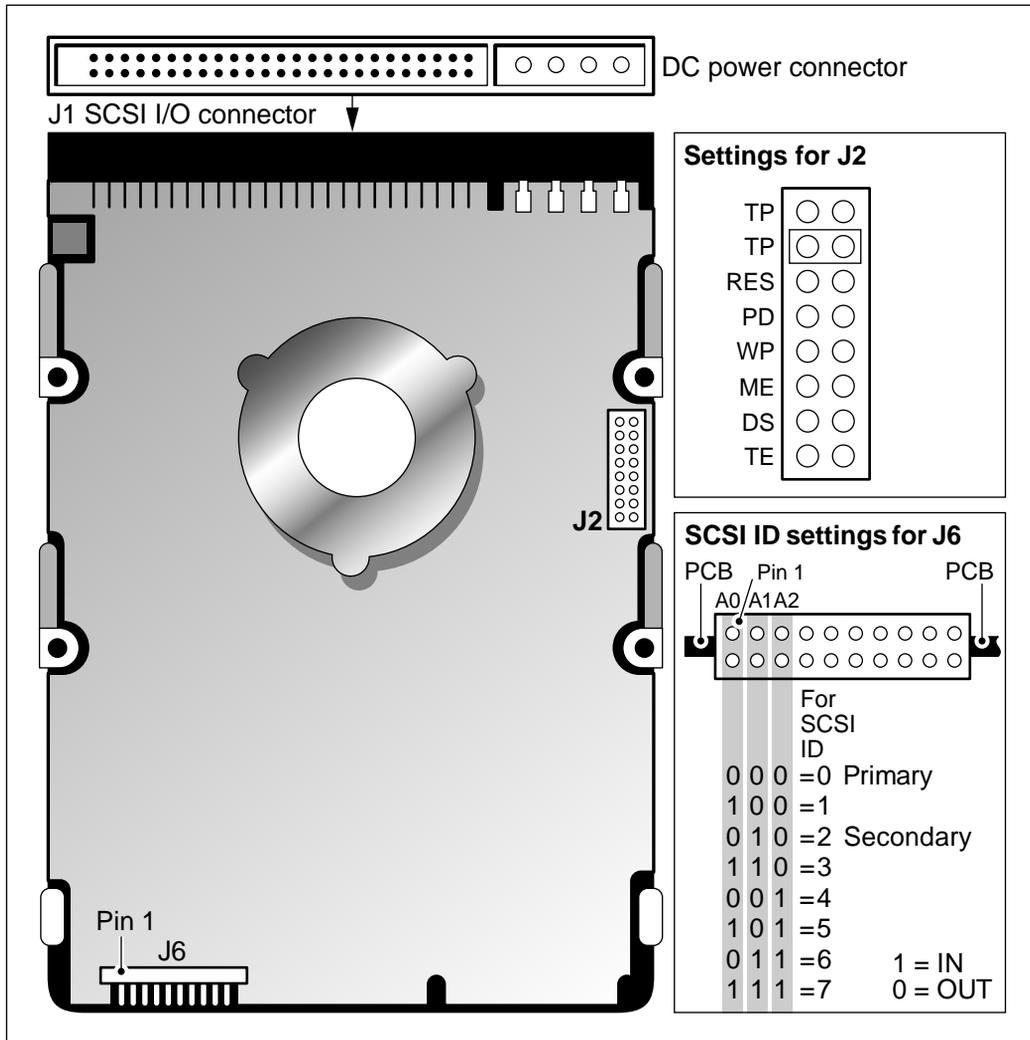
G101353

Seagate ST51080N disk drive and jumper settings
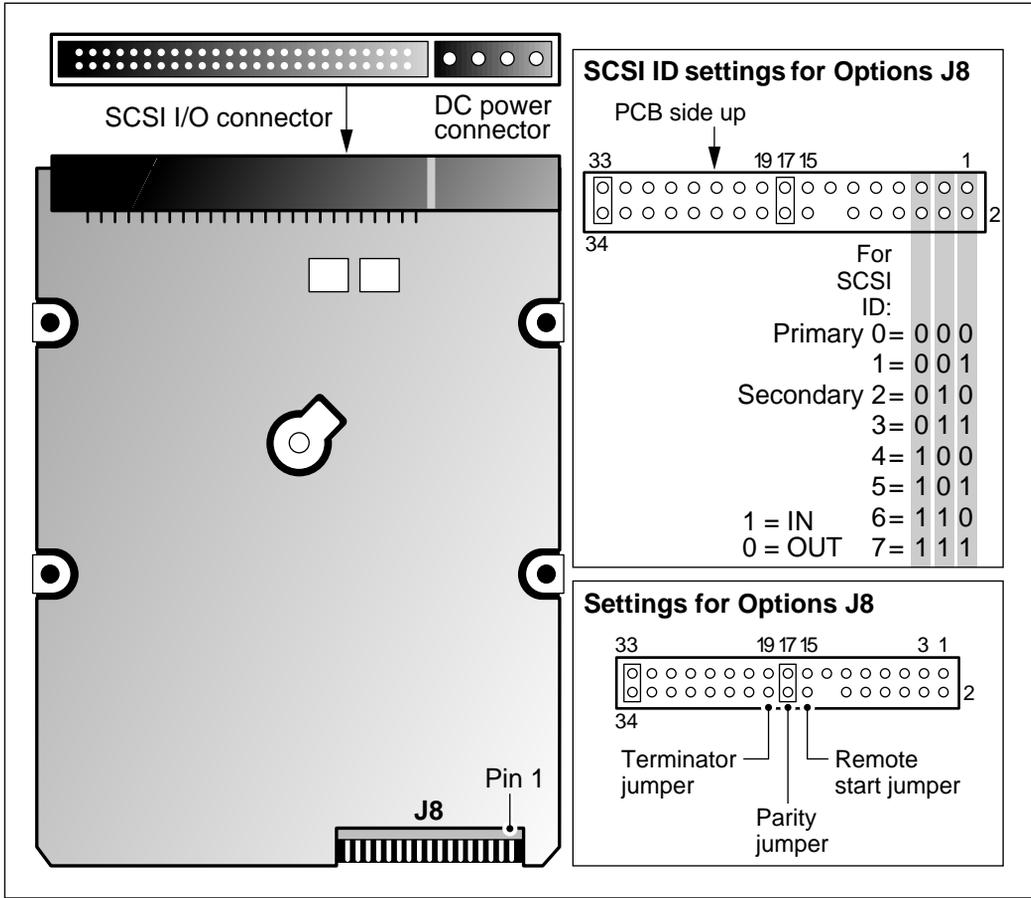
G101352

Seagate ST34573N disk drive and jumper settings

SCSI I/O connector J1   DC power connector

Settings for J2

Pin 1

TP
TP
RES
PD
WP
ME
DS
TE

Pin 1

J2

SCSI ID settings for J6

PCB   Cathode   PCB
A0 A1 A2   LED

Pin 1   RES Reserved

Anode

For
SCSI
ID
0 0 0 =0 Primary
0 1 0 =2 Secondary

1 = IN
0 = OUT

Pin 1

J6
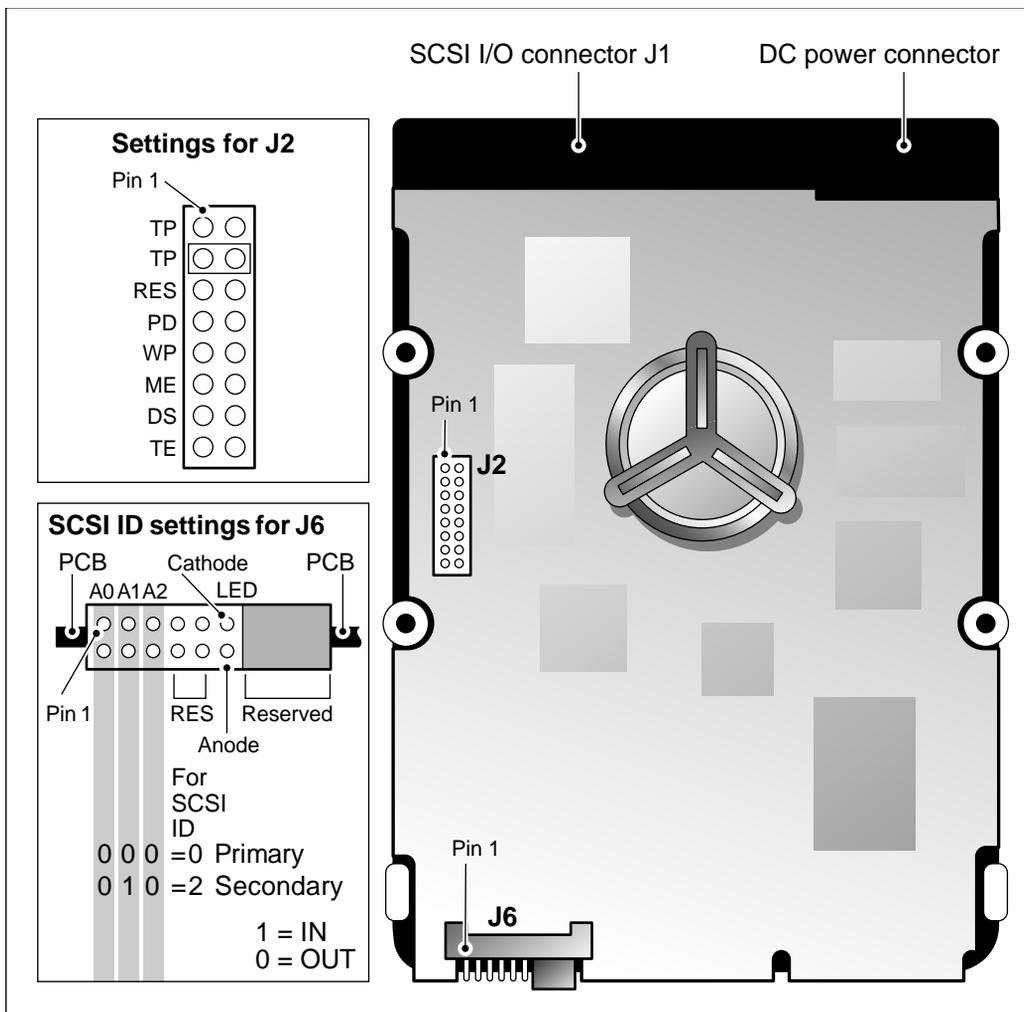
G101341

Overview of tape drives

Introduction

The tape unit used with Meridian Mail Options is either the high-density Tandberg tape drive (NT4R28BA) or the Archive (Viper) tape drive (NT4R28AC).

Nortel Networks ships the appropriate backup tape with the tape drive assembly. The following table lists some of the backup tapes.

CPC code	Description
A0369779	DC6150 backup tape
A0368760	DC6250 backup tape
A0630697	2.5-Gbyte Magnus backup tape (only for a Tandberg drive)

CAUTION

Risk of data loss

If you are using the DC6250 tape, you should not revert back to the DC6150 tape as this can cause data errors when reading from the tape.

Procedures

The procedures in this section describe the following:

- how to remove the mass storage unit (MSU) from the Meridian Mail Options system
- how to install the MSU into the Meridian Mail Options system, which involves
    - setting the SCSI ID on the tape drive
    - actually installing the tape drive

Removing the MSU

Removing the MSU   To remove the MSU, follow these steps.

Step	Action
1	Power off the prime node.
2	Remove the tape or disk/tape unit by opening the ejectors and then carefully sliding the unit out.
3	On the replacement unit, look for the tape drive jumper settings, and ensure that they are configured as shown in the illustrations on the following pages.
4	If the node is shadowed, see "Replacing a primary (left side) disk or disk/tape unit in a shadowed system" on page 16-8.
5	Install the new unit in the same MSU slot as the unit you are replacing by carefully sliding the unit in and locking the ejectors in place.
6	Reboot the system.

Installing the MSU

Setting the SCSI ID for the tape drive

To set the SCSI ID for the tape drive, follow these steps.

Step	Action
1	Locate the header beside the SCSI connector.
	Archive—This is the 3-by-6 header (see "Archive tape drive" on page 6-26 and "Archive tape drive jumper settings" on page 6-27).
	Tandberg—This is the 2-by-10 header (see "Front view of Tandberg tape drive connectors" on page 6-27 and "Tandberg tape drive connectors and jumper settings" on page 6-28 for the header location).
2	Set the SCSI ID to 1.
	Archive—This involves removing any jumpers on the header in positions ID1 and ID2 and inserting a jumper on the header in position ID0 as shown in "Archive tape drive" on page 6-26 and "Archive tape drive jumper settings" on page 6-27.
	Tandberg—This involves inserting jumpers on the header in position 0 and Parity as shown in "Front view of Tandberg tape drive connectors" on page 6-27 and "Tandberg tape drive connectors and jumper settings" on page 6-28.
	Terminating resistors must be installed in the Meridian Mail module prime node.
	Note: Refer to the figures and ensure that all other settings (for example, Parity) have been correctly set.
3	Ensure that the tape drive terminator resistor packs are removed as indicated in the figures.
4	Verify the other jumpers as shown (see the tape drive illustrations on pages 6-26 to 6-28.)

Installing the MSU   To install an MSU, follow these steps.

Step	Action
1	Check that the jumper settings are correct as shown in the illustrations on the following pages.
2	Make sure no SCSI bus terminator is mounted on the tape drive (see the illustrations on the following pages).
3	Slowly insert the MSU.
4	At the rear side, connect the SCSI interface cable with the red stripe in pin #1, and connect the harness cable into the power connector (12 V, 5 V, and ground) of the tape. *Note:* There are two power harness cables. One is extra. Secure it for safety.
5	Make sure the MSU is mounted securely. Tighten the mounting with the screws.
6	Insert the power converter pack (QPC585). *Note:* DC6150 and DC6250 tapes are recommended for backup on Viper drives, and the 2.5-Gbyte Magnus tape is recommended for the Tandberg. You are advised to use one type of tape for backups to help reduce tape drive wear.

Archive tape drive
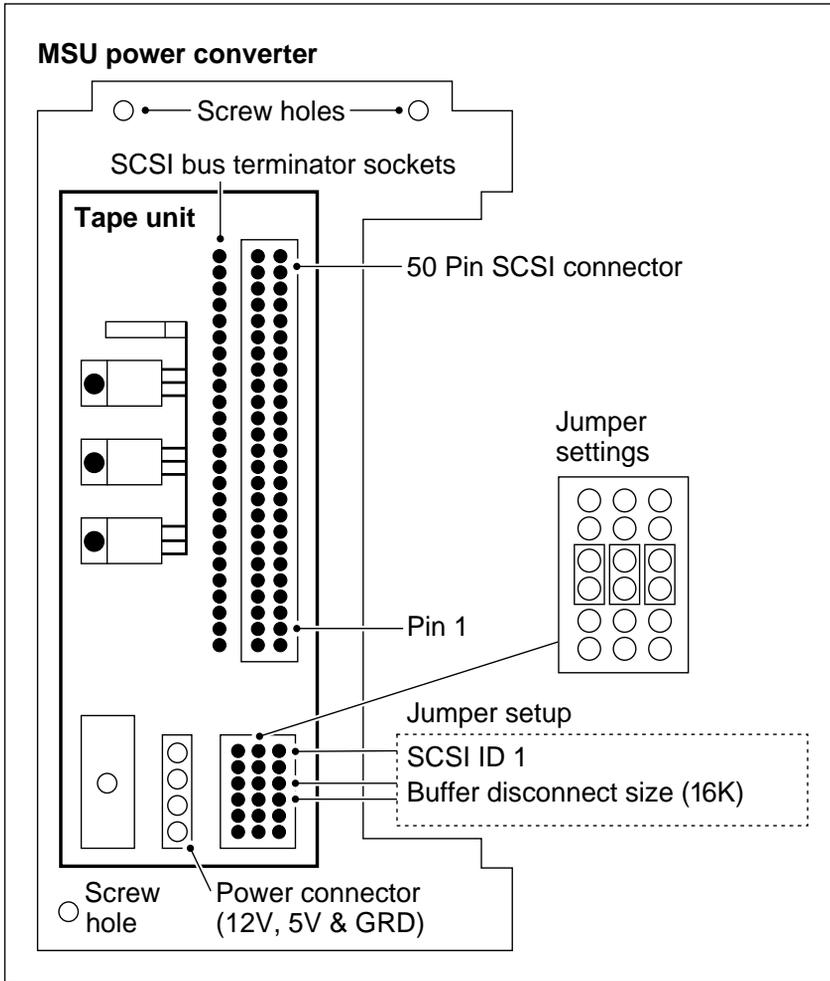
G100006

Archive tape drive jumper settings
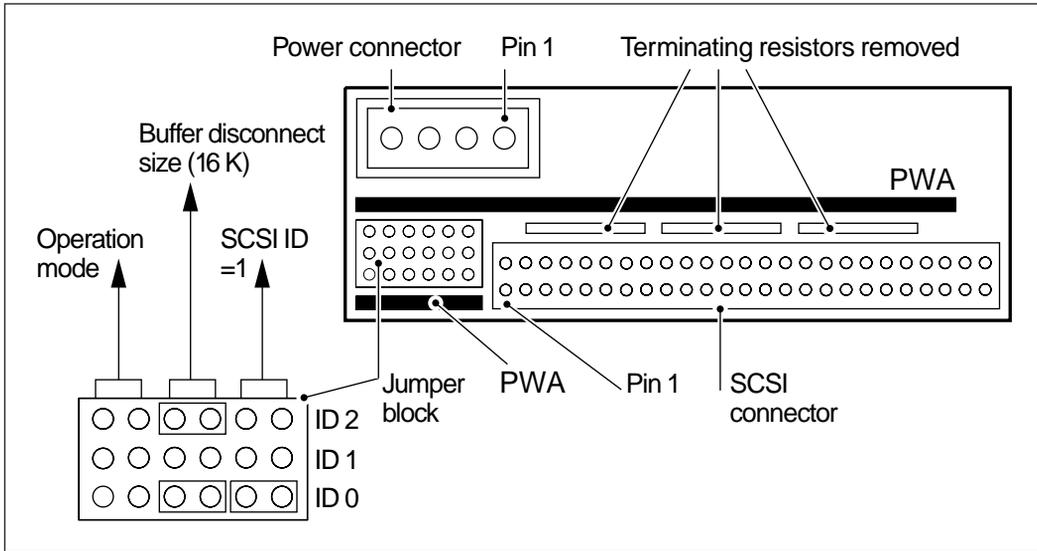
G100025

Front view of Tandberg tape drive connectors
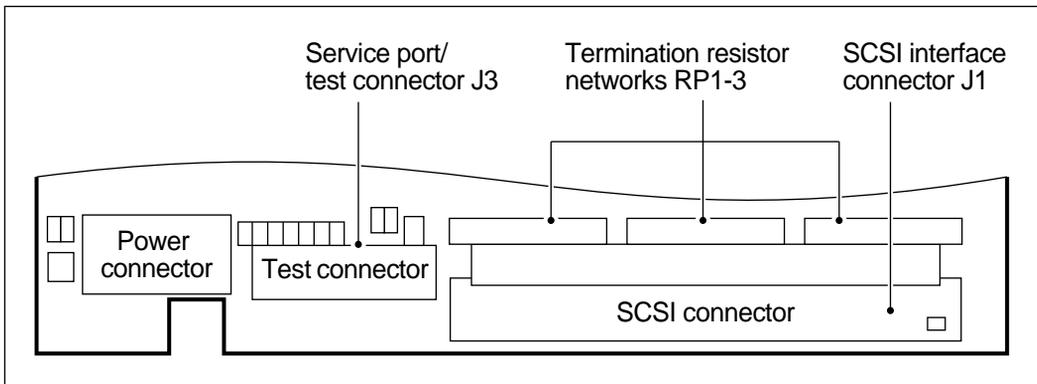
G100022

Tandberg tape drive connectors and jumper settings

Terminating resistors removed

Tpwr

Select 0

1

2

SCSI ID= 1

Parity

In

Out

Test

G100016
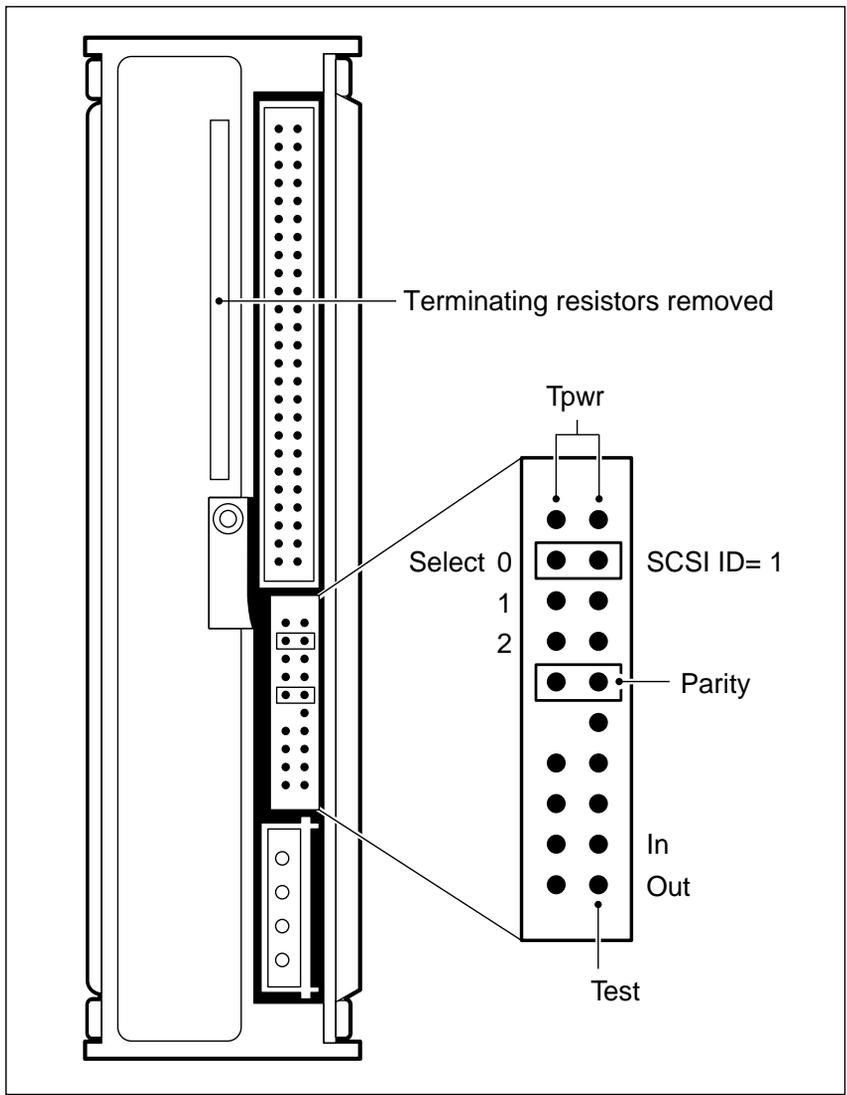
Chapter 7

Converting to Meridian Mail Release 13

In this chapter

Overview

Introduction   If you are converting from an existing Meridian Mail system,
                          then any hardware installation or modification must be
                          performed as part of the software installation. The *System
                          Installation and Modification Guide* (NTP 555-7001-215)
                          discusses all the necessary steps for software (system)
                          installation, release conversion, and hardware modification.
                          When necessary, the *System Installation and Modification
                          Guide* refers back to this manual for hardware installation
                          information.

Before you begin   Before beginning the system installation and modification
                          procedures, unpack and inspect the new hardware as described
                          in Chapter 4. Then refer to the *System Installation and
                          Modification Guide* to begin the conversion to Release 13.

                          Note: If you are also expanding your system (adding nodes),
                          then you still need to start with the *System Installation and
                          Modification Guide* to perform the release conversion before
                          expanding the system.

System speed   For Release 13 of Meridian Mail, an MMP40 or Enhanced
                          MMP40 card is required on all nodes (one MMP40 or Enhanced
                          MMP40 card per node). A multi-node system can support a
                          hybrid of Enhanced MMP40 and MMP40 cards.

                          Note: If you are upgrading from Meridian Mail Release 9 or
                          earlier, the Enhanced MMP40 card allows the system to be
                          upgraded to run at 9600 bps. This upgrade is optional, as the
                          system will run at 2400 baud. The most important aspect of
                          deciding to run at either speed is to ensure that the console or
                          terminal and modems are set to match the speed of the installed
                          BootROM.

                          To facilitate the conversion, a speed change utility is available
                          either through the Install/data tape during installation, or
                          through the TOOLS level menu after installation. Use the speed
                          change utility to select the appropriate speed.

To facilitate the conversion, a speed change utility is available either through the Install/data tape during installation, or through the TOOLS level to select the appropriate speed.

Converting to Release 13

Introduction

The following table shows the equipment you need to replace when installing an Enhanced MMP40 node.

Equipment to be replaced when converting from ESBC to Enhanced MMP40 node

Equipment	Replace with
ESBC card	Enhanced MMP40 card
SCSI card	No replacement (removed)
2.0Mbyte/2.5-Mbyte memory card	No replacement (removed)
SCSI cable (NT6D4409)	SCSI cable (NT6D4417)
CSL/SMDI cable (NT6D4410)	CSL/SMDI cable (NT6D4419)
CRT cable (NT6D4405)	Combined with CSL/SMDI cable
Null modem cable (NTND82AA/AB) from ESBC to A/B switch box	Straight RS-232 cable (NTND91AA/ AB) from MMP40 to A/B switchbox
Designation strip	New designation strip (A0803252) can be mounted on original strip

---

ATTENTION

Enhanced MMP40 or MMP40 cards must be used for both the primary node and all voice nodes. Other types of cards cannot be substituted or used with the Enhanced MMP40 or MMP40 cards.

You must also replace the null modem cable (NTND82AA/AB) between the Enhanced MMP40 or MMP40 and the A/B switchbox with a straight RS-232 cable (NTND91AA/AB). Refer to "Overview of Meridian Mail peripherals" on page 11-3 for proper cable configurations.

Note: The ESBC configuration *does not* support Meridian Mail 9 or later. To upgrade from Meridian Mail Release 8 or earlier, perform the Enhanced MMP40 hardware upgrade.

Conversion requirements

Hardware conversion requirements depend on whether your system already has Enhanced MMP40 (or MMP40) cards installed. The conversion is also affected by the selected terminal baud rate (2400 or 9600 bps). See the following table for an overview of the hardware requirements for each conversion scenario.

Hardware requirements

Hardware	Current configuration	After conversion	Hardware change required
CPU card	68K card in any node	Enhanced MMP40 card in each node	Insert Enhanced MMP40 card in every node. See "Replacing the 68K card" on page 7-7.
	MMP40 card in each node	Enhanced MMP40 or MMP40 card in each node	One or more Enhanced MMP40 or MMP40 cards may be added.
Terminal baud rate	Terminal set to 2400 bps	Terminal set to 2400 bps	No change
	Terminal set to 2400 bps	Terminal set to 9600 bps	Install high-speed modem. See "Installing a 9600 bps modem" on page 7-9.
Tape drive	Archive Viper	Archive Viper	No change
	Archive Viper	Tandberg TDC4220	Install Tandberg tape drive. See Chapter 16.

System speed

All Enhanced MMP40 cards are shipped from the factory with a default baud setting of 2400 bps. If you decide to use the 9600 baud rate for your system, you either have to configure your modems to higher speeds or install new high-speed modems. When the Enhanced MMP40 cards are installed with high-speed modems, if required, you must complete a system conversion to the Meridian Mail Release 13 software.

The Install/data tape is used to convert the existing Modular Option system to Release 13. If you are converting from Meridian Mail 10, use the existing speed set on the card (either 2400 or 9600 bps). If you are converting from an earlier release than Meridian Mail 10, then only 2400 bps is supported. (The existing terminal or modem should already be set to the correct

speed for your system to be operating on the previous release; no action should be necessary.

The conversion must be performed as described in the *System Installation and Modification Guide* (NTP 555-7001-215). During the conversion, when the System Modification and Installation menu is displayed, select the appropriate option to complete the software conversion to Release 13.

When the *System Installation and Modification Guide* instructs you to install the new hardware, refer back to this chapter for instructions.

For 2400 bps systems, no additional steps are required once the conversion is succcessfully completed as described in the *System Installation and Modification Guide* (NTP 555-7001-215).

For a system that is to be set to 9600 bps, once the conversion is successfully completed, you must run the speed change utility to set the speed to 9600 baud (if the CPU card was not already programmed for 9600 bps). See the *System Installation and Modification Guide* for details.

Note: You run the utility after the conversion so that, if the conversion fails, the system can be restored to its previous state without having to reset the terminals and modems.

	CAUTION
⚠	**Risk of equipment damage**
	Wear an antistatic wrist strap when handling components. Handle components by the edges and, whenever possible, with the loosened packing material still around them.

Replacing the 68K card

Introduction

If your existing system currently uses 68K cards, replace them with Enhanced MMP40 cards.

Replacing the 68K card

To replace the 68K cards, follow these steps.

Step	Action
1	Unpack and inspect the new hardware as described in Chapter 4.
2	Refer to Chapter 3, "Comprehensive upgrade" in the *System Installation and Modification Guide* (NTP 555-7001-215), and follow the instructions. This will involve some preliminary steps, including doing a full backup of the system.
3	When the *System Installation and Modification Guide* instructs you to install the new hardware, continue with step 4 in this procedure.
4	Open the ejectors on the 68K card you are replacing, and gently pull the card toward you until it clears the shelf (see the illustration).

Note: Store the 68K card in a safe place. You will need this card if you need to reinstall the old system.

(a)   (b)
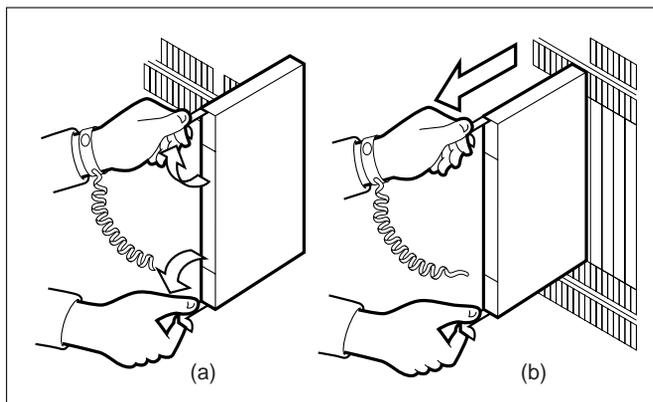
G100044

Step	Action
5	Insert the Enhanced MMP40 card in the module by aligning it with the slots formerly occupied by the 68K card. With the ejectors still in the open position, gently slide the card into the module.

Step	Action
6	Seat and lock the card by doing the following:
	a. Push on the upper and lower edges of the faceplate until the card is fully seated in the module.
	b. Close the ejectors.
7	Install the supplied designation strips (A0803253) on the Meridian Mail shelves.
8	If the terminal baud rate is to be changed to 9600 bps, continue with "Installing a 9600 bps modem" on page 7-9. If the terminal baud rate is to remain at 2400 bps, continue with step 9.
9	Return to the *System Installation and Modification Guide* to continue the system conversion.
	You have now finished all of the necessary hardware changes.

Installing a 9600 bps modem

Introduction   If you decide to upgrade your terminal baud rate to 9600 bps, you can install new high-speed modems or configure your existing modems for 9600 bps operation. Refer to Appendix B, "Modem configuration," to ensure that the modem is supported for 9600 bps operation.

Installing the modem   To install a 9600 bps modem, follow these steps.

Step	Action
1	Unpack and inspect the new modem.
2	Install the external modems as outlined in Chapter 11, "Installing and configuring peripheral devices."
3	Return to the *System Installation and Modification Guide* to continue the system conversion.
	You have now finished all the necessary hardware changes.

Chapter 8

Inspecting and installing PCPs and cables

In this chapter

Printed circuit packs

Introduction   The following printed circuit packs (PCPs) are used in Meridian Mail with Enhanced MMP40 or MMP40 installed. See the following table and " Inspecting PCPs" on page 8-4 for slot locations.

Meridian Mail PCPs

PCP	Slot	NT Code
HABC—High Availability Bus Controller (prime node of a multi-node system only)	HABC	NT4R08AA
Enhanced MMP40 (or MMP40)— Meridian Mail Processor 68040	MMP40	NT4R45AA
NVP—Network Voice Processor	VP/GSP or VP/RSM	NT4R01AA /AC
RSM—RS-232 Service Module	VP/RSM	NT4R03AA /AB

Card slot locations
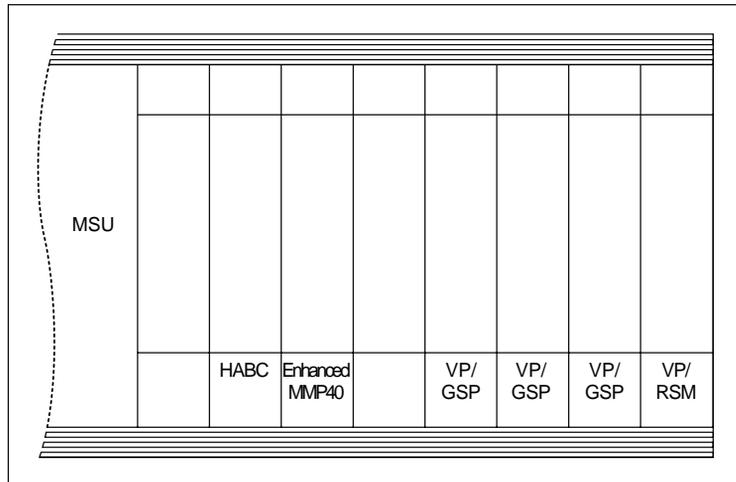
G100157

PCP inspection   PCPs are pre-installed in their nodes before delivery. However, it is recommended that you remove the packs from each new module, and check that the switch settings are correct.

Changes to PCPs during node expansion

When you are expanding a system by adding one or more nodes, PCPs may need to be moved from one node to another, and switch or jumper settings may need to be changed. The following table summarizes the changes that need to be made.

Summary of changes to PCPs for node expansion

Original # of nodes	New # of nodes	Pack	Changes
1	2	NVP	If three NVPs are present in node 1, move one to node 2. Reset the switches on the NVP being moved.
		Enhanced MMP40 (or MMP40)	Attach a terminator to the Enhanced MMP40 (or MMP40) in node 2.
		HABC	Attach the HABC terminator. Install the pack in HABC slot, node 1.
2	4 or 5	NVP	Remove all NVPs from node 1. Reset the switches on the NVPs being moved.
Any	Any	Enhanced MMP40 (or MMP40)	If the original number of nodes is not 1, remove the terminator from the Enhanced MMP40 (or MMP40) in the original last node. Attach a terminator to the Enhanced MMP40 (or MMP40) in last node.

CAUTION
Risk of equipment damage

Wear a wrist strap connected to the grounding point while handling PCPs to protect the packs against damage caused by static electricity.

Inspecting PCPs   To inspect PCPs, follow these steps.

Step	Action
1	Locate the PCP slot area in the Meridian Mail module to the right of the MSU slots. Refer to the illustration "PCP removal" below.
2	Remove the faceplate covering the PCPs. You can now see the designation strip at the bottom of the module. This strip identifies the locations of each pack. The VP/RSM slot and some VP/GSP slots may be empty depending on the system size.
3	Remove the cable connectors from the fronts of the packs.
4	Open the locking levers on each pack, and gently pull the pack toward you until it clears the shelf. (See the following illustration.)

PCP removal

(a)   (b)
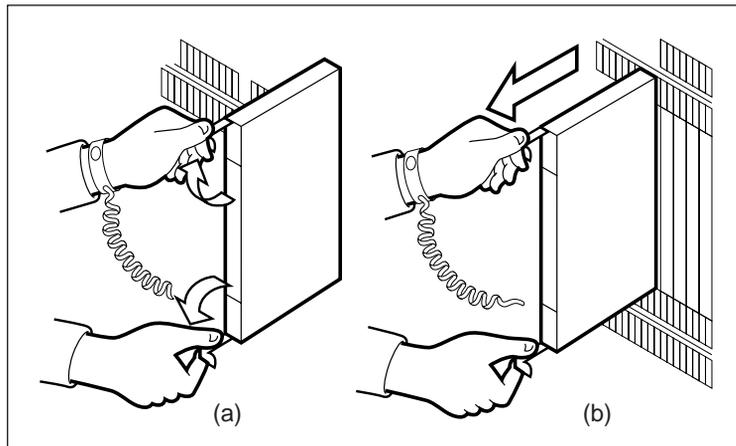
G100044

Step	Action
5	Check the pack to make sure it is not bent and there are no loose parts.
6	If you are not placing the pack back in the shelf immediately, put it in an electrostatic discharge (ESD) protective container labeled with the number of the node it came from and the card type from the designation strip.
7	Label each pack from a VP/GSP slot with a number from 1 to 3. Number the packs starting with 1 for the leftmost pack in the VP/GSP slots.

Step	Action
	" PCP switch locations and settings" below lists figures that show the locations of switches and jumpers on each pack, and the tables that show the settings for each switch and jumper.
	Note: Set the switches on each NVP pack to match the TNs selected for that pack.
8	Replace the pack in the shelf by aligning it with the slots in the shelf (the locking levers are still open) and gently sliding the pack back into the shelf.
	The designation strip at the bottom of the module identifies the locations of each pack. Refer to "Card slot locations" on page 8-2.
9	Seat and lock the pack.
	a. Push on the upper and lower front edges of the pack to ensure that it is fully seated in the shelf. It is particularly important to seat packs firmly with only one locking lever (for example, the MMP40).
	b. Close the locking levers.

ATTENTION

Take care to return each card to the module and the slot it came from unless instructed otherwise.

Although the voice processor cards in the VP/GSP slots and in the VP/RSM slot look identical, they have different switch settings.

PCP switch locations and settings

Printed circuit pack	Switch locations	Switch settings
HABC	See page 8-6	See page 8-6
Enhanced MMP40 (or MMP40)	See page 8-7	See page 8-8
NVP	See page 8-13	See page 8-14, page 8-15, page 8-16, page 8-17, page 8-17, page 8-18
RSM	See page 8-9	See page 8-10

High availability bus controller

Introduction

The high availability bus controller (HABC) pack is used in the HABC slot of the first node of a multi-node system. See the preceding table for references to switch locations and settings.

Note: The HABC pack needs a terminator daughterboard, NT4R10AA. The terminator is installed on the connector at the front of the pack. The bus cable runs from the HABC to the Enhanced MMP40 (or MMP40) card in each node, and ends on the terminator daughterboard on the Enhanced MMP40 (or MMP40) in the last node.

HABC switch locations

NT4R08AA
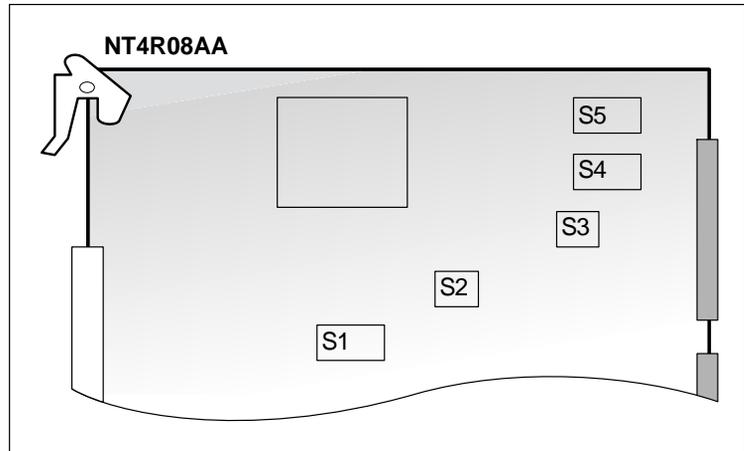
G100162

HABC switch settings

S1-1 = Off	S2-1 = On	S3-1 = Off	S4-1 = Off	S5-1 = Off
S1-2 = Off	S2-2 = On	S3-2 = On	S4-2 = Off	S5-2 = Off
S1-3 = Off	S2-3 = On	S3-3 = On	S4-3 = Off	S5-3 = On
S1-4 = Off	S2-4 = On	S3-4 = Off	S4-4 = Off	S5-4 = On
S1-5 = Off			S4-5 = Off	S5-5 = Off
S1-6 = Off			S4-6 = Off	S5-6 = Off
S1-7 = Off			S4-7 = Off	S5-7 = Off
S1-8 = Off			S4-8 = Off	S5-8 = Off

On = Closed
Off = Open

Enhanced MMP40

Introduction

The Enhanced MMP40 (or MMP40) card contains an MC68040 microprocessor, 16 Mbytes of memory, a SCSI interface, two programmable serial ports, and a BootROM that includes system diagnostics.

" Enhanced MMP40 (or MMP40) switch location" below shows the locations of the switches. "Enhanced MMP40 (or MMP40) switch settings" on page 8-8 lists the settings.

Note: In a multi-node system, the Enhanced MMP40 (or MMP40) pack in the last node needs a terminator, NT4R11AA. The terminator is installed on the largest (middle) connector at the front of the pack. The bus cable runs from the HABC in node 1 to the Enhanced MMP40 (or MMP40) card in each node, and ends on the terminator daughterboard on the Enhanced MMP40 (or MMP40) in the last node.

Enhanced MMP40 (or MMP40) switch location

NT4R45AA

S1
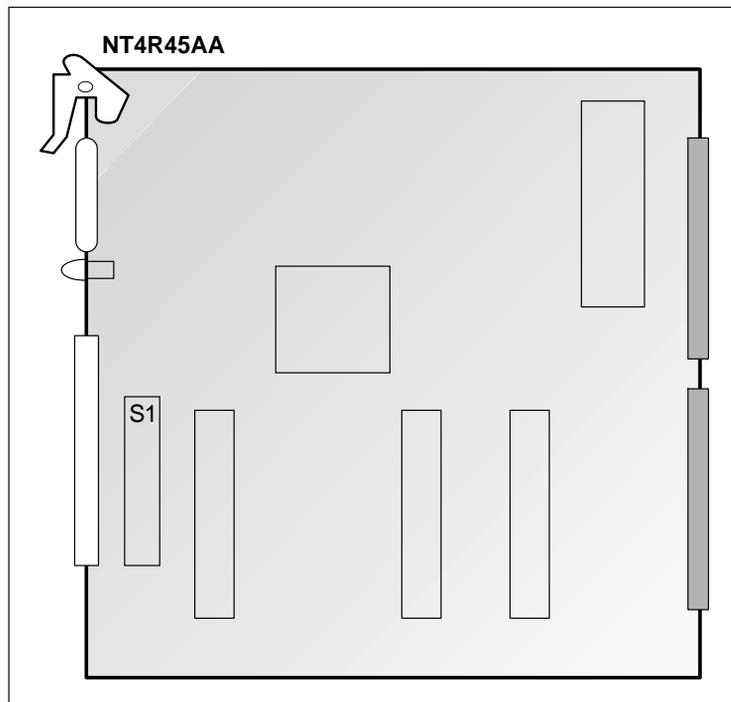
G100147

Enhanced MMP40 (or MMP40) switch settings

Switch settings—S1								
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**
Single-node systems								
Node 1	On	On	On	On	On	On	On	On
multi-node systems								
Node 1	On	On	Off	On	On	On	On	On
Node 2	Off	Off	Off	On	On	On	On	On
Node 3	On	Off	Off	On	Off	On	On	On
Node 4	Off	Off	Off	On	Off	On	On	On
Node 5	On	Off	Off	On	On	Off	On	On

JTAG/XChecker switch settings   The Modular Option processor board (NT6R14AA) has a JTAG/XChecker switch that needs to be set to allow loading. Verify that this switch is set according to the following table.

Board	Switch	S1	S2
NT6R14AA	S3	OFF	ON

RS-232 service module

Introduction

The RS-232 service module (RSM) pack provides four RS-232 ports as well as a battery-backed clock. The NT4R03AB version of the pack also includes a bypass switch that allows you to operate the system in bypass mode during recovery from such problems as hardware and link failures.

Unless otherwise instructed by Nortel Networks support, leave the card set to normal mode (switch down). The LED is on when the card is in normal mode. See the following illustration for switch locations. The settings are shown in "RSM switch settings" on page 8-10

Note: Hospitality services feature requires the NT4R03AB version of the pack.

RSM switch locations
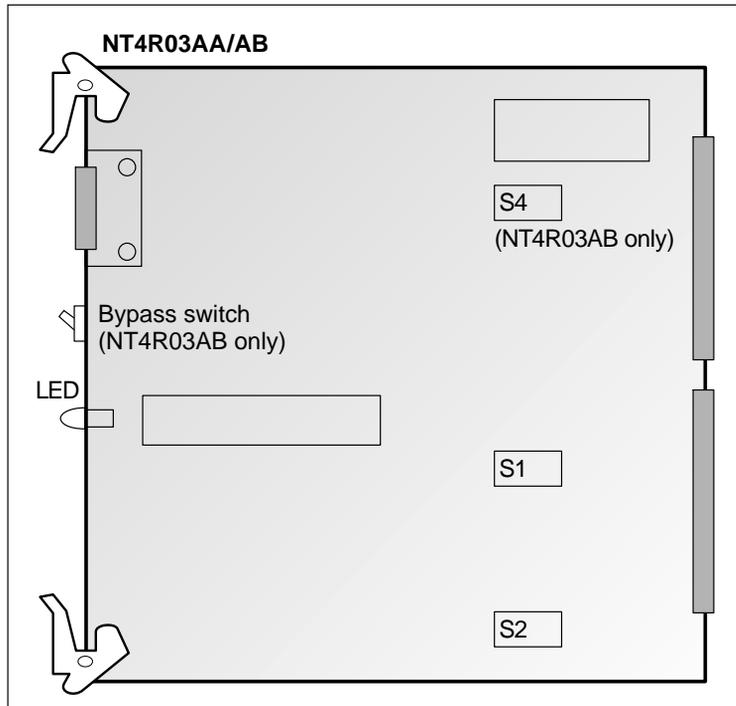
```
┌─────────────────────────────────────────────────┐
│   NT4R03AA/AB                                     │
│                            ┌──────────┐           │
│                            └──────────┘           │
│                            ┌────┐                 │
│                            │ S4 │                 │
│                            └────┘                 │
│                            (NT4R03AB only)        │
│                                                   │
│     Bypass switch                                 │
│     (NT4R03AB only)                               │
│                                                   │
│   LED   ┌───────────────────┐                     │
│         └───────────────────┘ ┌────┐              │
│                               │ S1 │              │
│                               └────┘              │
│                               ┌────┐              │
│                               │ S2 │              │
│                               └────┘              │
│                                          G100146  │
└─────────────────────────────────────────────────┘
```

RSM switch settings

NT4R03AA/AB	NT4R03AA/AB	NT4R03AB only
S1-1 = On	S2-1 = On	S4-1 = On
S1-2 = Off	S2-2 = On	S4-2 = On
S1-3 = Off	S2-3 = On	S4-3 = On
S1-4 = Off	S2-4 = On	S4-4 = On
S1-5 = On	S2-5 = On	S4-5 = On
S1-6 = Off	S2-6 = Off	S4-6 = On
S1-7 = Off	S2-7 = On	S4-7 = On
S1-8 = On	S2-8 = On	S4-8 = On

Network voice processor

Introduction

The network voice processor (NVP) card provides four channels of voice processing. These functions are provided by two digital signal processors (DSPs) and additional logic.

Each Meridian Mail node except node 1 can have a maximum of four NVP cards. The maximum number of NVPs in node 1 depends on the number of nodes in the system. See the following table.

Number of NVPs in node 1

Number of nodes in system	Maximum number of NVPs in node 1
1	3
2	2
3 or more	0

The following figures and tables will help you set the switches on the NVP cards:

- "RSM switch settings" on page 8-10 shows the locations of the switches.

- "NVP switch settings (switches 1 to 4)" on page 8-14 shows the required switch settings for switches S1 to S4.

- The settings for switch S5 are shown at

    - "NVP switch settings for card number (switches 5-1 through 5-4)" on page 8-15

    - "NVP switch settings for shelf and unit (switches 5-5 and 5-6)" on page 8-16

    - "NVP switch settings for loopback" on page 8-16

    - "NVP switch settings for prime NVP in node" on page 8-17

    - "Terminal number, loopback, and prime NVP set by NVP switch 5" on page 8-17

    - "NVP switch settings for loop sharing" on page 8-18

- "Determining NVP switch 5 settings (sample data filled in)" on page 8-19 provides an example for setting switch S5.

- "Determining NVP switch 5 settings (blank form)" on page 8-20 is a blank form that you can use to determine the switch settings for S5.

The three versions of the NVP card differ slightly in configuration and layout. If you want to use loop sharing between nodes, you need version NT4R01AB or NT4R01AC.

NVP switch locations

NT4R01AA

LED

Network cable
connector

S2   S1

S3   S4

S5

NT4R01AB/AC

Note: Switch locations depend on the revision level of the board.
Two versions are illustrated above.
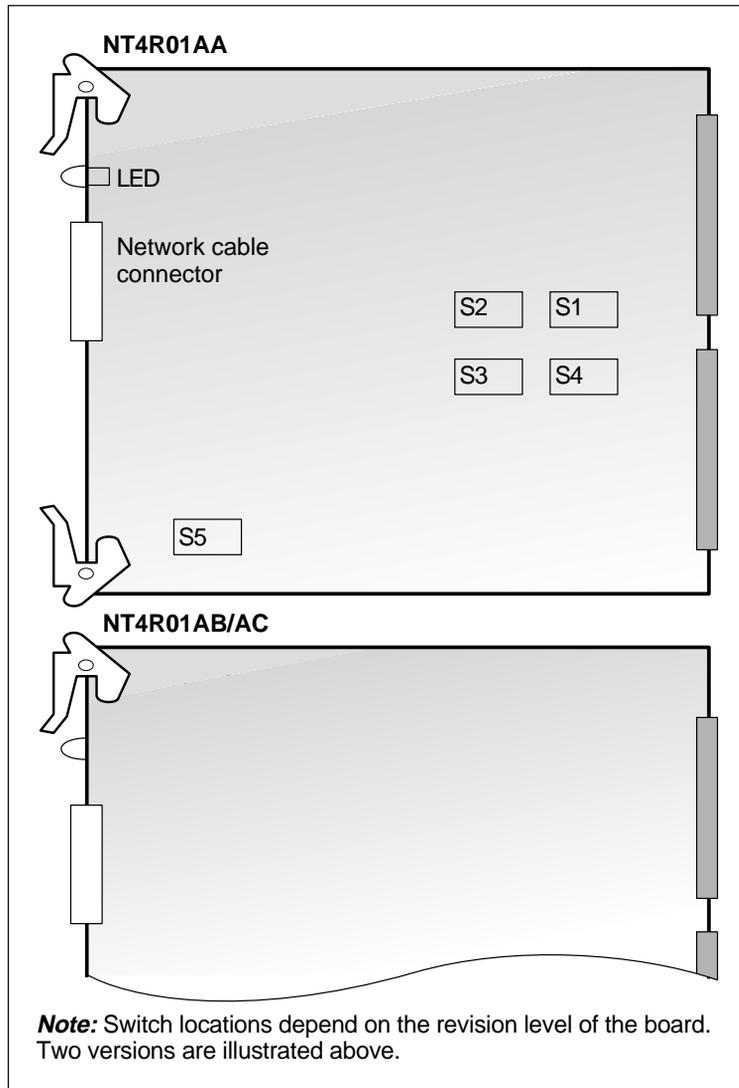
G100161

NVP switch settings (switches 1 to 4)

Switch	NVP 1	NVP 2	NVP 3	NVP 4
S1-1	On	On	On	On
S1-2	On	On	On	On
S1-3	On	On	On	On
S1-4	Off	Off	Off	Off
S2-1	On	On	On	On
S2-2	On	On	On	On
S2-3	On	On	On	On
S2-4	On	On	On	On
S2-5	On	On	On	On
S2-6	On	On	On	Off
S2-7	On	Off	Off	On
S2-8	Off	On	Off	On
S3-1	On	On	On	On
S3-2	Off	Off	Off	Off
S3-3	Off	Off	Off	Off
S3-4	On	On	On	On
S3-5	Off	Off	On	On
S3-6	Off	On	Off	On
S4-1	Off	Off	Off	Off
S4-2	Off	Off	Off	On
S4-3	Off	On	On	Off
S4-4	On	Off	On	Off
S4-5	Off	Off	Off	Off
On = Closed				
Off = Open				
See the next heading for the settings for switch 5.				

Setting the card slot number (S5-1 to S5-4)

The switch settings for S5-1 to S5-4 are based on the card slot number used in the ACD agent TNs programmed on the Meridian 1. For example, if the ACD agent TN is 28 0 3 0, then the card slot number in the TN is 3.

Once you have determined the card slot number used in the TNs for the ACD agents that correspond to this NVP card, refer to "NVP switch settings for card number (switches 5-1 through 5-4)" on page 8-15 for the switch settings for S5-1 to S5-4. Each NVP card can support up to four voice channels. Therefore, the first four ACD agents are associated with the first NVP card in the first Meridian Mail voice node. The second

four ACD agents are associated with the next NVP card, and so on.

NVP switch settings for card number (switches 5-1 through 5-4)

Card slot	S5-1	S5-2	S5-3	S5-4
1	Off	On	On	On
2	On	Off	On	On
3	Off	Off	On	On
4	On	On	Off	On
5	Off	On	Off	On
6	On	Off	Off	On
7	Off	Off	Off	On
8	On	On	On	Off
9	Off	On	On	Off
10	On	Off	On	Off

Setting the shelf and unit number (S5-5 to S5-6)

The shelf number, unit number, and card density programmed for the ACD agent TNs determines the switch settings for S5-5 and S5-6, as shown in "NVP switch settings for shelf and unit (switches 5-5 and 5-6)" on page 8-16. The card density can be single density or double density. The shelf number is the second number in the ACD agent TN, and the unit number is the last number in the ACD agent TN.

For example, if the TNs for the first four ACD agents are 28 0 3 0, 28 0 3 1, 28 0 3 2, and 28 0 3 3, and the switch shelf is programmed for single density, then the switch settings for S5-5 and S5-6 on the first NVP card must be set to "On On."

NVP switch settings for shelf and unit (switches 5-5 and 5-6)

Single-density configuration			
Shelf	Unit	S5-5	S5-6
0	0–3	On	On
1	0–3	Off	On
2	0–3	On	Off
3	0–3	Off	Off

In the single-density configuration, each TN (loop, shelf, card) has four units (from 0 through 3). The NVP card has four voice channels, so each NVP card has its own shelf number.

Double-density configuration			
Shelf	Unit	S5-5	S5-6
0	0–3	On	On
0	4–7	Off	On
1	0–3	On	Off
1	4–7	Off	Off

In the double-density configuration, each TN (loop, shelf, card) has eight units (from 0 through 7). The NVP card has only four voice channels, so two NVP cards can be given the same shelf number but different units.

Loopback (S5-7)   An NVP can be set to loopback for testing, using switch 5-7. For normal use, the card is not set for loopback. See the following table.

NVP switch settings for loopback

Switch	Prime	Secondary
S5–7	Off	On

Prime NVP in node (S5-8)
Only one NVP per node can be designated as the prime, for which NVP1 is recommended (the leftmost NVP card in the node). The NVP is set to prime using switch 5-8. See "NVP switch settings for prime NVP in node" on page 8-17.

NVP switch settings for prime NVP in node

Switch	Prime	Secondary
S5–8	Off	On

Setting the terminal number, loopback, and prime NVP—an example

The following table shows how to set switch 5 for four NVPs in a node, according to the shelf, card, and unit programmed for them in the Meridian 1.

Terminal number, loopback, and prime NVP set by NVP switch 5

	<----Card---->				Shelf and unit		LB	PR
NVP switch 5	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
NVP1 shelf 0, card 6, unit 0-3	1	0	0	1	1	1	1	0
NVP2* shelf 0, card 6, unit 4-7	1	0	0	1	1	1	1	0
NVP3* shelf 0, card 7, unit 0-3	0	0	0	1	1	1	1	1
NVP4* shelf 0, card 7, unit 4-7	0	0	0	1	0	1	1	1

On = closed = 1
Off = open = 0
* Where applicable

Loop sharing (NT4R01AB and NT4R01AC only) (S5-9)

If you are short of loops on your switch, you can reduce the number of loops used by Meridian Mail. Normally, each Meridian Mail node has its own loop. However, because Meridian Mail supports a maximum of 16 channels per node, 8 of the loop's 24 channels are wasted.

For example, two Meridian Mail nodes with three NVPs each (24 channels total) can share a single loop if the NT4R01AB or AC versions of the NVP are used.

Switch 5-9 controls the sharing of a loop with other voice nodes. This only affects the prime NVP card designated through switch 5-8 on each voice node.

When two voice nodes are sharing the loop, switch 5-9 of the prime NVP card on one voice node is set to ON and that of the prime NVP card on the other voice node is set to OFF. For the non-prime NVP cards on both voice nodes, the switch should be ON.

If the node does not share a loop, set switch 5-9 to OFF for all NVPs in the node.

An example of setting loop sharing and prime NVP

See the following table for switch 5-8 and 5-9 settings for loop sharing between nodes 2 and 3 with three NVPs each.

NVP switch settings for loop sharing

Node	NVP	Switch 5-8	Switch 5-9
2	NVP1	Off	On
2	NVP2	On	On
2	NVP3	On	On
3	NVP1	Off	Off
3	NVP2	On	On
3	NVP3	On	On
If loop sharing is not in effect, set switch 5-9 to Off.			

Switch 5-10 setting (NT4R01AB and NT4R01AC only)

Set S5-10 to OFF. Switch 5-10 is reserved for future expansion, and its setting has no impact on the system.

Sample and form for setting switch 5

"Determining NVP switch 5 settings (sample data filled in)" on page 8-19 contains a table that is useful for determining the switch settings for NVP switches 5-1 through 5-10 based on the terminal number and the location of the NVP. The example is for a two-node 20-channel system sharing loop 5.

Determining NVP switch 5 settings (sample data filled in)

Meridian 1 TN				NVP location			Card (see the table on page 8-15)				Shelf/ unit (see the table on page 8-16)		Mode (see the tables on pages 8-16, 8-17, and 8-18)			
Loop	Shelf	Card	Unit	Node	NVP	DNs	Switch 5									
							1	2	3	4	5	6	7	8	9	10
5	0	1	0-3	1	NVP1	7000-7003	0	1	1	1	1	1	1	0	0	0
5	0	1	4-7	1	NVP2	7004-7007	0	1	1	1	0	1	1	1	1	0
5	0	2	0-3	2	NVP1	7008-7011	1	0	1	1	1	1	1	0	1	0
5	0	2	4-7	2	NVP2	7012-7015	1	0	1	1	0	1	1	1	1	0
5	0	3	0-3	2	NVP3	7016-7019	0	0	1	1	1	1	1	1	1	0

Determining NVP switch 5 settings (blank form)

| Meridian 1 TN				NVP location			Card (see the table on page 8-15)				Shelf/unit (see the table on page 8-16)		Mode (see the tables on pages 8-16, 8-17, and 8-18)			
Loop	Shelf	Card	Unit	Node	NVP	DNs	Switch 5									
							1	2	3	4	5	6	7	8	9	10

Verifying PCP cabling

Introduction

Cabling from printed circuit packs (PCPs) to the backplane (SCSI card) or rear I/O panel is in place when modules are shipped, but it is sometimes necessary to move or replace cables. Apart from the SCSI cable, cabling runs from the front of the packs through the right-side cable channel (looking from the front) to the rear. You normally need to remove all the cables from the fronts of the PCPs to remove the voice processor cards to check or change switch settings.

This section provides a complete reference to the cabling involved.

The following illustration shows the I/O panel that is at the left of the rear of each module.
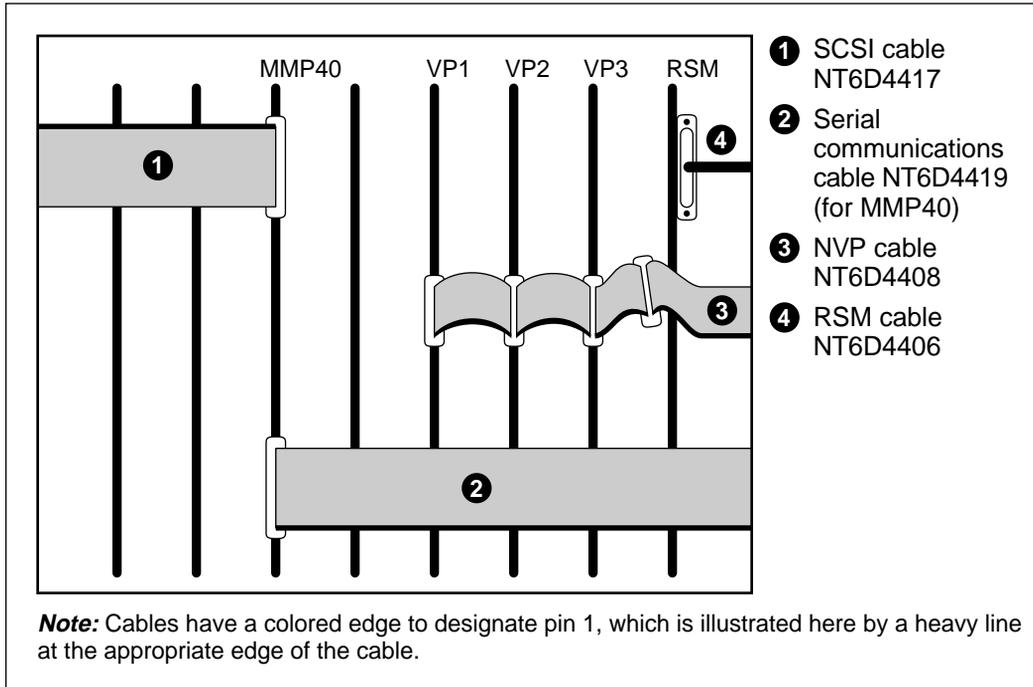
Meridian Mail I/O panel

G100139
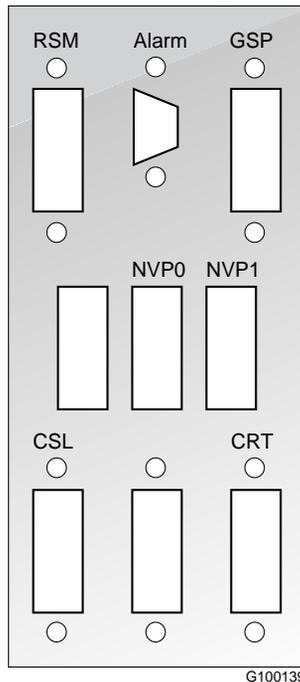
The cables at the circuit packs are illustrated in

- "PCP cables for a single-node system" on page 8-22

- • "PCP cables for a two-node system" on page 8-23
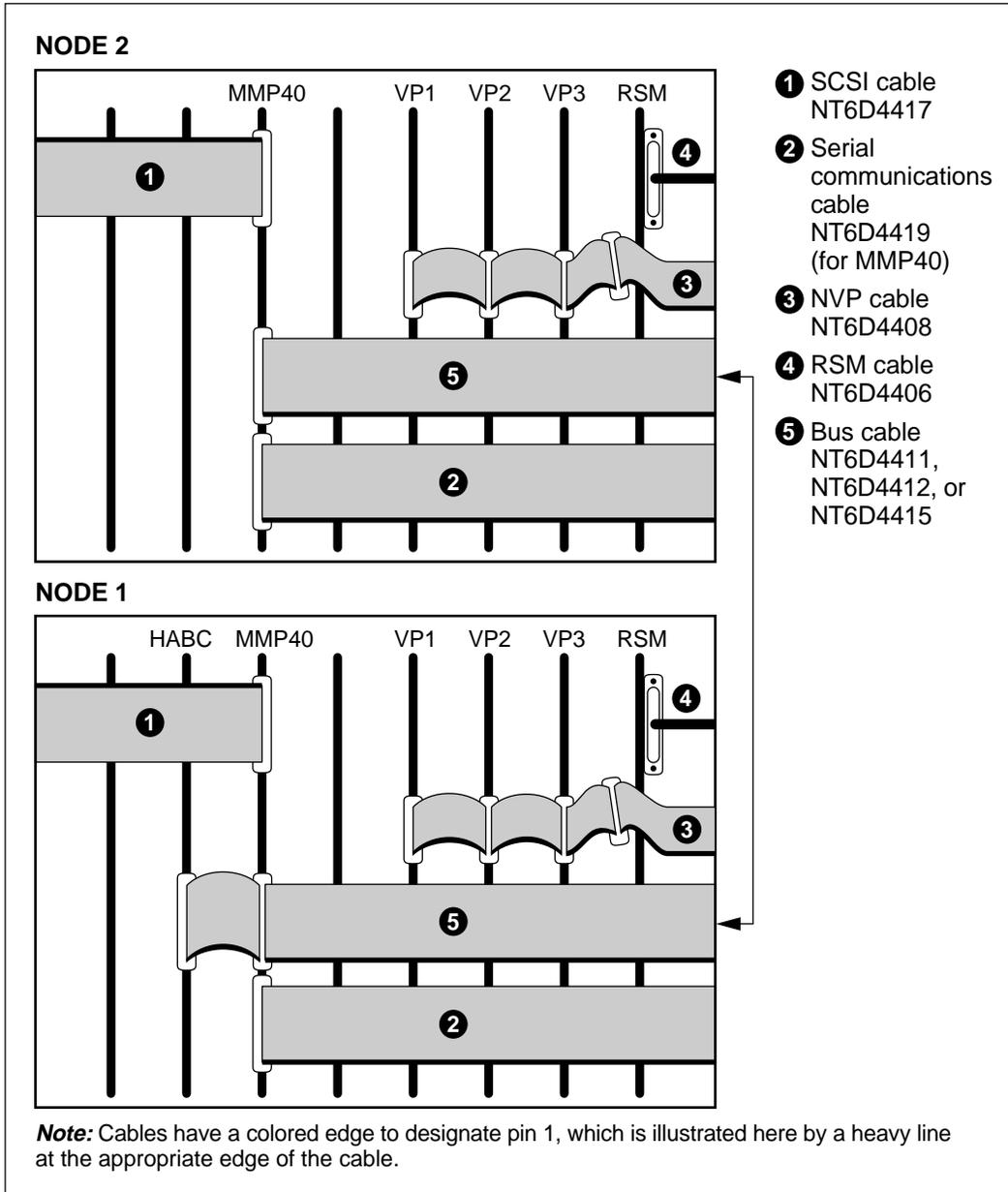- • "PCP cables for a multi-node system" on page 8-24

Cable routing is described on page 8-25.
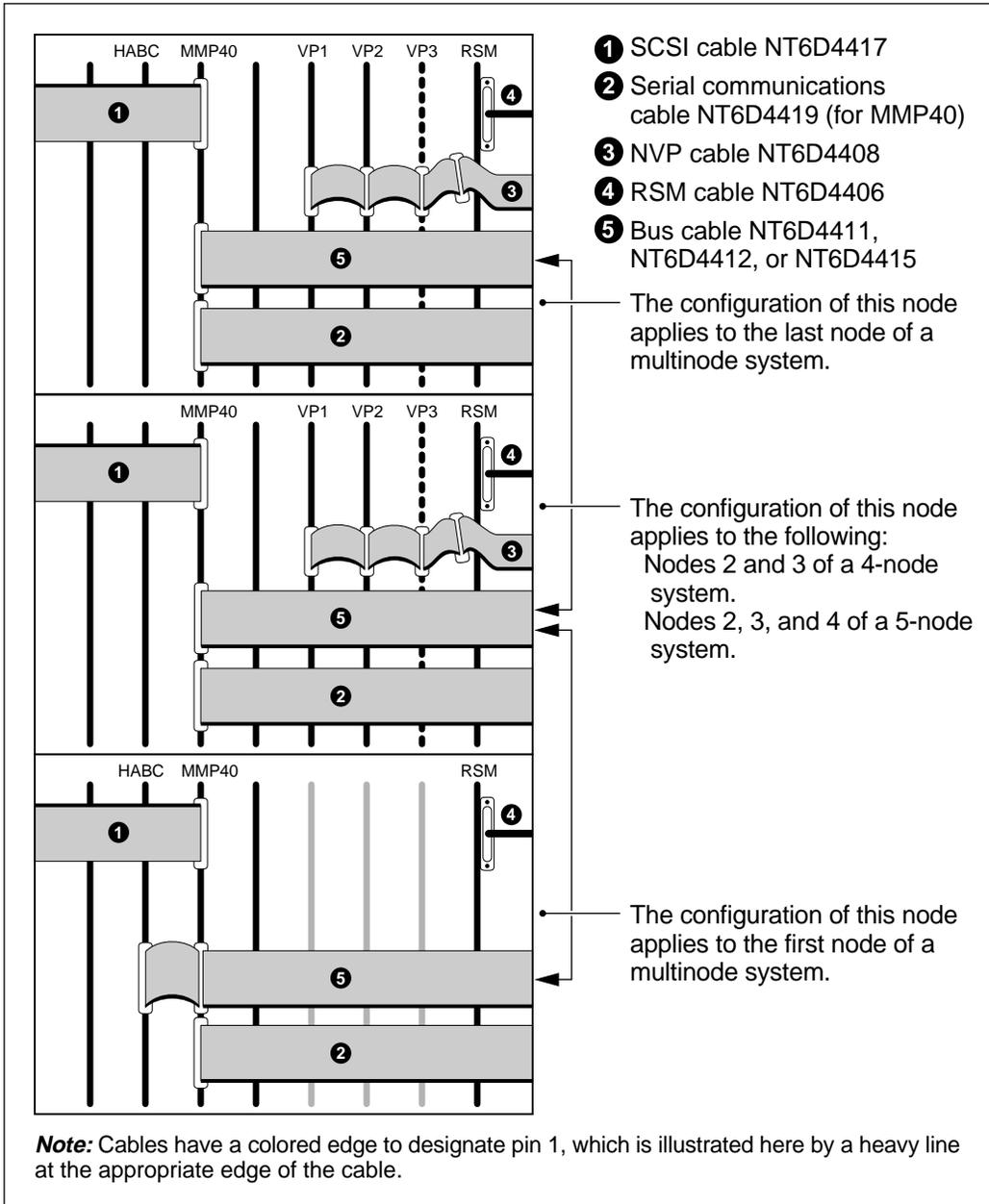
PCP cables for a single-node system


```
                                              ❶  SCSI cable
        MMP40      VP1  VP2  VP3  RSM             NT6D4417
                                              ❷  Serial
                                                 communications
                                                 cable NT6D4419
                                                 (for MMP40)
                                              ❸  NVP cable
                                                 NT6D4408
                                              ❹  RSM cable
                                                 NT6D4406
```

Note: Cables have a colored edge to designate pin 1, which is illustrated here by a heavy line at the appropriate edge of the cable.

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PCP cables for a two-node system

NODE 2

MMP40   VP1   VP2   VP3   RSM

① SCSI cable NT6D4417

② Serial communications cable NT6D4419 (for MMP40)

③ NVP cable NT6D4408

④ RSM cable NT6D4406

⑤ Bus cable NT6D4411, NT6D4412, or NT6D4415

NODE 1

HABC   MMP40   VP1   VP2   VP3   RSM

Note: Cables have a colored edge to designate pin 1, which is illustrated here by a heavy line at the appropriate edge of the cable.

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PCP cables for a multi-node system

❶ SCSI cable NT6D4417

❷ Serial communications cable NT6D4419 (for MMP40)

❸ NVP cable NT6D4408

❹ RSM cable NT6D4406

❺ Bus cable NT6D4411, NT6D4412, or NT6D4415

The configuration of this node applies to the last node of a multinode system.

The configuration of this node applies to the following:
   Nodes 2 and 3 of a 4-node system.
   Nodes 2, 3, and 4 of a 5-node system.

The configuration of this node applies to the first node of a multinode system.

Note: Cables have a colored edge to designate pin 1, which is illustrated here by a heavy line at the appropriate edge of the cable.

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Cable routing

	NT code	**Cable**	**Routing information**
Cable 1	NT6D4417 (A0618621)	SCSI	From the front of the Enhanced MMP40 card to the rear of the shelf, between the Enhanced MMP40 card and the metal plate (a clip is provided to hold the cable in place). Attach to 50-pin connector on the front side of the backplane. ***Note:*** Caution is required when folding and positioning the new SCSI cable. The cable has to be twisted to ensure proper lineup of the pins. Also, ensure the cable is properly folded and positioned away from the edges, as it may become pinched when replacing the metal cover.
Cable 2*	NT6D4419 (A0618623)	Serial communications cable	From the bottom connector at the front of Enhanced MMP40 card to the rear of the shelf, between the RSM card and the metal plate (a clip is provided to hold the cable in place). Route to CSL and CRT connectors on the Meridian Mail I/O panel.
Cable 3	NT6D4408 (A0363747)	NVP	From the front of the NVP cards to the rear of the shelf, between the RSM card and the metal plate (a clip is provided to hold the cable in place). Route to the Meridian Mail connector panel—the end connector to NVP1 and the other connector to NVP0.
Cable 4	NT6D4406 (A0363813)	RSM	From the front of the RSM card to the rear of the shelf, between the RSM card and the metal plate (a clip is provided to hold the cable in place). Route to the RSM port on the Meridian Mail connector panel.
Cable 5	NT6D441*n* where *n* is 1, 2 or 5 (A0367987) (A0368070) (A0364039)	Bus	Systems with two or more nodes only—from the HABC terminator on node 1 HABC to the middle connector at the front of the Enhanced MMP40 card on node 1. Route between the RSM card and the metal plate, and through an opening on the plate. Route the cable up to the next module, and through a plate opening on node 2. Two-node system: Connect to the Enhanced MMP40 terminator, node 2. Multi-node system: Connect to the middle connector at the front of the Enhanced MMP40 card on node 2 and route (as from node 1 to node 2) to the next node. Continue to each Enhanced MMP40 card until the Enhanced MMP40 terminator is reached on the final node. Daisy-chain the cables as needed.
*The combined AML/CRT cables each have a brown wire on the inside edge that is intentionally not used.			

Chapter 9

Diagnostics

In this chapter

Overview

Introduction   After you have added the new node or nodes to your system,
                          installed power supplies, mass storage units, and printed circuit
                          packs (PCPs), and connected all the PCP cables, you can
                          perform sanity testing on the cabling and new hardware.

Sanity testing

Procedure

To perform diagnostics on each module, follow these steps.

Step	Action
1	With the console terminal connected to node 1, turn the power on at node 1, and observe the output on the terminal and on the Enhanced MMP40 hexadecimal display.
	The hexadecimal display should follow the normal bootup sequence described in Chapter 14. If it does not, follow the troubleshooting procedures in "System fails to boot completely" on page 14-21.
2	For multi-node systems, observe the HABC message displayed early in stage 1 of "Bootup stages" on page 14-6. This message should indicate that an HABC has been detected.
3	Turn the power off at node 1, and check the results of the diagnostics. If the diagnostics failed, refer to Chapter 14.
	For single-node systems, testing is complete. For multi-node systems, continue with step 4.
4	Power up the system and observe the hexadecimal display on the Enhanced MMP40 (or MMP40) cards in the non-prime nodes.
	The displays should advance to .6.
5	Turn the power off at all nodes.
	All testing that can currently be performed is complete. If any node failed the testing, replace the MMP40 card and return to step 4. If the problem is not corrected, refer to the troubleshooting procedures in Chapter 15 to verify the installation.
6	Turn to the section "Performing hardware modification for Options, Modular Option, and Modular Option EC MMP40, and Modular Option EC 68K platforms" in the Hardware modification chapter of the *System Installation and Modification Guide* (NTP 555-7001-215). Go to the step after installing the new hardware.

Note: Depending on the changes made to the system, the following procedure may not test the functionality. For example, if a new node has been added to the system, its ability to communicate with the prime node cannot be tested until the software expansion feature is attempted. This procedure tests

features such as the functionality of the Enhanced MMP40 (or
MMP40) card, the ability of the high availability bus controller
(HABC) (for multi-node systems) to provide bus clocks, and
power supplies.

Chapter 10

Installing the Meridian Mail to PBX interface

In this chapter

Overview

Introduction   The procedures in this chapter describe how to install the
                         hardware that links Meridian Mail to the PBX. The Meridian 1
                         programming needed to support the links is discussed in
                         Chapter 12.

                         Two interfaces are required between Meridian Mail and the
                         Meridian 1:

                         •   one network loop for every 24 or fewer channels
                              (recommended) from Meridian Mail to the Meridian 1

                         •   an AML data link from the Meridian Mail prime node to
                              the Meridian 1

Installing the network loop

Introduction   Meridian Mail can be used with any dedicated Meridian 1
network loop with terminal numbers (TNs) available for
Meridian Mail usage. Each Meridian Mail port requires a TN.
The network voice processor (NVP) packs on your system
accommodate four TNs, so that six NVPs use all of the channels
available on a network loop.

You can connect a separate loop cable from the Meridian 1 to
each node of Meridian Mail that contains one or more NVPs.
However, because a Meridian Mail node can have a maximum
of 16 channels, this arrangement wastes at least 8 of the 24
available channels on a loop.

Multinode systems   For multinode systems, Meridian Mail has a network loop-
sharing capability. With this feature, a single QPC414 network
loop card on the Meridian 1 supports a 48-port Meridian Mail
system, so the Meridian 1 does not need to devote more than
one slot to the voice nodes. The 32-kbyte NVP (NT4R01AC)
version of the voice card is required for this loop-sharing
capability.

Procedures   The following procedures explain how to connect one-, two-
and multi-node Meridian Mail systems to a Meridian 1 switch.

All connections at the Meridian 1 end are made to the J1 (even
loop number) and J2 (odd loop number) connectors of the
QPC414 network card used for Meridian Mail.

The Meridian Mail to Meridian 1 network loop cable is
NT8D73AD/AF/AL/AS (1.9/3.65/6.19/9/14 meters
[76/144/244/360 inches] long).

Network loop cable—with and without loop sharing

Introduction

The terminator referred to in each of the following procedures is the Network Loop Terminator, QPF23A.

Installing PBX interface cabling on a one-node system

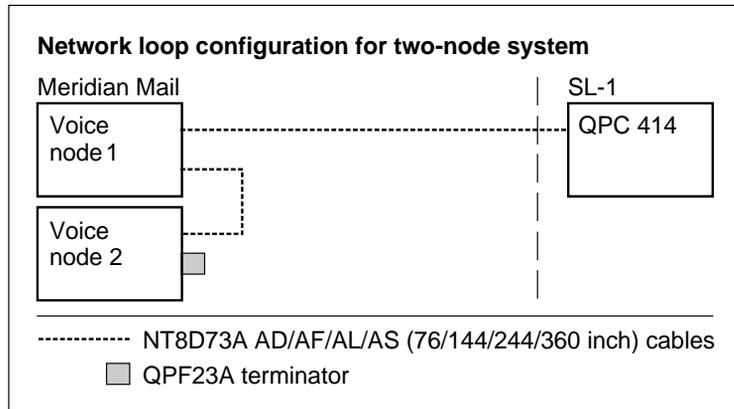To install PBX interface cabling on a one-node system, follow these steps.

Step	Action
1	Connect the loop cable from the Meridian 1 to the NVP1 connector on Meridian Mail.
2	If Meridian Mail is the only peripheral device connected to the Network loop interface card, then install a terminator on the NVP0 connector.

Installing PBX interface cabling on a two-voice node system (with loop sharing)

To install PBX interface cabling on a two-voice node system (with loop sharing), follow these steps.

Note: This procedure supports a maximum of six NVPs between the two nodes.

Step	Action
1	Cable the first node as described above for a single node, but do not install the terminator on NVP0.
2	Attach a second network cable from the NVP0 connector on the first node to the NVP1 connector on the second voice node.
3	Install a terminator on the NVP0 connector on the second voice node. See "Network loop sharing for two voice nodes" on page 10-5.

Network loop sharing for two voice nodes

Network loop configuration for two-node system

Meridian Mail | SL-1

Voice node 1 | QPC 414

Voice node 2

------------ NT8D73A AD/AF/AL/AS (76/144/244/360 inch) cables

▨ QPF23A terminator

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Installing PBX interface cabling on a multi-node system (without loop sharing)

To install PBX interface cabling on a multi-node system (without loop sharing), follow these steps.

Step	Action
1	Connect a loop cable from the Meridian 1 to the NVP1 connector on each Meridian Mail node.
2	Install a terminator on the NVP0 connector on each node on which Meridian Mail is the only peripheral device connected to the Network loop interface card.

Installing PBX interface cabling on a multi-node system (with loop sharing)

To install PBX interface cabling on a multi-node system (with loop sharing), follow these steps.

Note: This procedure supports a maximum of six NVPs between each pair of nodes sharing a loop.

Step	Action
1	Cable the first pair of voice nodes as described above for two voice nodes with loop sharing.
2	Attach a third network cable from the unused (J1 or J2) port of the QPC414 card on the Meridian 1 to the NVP1 port on the third voice node.

Step	Action
3	If the system has three voice nodes, install a terminator on the NVP0 port of the third voice node.
4	If the system has four voice nodes, install a fourth network cable from the NVP0 connector on the third voice node to the NVP1 connector on the fourth voice node. Then, install a terminator on the NVP0 connector on the fourth voice node. See the following figure.

Network loop sharing for four voice nodes

Network loop configuration for five-node system

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Connecting to the Meridian 1 I/O panel

The preceding procedures assume that you are going to attach the network loop cable directly to the network card on Meridian 1.

To make the connection through the Meridian 1 I/O panel instead, follow these steps.

Step	Action
1	Route the network cable to the I/O panel on the Meridian 1.
2	Install an NT8D86AD cable from the I/O panel to J1 or J2 on the QPC414 network pack.

Installing the AML (ISDN/AP) link

Introduction
The Applications Module Link (AML), also known as the Command and Status Link (CSL), communicates commands and status information between Meridian Mail and the Meridian 1. To install the link, either an ESDI port or MSDL port is required on the Meridian 1.

Before you begin
Before beginning the installation, make sure you have the following equipment:

- for Meridian 1 X11 release 18 or higher software—MSDL card (NT6D80AA) or ESDI card (QPC513, version H or later)
- for Meridian 1 release 18 or lower software—ESDI card (QPC513, version H or later)
- ISDN/AP cable (NTND91AB)

The MSDL or ESDI card is installed in the common equipment (CE) shelf in one of the loop (LP) slots.

The MSDL card has four ports that share one device number. The ESDI has two ports, each of which is assigned a separate device number (range 0–15) in Overlay 17. Refer to the prompt ADAN in "Overlay 17—ESDI and AML configuration (X11 Release 17 or earlier)" on page 12-6. The device number identifies the ESDI port or MSDL card.

Appendix C, "Meridian 1 configuration," discusses how to determine the values you need in order to program the Meridian 1 data link. Refer to Appendix C if you are not familiar with how to determine device numbers.

Installing the multipurpose serial data link
Each multipurpose serial data link (MSDL) card has four ports on the faceplate of the card. Because all four ports on the card are associated with one device number, the MSDL occupies only one of the 16 allowed devices for Meridian 1 (unlike the ESDI, which occupies two). The device number or "DNUM" that allows the Meridian 1 to recognize it is programmed in the Meridian 1 Load 17. This is explained in Appendix C, "Meridian 1 configuration."

Note: Meridian 1 cards are hot-pluggable. However, a card must be disabled in the software before removing it.

Installing the MSDL card

To install the MSDL card, follow these steps.

Step	Action
1	Log on to the Meridian 1.
2	Load Overlay 22 and print out the Configuration Record (refer to "Overlay 22—printing existing Meridian 1 configuration" on page 10-9).
3	Refer to the Configuration Record as you select an available device number (DNUM), Application Module Link (AML) number, and Value Added Server Identifier (VSID). *Note:* The DNUMs are the same as TTYs. To choose an available DNUM, choose any unused TTY in the range 0 to 15. Preferably, select the same number for all three numbers. Write these numbers down, as you will need them when configuring the ports.
4	Unpack and inspect the MSDL card, and check that there are no obvious loose or bent parts.
5	For the port you are going to use for the AML, set the switches on the card in accordance with the guidelines in " MSDL card switch settings" listed below.

MSDL card switch settings

Port	Switch	Switch
Port 0	S4 = OFF	S8 = OFF
Port 1	S3 = OFF	S7 = OFF
Port 2	S2 = OFF	S6 = OFF
Port 3	S1 = OFF	S5 = OFF

Step	Action
6	Set the S9 and S10 switches on the MSDL to the assigned device number (DNUM) you chose in step 3 above. For example, if you chose device number 10, set S9 to1 and S10 to 0.
7	Install the card in the slot you chose for it.

Step	Action
8	Observe the red LED on the MSDL faceplate.
	The LED should flash three times and then stay on continuously until the card is configured and enabled in the software. If the LED does not behave in this way, replace the card.

Overlay 22—printing existing Meridian 1 configuration

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	Configuration data block
	**** or END	Exits the overlay

MSDL switch locations and example of switch settings

Card address select switches (TTY port/DNUM)

Tens   Ones

S9   S10

LED

Port 0

DCE   DTE

ON [S4]   ON [S8]   Setting for an RS-232 interface.
                      DTE/DCE are software configured.

Port 1

DCE   DTE

ON [S3]   ON [S7]   Setting for an RS-422 DTE
                      interface.

Port 2

DCE   DTE

ON [S2]   ON [S6]   Setting for an RS-422 DCE
                      interface.

Port 3

DCE   DTE

ON [S1]   ON [S5]   Setting for an RS-232 interface.
                      DTE/DCE are software configured.

Monitor
port

Note: The switch settings shown here are examples only. You need to set switches only for the port you are going to use.

G100080

Installing the Enhanced Serial Data Interface

Each Enhanced Serial Data Interface (ESDI) card has two ports on the faceplate, J1 and J2, to which you can connect the AML cable. Each port is assigned a device number. J1 is associated with an even-numbered device, and J2 with the next higher odd-numbered device. Each port on the card takes up 1 of the 16 devices allowed for the Meridian 1. The device number is DNUM in the load 17 programming used to establish the software link with Meridian Mail. This is explained in Chapter 12, "Configuring the Meridian 1."

A vintage H ESDI card is required for Meridian Mail Release 9.0 or later software. Be sure to use the correct switch option settings required for this card.

To complete this procedure, you may need to refer to *Circuit Card Installation and Testing* (NTP 553-3001-211).

Note: In *Circuit Card Installation and Testing*, this vintage of card is referred to as a Style B card.

Installing the ESDI card

To install the ESDI card, follow these steps.

Step	Action
1	Log on to the Meridian 1.
2	Load Overlay 22 and print out the Configuration Record. Refer to "Overlay 22—printing existing Meridian 1 configuration" on page 10-9.
3	Refer to the Configuration Record as you select an available Device number (DNUM), Application Module Link (AML) number, and Value Added Server Identifier (VSID). *Note:* The DNUMs are the same as TTYs. To choose an available DNUM, choose any unused TTY in the range 0–15. Preferably, select the same number for all three numbers. Write these numbers down, as you will need them when configuring the ports.
4	Unpack and inspect the ESDI card, and check that there are no obvious loose or bent parts.
5	Set the ESDI faceplate switch to DIS.
6	Set the option jumpers for the port you are going to use on the ESDI card according to "ESDI card jumpers and address switch" on page 10-12.
7	Set the device address switches on the ESDI card according to "QPC513 ESDI card switch settings" on page 10-13. You will use the DNUM in overlay 17.
8	Select a slot in the common equipment module of the Meridian 1, and install the ESDI circuit pack. Refer to *Circuit Card Installation and Testing* (NTP 553-3001-211).
9	Set the ESDI faceplate switch to ENB.

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	Configuration data block
	**** or END	Exits the overlay

ESDI card jumpers and address switch

Note: This figure shows both high and low ports configured for Meridian Mail. The higher port example shows the required setting when Meridian Mail is within 15.24m (50 feet) of the Meridian 1 switch. The lower port example shows the required setting when Meridian Mail is far enough away from the switch that you need to use local data sets or a line driver. You need to configure only the port being used.

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QPC513 ESDI card switch settings

QPC513H or later					
Device address				Synchronous mode	
DNUM	1	2	3	4	
0-1	0	0	0	1	
2-3	0	0	1	1	
4-5	0	1	0	1	
6-7	0	1	1	1	
8-9	1	0	0	1	
10-11	1	0	1	1	
12-13	1	1	0	1	
14-15	1	1	1	1	
1 = switch on, 0 = switch off					

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Installing the AML (ISDN/AP) link cabling

To install the AML (ISDN/AP) cabling, follow these steps.

Step	Action
1	Connect the AML (ISDN/AP) cable as described in either step a or step b below: a. MSDL card: Connect one end of the MSDL cable (NTND27AA or NTND27AB) to the assigned MSDL port (port 0, 1, 2, or 3). Connect the other end to the I/O panel of the Meridian 1. b. ESDI: Connect one end of the ESDI cable (P0695822) to J1 or J2 of the QPC513. Connect the other end to the I/O panel of the Meridian 1.
2	Connect the AML (ISDN/AP) cable (NTND91AA/AB) to the I/O panel of Meridian 1. Connect the other end to the CSL port on the I/O panel of the Meridian Mail prime node.

Cabling between Modular Option and Meridian 1

Note: To minimize EMI, cables should stay within the module. Therefore, avoid the use of alternative, indirect routing through the I/O panel wherever possible.
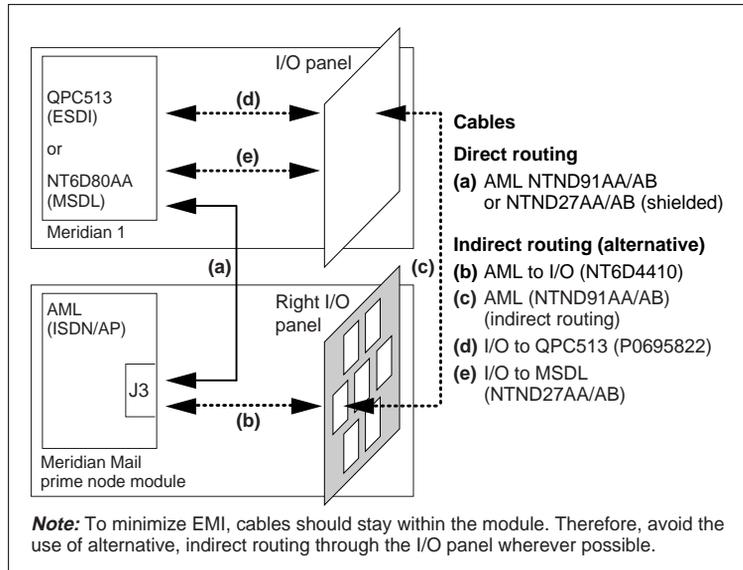
G100061

Chapter 11

Installing and configuring peripheral devices

In this chapter

Meridian Mail peripheral devices

Introduction   Peripheral devices for Meridian Mail include the following:

- administration terminal and printer
- A/B switchbox and local modem (for remote administration)

  Note: To get full support from Nortel Networks, you must install an A/B switchbox and local modem. These devices allow Nortel Networks support personnel to dial in to the system to provide diagnosis and maintenance. Place the facility under the control of an onsite technician. This technician must put the A/B switch in the Remote position to connect the modem to Meridian Mail.

- terminal and remote modem (for remote administration)
- networking modem if required
- guest administration terminals if required

Meridian Mail Reporter   If you are using the Meridian Mail Reporter (formerly AdminPlus) package, many of the procedures in this section do not apply. See the documentation set for Meridian Mail Reporter for installation instructions.

Overview of installation   Install peripheral devices as follows (see "Overview of Meridian Mail peripherals" on page 11-3).

Step	Action
1	Install the A/B switchbox if used.
2	Install the RSM fanout cables.
3	Install and configure the administration terminal.
4	Install and configure the administration printer, and connect it to the administration terminal.
5	Install the local modem if used.

Step	Action
6	Install the remote terminal and modem if used.
7	If you have the hospitality feature, install the guest administration consoles (GACs).
8	Install networking modems if used.

Overview of Meridian Mail peripherals
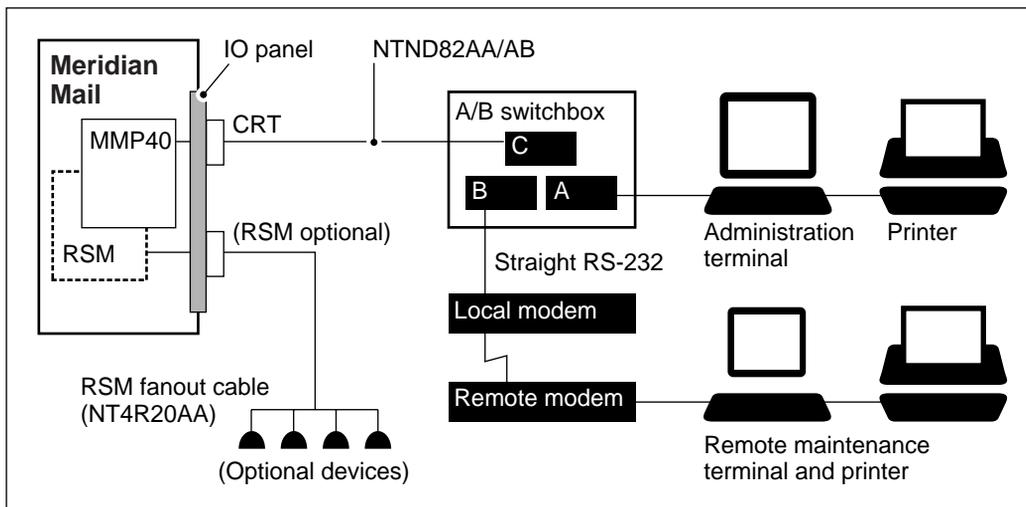
G100164

Installing the A/B switchbox

**Installing the
A/B switchbox**

The A/B switchbox (see below) permits remote administration and maintenance.

To install the A/B switchbox, follow these steps.

Step	Action
1	Place the A/B switchbox in a suitable location near Meridian Mail.
	Note: Although the switchbox may not be exactly as described in this document, the installation is the same. See the instructions provided with the switchbox for specific details.
2	Put the switch on the front of the A/B switchbox to the "A" position.
	a. Label this switch position Local.
	b. Label the other position Remote.

A/B switchbox (rear view)
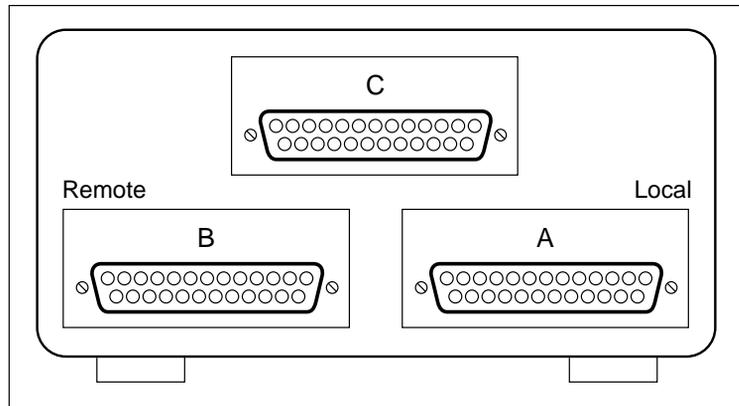
G100060

Installing the RSM fanout cable

Installing the RSM fanout cable

The RSM fanout cable breaks out the four RS-232 data ports on the RSM to separate connectors labeled A, B, C, and D.

To install the RSM fanout cable, follow these steps.

Step	Action
1	Attach an RSM fanout cable to the RSM connector of the I/O panel of each module that contains an RSM.
2	Attach peripheral devices as needed to the connectors A, B, C, and D at the other end of the fanout cable.
3	If necessary, program the RSM ports for the devices you are attaching to them. See *System Administration Tools* (NTP 555-7001-305) for information about programming the ports.

"Data ports and their I/O panel connectors" on page 11-6 shows the recommended data port usage and the correlation between the data port connectors on the I/O panel and the data ports on the RSM and Enhanced MMP40 (or MMP40) packs in the Meridian Mail modules.

In the Connectors column, Module 1 RSM fanout A means the connector labeled A on the RSM fanout cable attached to the I/O panel of module 1. Module 1 I/O panel CRT means the CRT connector on the I/O panel of module 1. The entry in the Port column corresponds to the Port Location on the Hardware Administration—Data Port Configuration screen at the Tools level.

Data ports and their I/O panel connectors

Ports	Connectors	Allowable uses
Node 1 Enhanced MMP40 port 1	Module 1 I/O panel CRT	System Console or AdminPlus
Node 1 Enhanced MMP40 port 2	Module 1 I/O panel CSL	CSL, SMDI
Node 1 RSM port 1	Module 1 RSM fanout A	GAC, network modem, printer, ICL
Node 1 RSM port 2	Module 1 RSM fanout B	GAC, network modem, printer, ICL
Node 1 RSM port 3	Module 1 RSM fanout C	PMSI Link, GAC, network modem, printer, Integrated Communication Link
Node 1 RSM port 4	Module 1 RSM fanout D	PMSI Link, GAC, network modem, printer, Integrated Communication Link
Node 2 Enhanced MMP40 port 1	Module 2 I/O panel CRT	GAC, Printer, Integrated Communication Link
Node 2 Enhanced MMP40 port 2	Module 2 I/O panel CSL	Maintenance, Integrated Communication Link
Node 2 RSM port 1	Module 2 RSM fanout A	GAC, network modem, printer
Node 2 RSM port 2	Module 2 RSM fanout B	GAC, network modem, printer
Node 2 RSM port 3	Module 2 RSM fanout C	GAC, network modem, printer
Node 2 RSM port 4	Module 2 RSM fanout D	GAC, network modem, printer
Node 3 Enhanced MMP40 port 1	Module 3 I/O panel CRT	GAC, Printer, Integrated Communication Link
Node 3 Enhanced MMP40 port 2	Module 3 I/O panel CSL	Maintenance Integrated Communication Link
Node 3 RSM port 1	Module 3 RSM fanout A	GAC, network modem, printer
Node 3 RSM port 2	Module 3 RSM fanout B	GAC, network modem, printer
Node 3 RSM port 3	Module 3 RSM fanout C	GAC, network modem, printer
Node 3 RSM port 4	Module 3 RSM fanout D	GAC, network modem, printer
Node 4 Enhanced MMP40 port 1	Module 4 I/O panel CRT	GAC, Printer, Integrated Communication Link
Node 4 Enhanced MMP40 port 2	Module 4 I/O panel CSL	Maintenance, Integrated Communication Link
Node 4 RSM port 1	Module 4 RSM fanout A	GAC, network modem, printer
Node 4 RSM port 2	Module 4 RSM fanout B	GAC, network modem, printer
Node 4 RSM port 3	Module 4 RSM fanout C	GAC, network modem, printer
Node 4 RSM port 4	Module 4 RSM fanout D	GAC, network modem, printer
Node 5 Enhanced MMP40 port 1	Module 5 I/O panel CRT	GAC, Printer, Integrated Communication Link
Node 5 Enhanced MMP40 port 2	Module 5 I/O panel CSL	Maintenance Integrated Communication Link
Node 5 RSM port 1	Module 5 RSM fanout A	GAC, network modem, printer
Node 5 RSM port 2	Module 5 RSM fanout B	GAC, network modem, printer
Node 5 RSM port 3	Module 5 RSM fanout C	GAC, network modem, printer
Node 5 RSM port 4	Module 5 RSM fanout D	GAC, network modem, printer

Installing the primary administration terminal

Introduction

Every system requires an administrative terminal.

Installing the primary administration terminal

To install the primary administration terminal, follow these steps.

Step	Action
1	Place the administration terminal in a suitable location.
	The administration terminal should be installed within 15.24 m (50 ft.) of the Meridian Mail system. If the distance is greater, asynchronous limited distance modems (LDMs) must be used.
2	Connect the keyboard and power cord to the terminal.
3	Connect one end of a null modem terminal cable (NDND82AA/AB) to the COMM connector on the terminal via an INMAC 328 adapter.
	Depending on the type of terminal, you may also have to use a 6- to 25-pin adapter that is supplied with the terminal.
	Note: The INMAC328 is a DB25F-F gender adapter.
4	If you are not using an A/B switch, connect the other end of the null modem cable to the CRT connector on the Meridian Mail I/O panel.
5	If you are using an A/B switch (see "Overview of Meridian Mail peripherals" on page 11-3), proceed as follows:
	a. Connect the other end of the null modem cable to the connector labeled A on the A/B switch.
	b. Connect one end of a straight RS-232 cable (NTND91AA/AB) to the CRT connector on the Meridian Mail module 1 I/O panel.
	c. Connect the other end of the straight RS-232 cable to the common connector (usually marked C) of the A/B switchbox.
6	Plug the terminal power cord into an AC receptacle.
7	Power on the terminal.
8	Configure the terminal as described in Appendix A for your type of terminal.

Installing and configuring the digital printers

Introduction

The LA75 Plus Companion and LA30^N Companion printers are supported in Meridian Mail.

Install and configure the LA75 Plus Companion or LA30^N Companion printer as described in the procedures that follow.

Note that the cables and adapters needed vary with the type of terminal you are using.

Installing the LA75 Plus Companion or LA30^N Companion printer

To install the LA75 Plus Companion or LA30^N Companion printer, follow these steps.

Step	Action
1	Place the printer in a suitable location near the administration terminal.
2	Connect the power cord to the printer.
3	Connect one end of the BC16E-10 interface cable to the back of the printer. See "LA75 Plus Companion and LA30^N Companion printer connections to administration terminals" on page 11-9.
4	Connect the other end of the interface cable, using adapters and cables as needed, to the terminal. See "LA75 Plus Companion and LA30^N Companion printer connections to administration terminals" on page 11-9 for details on the required cables and adapters.
5	Plug the printer power cord into an AC receptacle.
6	Leave the printer powered off to start configuration.
7	Configure the printer using one of • "Configuring the LA75 Plus Companion printer" on page 11-10 • "Configuring the LA30^N Companion printer" on page 11-12.

LA75 Plus Companion and LA30^N Companion printer connections to administration terminals
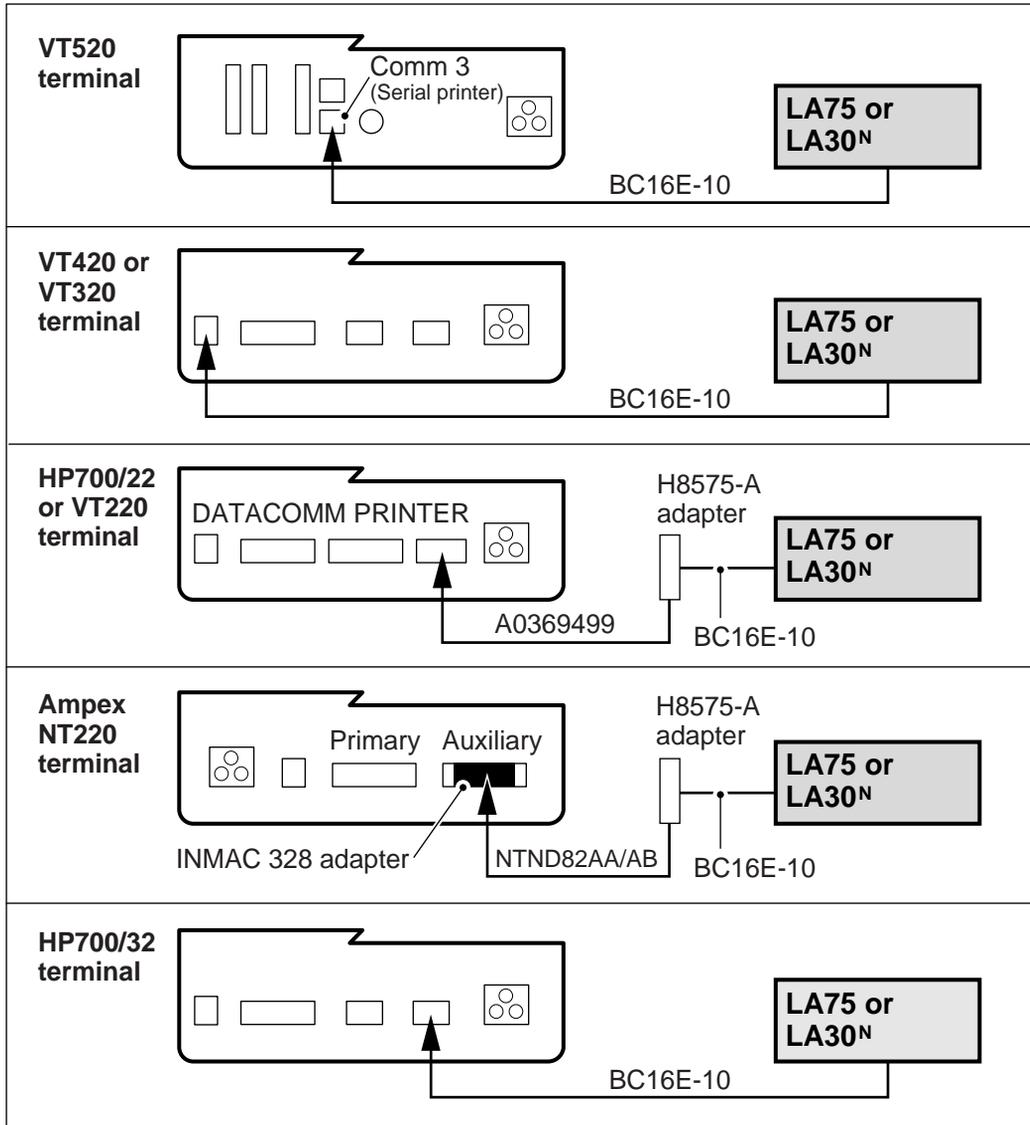
G100619

Configuring the LA75 Plus Companion printer

To configure the LA75 Plus Companion printer, follow these steps.

Step	Action
1	Verify that the printer is turned off.
2	Press and hold the Set-up button on the front control panel of the printer, and, *at the same time*, power on the printer.
3	Release the Set-up button one to two seconds after powering on. See "LA75 printer default settings" on page 11-11 for the layout of the front panel.

Front control panel on LA75 Plus Companion printer
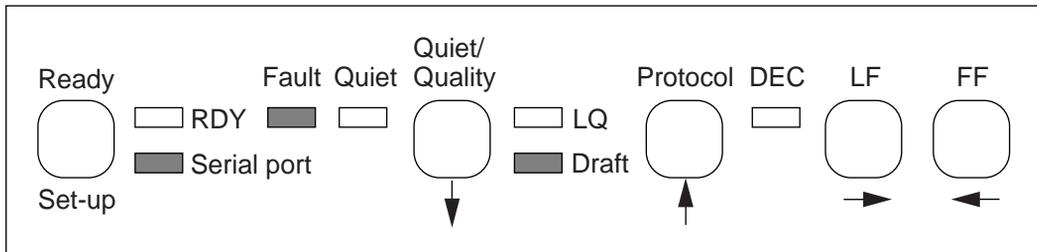
G100076

Step	Action
	The printer automatically prints a list of the default settings. When the list is complete, the printer goes back to the beginning of the list, reprints the first setting, and stops. (That is, it goes back to Generic 1 and stops.)
4	If you want to change the value of the current setting, press the left arrow key on the front of the printer. See "LA75 printer default settings" on page 11-11 for the required values.
	The current feature number is printed again with the new value.
5	If this is not the value you require, press the left arrow key again. The next value for that feature number prints. Refer to the user manual that is provided with the printer for the list of values available for each feature.

Step	Action
6	Repeat step 5 until the value that you want for this feature is printed. Press the Down arrow key to move on to the next feature.
7	Repeat step 5 and step 6 until you have selected the required values for all of the features.
8	Press the Set-up button on the front of the printer to save the settings.

LA75 printer default settings

Feature number	Name	Required value	Meaning
Generic 1	Protocol at power-up	3	Port dependent
Generic 2	Form length	9	27.9 cm (11) inches (A)
Generic 3	Vertical pitch	4	6 lines per 2.54 cm (inch)
Generic 4	Automatic advance	1	Selected
Generic 5	Print quality control	1	Software control
Generic 6	Port selection	1	Serial port
Generic 7	Baud rate	7	9600
Generic 8	Data bits and parity	7	8-None
Generic 9	Buffer control	1	XON/XOFF
Generic 10	Error beep	1	One beep
Generic 11	Typestyle	1	Internal
Generic 12	Input buffer size	1	8K
Generic 13	Disconnect on fault	1	Not selected
DEC 1	Horizontal pitch	7	10 char. per 2.54 cm (in.) (80 col)
DEC 2	GO character pitch	1	U.S. ASCII
DEC 3	User pref. char set	1	DEC Supplemental
DEC 4	Printer ID	4	Conf. Level 2 (LA75 Plus)
DEC 5	Text mode right marg.	2	Wrap

Configuring the LA30^N Companion printer

The LA30^N Companion printer is shipped with default settings that are ready to be used with terminals configured according to Appendix A of this manual.

To configure the LA30^N Companion printer if the factory defaults have been changed, follow these steps.

Step	Action
1	Ensure the configurations of the administration terminal are set as follows: Speed=9600 Receive=Transmit Databit=8 bits Parity=None Stop=1 stop bit
2	Ensure that the continuous forms paper set on the tractors is loaded and that the paper select lever is set backward.
3	Turn off the printer.
4	Turn on the printer while holding the Set-Up/Quit button until the printer beeps. See " Control panel on LA30^N Companion printer" on page 11-13 for the layout of the front panel.
5	Remove the acoustic cover to see the printed text. When the printer enters Set-up mode, it prints a header menu, help menu, and <Functions> menu, and the M1 and M2 indicators flash alternately. The header menu tells you that the printer is in Set-up mode. The help menu provides a quick summary of how to use the buttons in Set-up mode. The <Functions> menu lists all of the available functions in this mode. Refer to "Functions available in Set-up mode" on page 11-13 for a listing of available functions.
6	To recall (or reset) the factory settings, select the RCALL-FACT function and press the down or the up button. Options under the MACRO, INSTALL, and ADJUST functions are all initialized to the factory settings. See "LA30^N printer default settings" on page 11-14 for a list of the factory settings.

Step	Action
7	To exit Set-up mode with the settings saved, select the SAVE&EXIT function and press the down button or the up button.
	Any new settings changed while in Set-up mode are saved as the new power-on defaults for the printer.

Control panel on LA30^N Companion printer
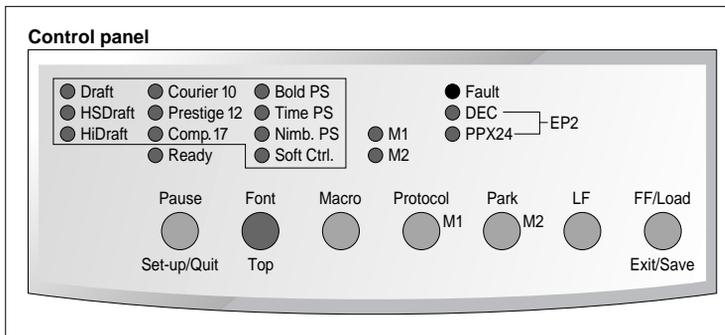
G100620

Functions available in Set-up mode

Function	Description
MACRO 1 and MACRO 2	Assigns print features to MACRO 1 and MACRO 2
PRINT	Prints a list of all currently selected options
INSTALL	Changes the Set-up menu language, computer interface, and paper feed control options
ADJUST	Changes the top-of-form find adjustment options
TESTS	Runs the printing test and hex dumps
RCALL-FACT	Resets factory settings in MACRO 1 and MACRO 2
MENU-Integrated Communication Link	Restricts access to Set-up functions from the control panel
SAVE&EXIT	Exits the Set-up mode and saves any changes made while in Set-up mode

LA30^N printer default settings

Print feature	Factory setting
Protocol	Port dependent
Protocol serial	DEC
Port parallel	EPSON
Font	Draft
Horizontal pitch	10 cpi
Vertical pitch	6 lpi
Form length	27.9 cm (11 inches) (A)
Left margin	1 column
Top of form*	0/60 2.54 cm (inch)
Top margin	1 line
Bottom margin	66 lines
Line mode	LF=LF, CR=CR
Paper source¤	Tractor
Print direction	Soft control
DEC mode	
DEC printer ID	PPL2
Auto wrap	Wrap
EOT disconnect	No disconnect on EOT
Initial report	No
Auto answerback	No
Answerback on ENQ	No
DEC GO character set	U.S. ASCII
DEC user preference character set	DEC Supplemental
IBM and Epson mode	
Default character set	CP 437
IBM mode	
IBM set 1 or 2	IBM set 1
IBM double height	No
IBM AGM	No
Epson mode	
Epson national character set	USA

* When you change the Macro selection and get a new top-of-form value, paper is automatically fed to the next page, using the new top-of-form value.

¤ When you change the Macro selection and the paper source selection is different, the printer automatically parts the continuous forms (in Push-Feed mode only) or ejects the cut sheet. The Fault indicator blinks, indicating you should change the position of the paper select lever.

Installing the HP Thinkjet printer

To install the HP Thinkjet printer, follow these steps.

Step	Action
1	Place the printer in a suitable location near the administration terminal.
2	Connect the power cord to the printer.
3	Connect one end of the appropriate cable to the back of the printer. See "HP Thinkjet printer connections to administration terminals" on page 11-16.
4	Connect the other end of the cable, using an adapter if needed, to the terminal. See "HP Thinkjet printer connections to administration terminals" on page 11-16 for details of the required cables and adapters.
5	Set the printer switches as shown in "HP Thinkjet printer mode switch settings" on page 11-17 and "Printer RS-232 switch settings" on page 11-17. "HP Thinkjet printer switch locations" on page 11-17 shows the location of the switches.
6	Plug the printer power cord into an AC receptacle.
7	Power on the printer.

HP Thinkjet printer connections to administration terminals

G101115

Installing and configuring the digital printers
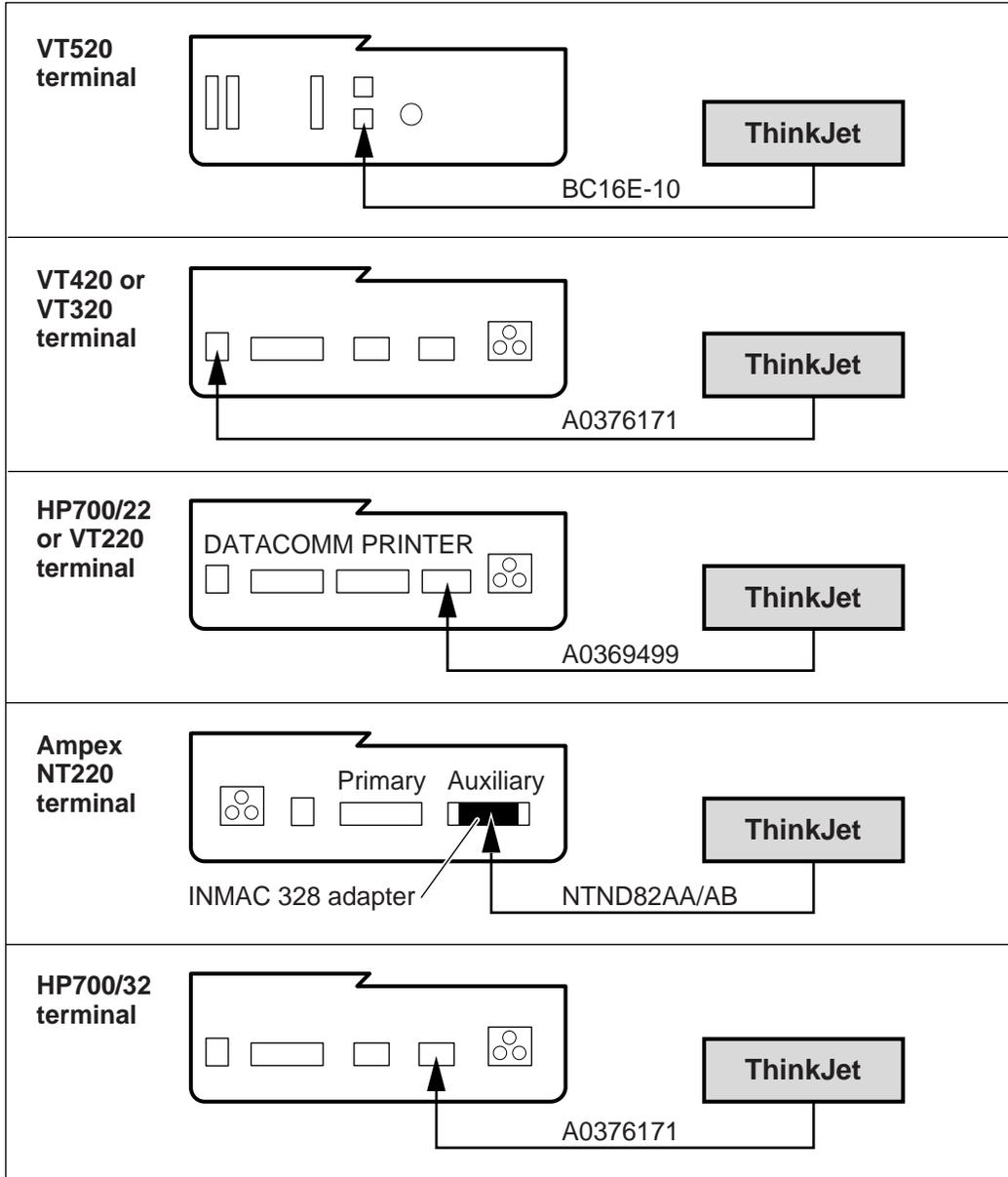
HP Thinkjet printer switch locations
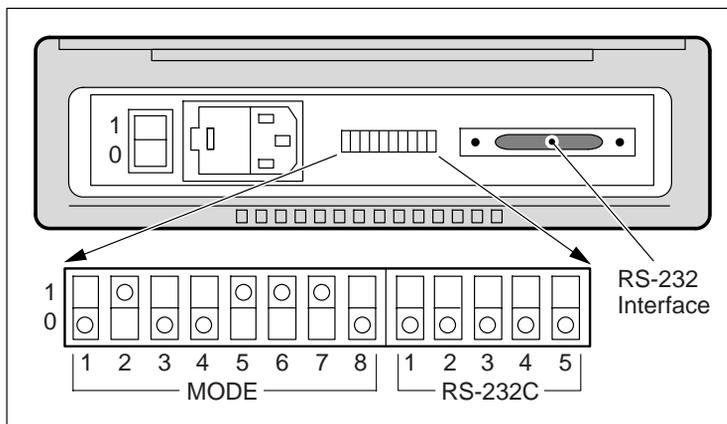
G100079

HP Thinkjet printer mode switch settings

Switch	Position	Function
1	DOWN	CR definition
2	UP	LF definition
3	DOWN	Perforation skip mode
4	DOWN	Page length
5	UP	Control sequence mode
6	UP	Character set
7	UP	Character set, for IBM 8-character set
8	DOWN	Character set

Printer RS-232 switch settings

Switch	Position	Function
1	DOWN	Handshaking mode, set for DTR
2	DOWN	Parity, set for none
3	DOWN	Parity
4	DOWN	Baud rate, set for 9600 baud
5	DOWN	Baud rate

Installing and configuring modems for remote administration

Introduction   The modem configuration procedures below are for the AT command method. If you have a UDS 2440 modem, you may prefer to use the front panel method. Refer to Appendix B, "Modem configuration."

Installing the local modem   To install the local modem, follow these steps.

Step	Action
1	Connect one end of a straight-through RS-232 cable (NTND91AA/AB) to the modem connector labeled • RS-232/EIA for Ven-Tel modems • DTE for UDS modems
2	Connect the modem to the phone line designated for remote administration and maintenance.
3	Plug the modem power cord into an AC receptacle.

Configuring the local modem—AT command method   To install the local modem using the AT command method, follow these steps.

Step	Action
1	If the modem is a Ven-Tel, set the internal switches. Refer to Appendix B, "Modem configuration."
2	Power on the modem.
3	Temporarily disconnect the administration terminal from the A/B switchbox.
4	Connect the free end of the modem cable to the terminal for the purpose of configuring the modem.
5	Configure the modem. Refer to Appendix B, "Modem configuration," for configuration procedures for your modem type.
6	Disconnect the administration terminal from the modem cable.

Step	Action
7	Reconnect the administration terminal to the A/B switchbox.
8	Connect the free end of the modem cable to the B connector on the switchbox.
9	Connect the modem to a convenient phone line.

Installing the remote terminal and modem

To install the remote terminal and modem, follow these steps.

Step	Action
1	If the modem is a Ven-Tel, set the internal switches. Refer to Appendix B, "Modem configuration," for configuration procedures for your modem type.
2	Place the terminal and the modem in a suitable location.
3	Connect the keyboard and power cord to the terminal, and the power cord to the modem.
4	Connect one end of a straight-through RS-232 cable to the COMM connector on the terminal via an INMAC 328 adapter. Depending on the type of terminal, you may also have to use a 6- to 25-pin adapter that is supplied with the terminal.
5	Connect the other end of the straight-through RS-232 cable to the modem.
6	Plug the terminal and modem power cords into an AC receptacle.
7	Power on the terminal and modem.
8	Configure the terminal as described in Appendix A for your terminal.
9	If you did not already configure the modem, do so now. Refer to Appendix B for configuration procedures for your modem type.

Configuring the remote modem using the administration terminal (optional)

You can configure the remote modem using the administration terminal, or wait until you have installed and configured the remote terminal before configuring the remote modem.

To configure the remote modem using the administration terminal, follow these steps.

Step	Action
1	If the modem is a Ven-Tel, set the internal switches. Refer to Appendix B, "Modem configuration."
2	Connect one end of a straight-through RS-232 cable (NTND91AA/AB) to the modem connector labeled • RS-232/EIA for Ven-Tel modems • DTE for UDS modems
3	Plug the modem power cord into an AC receptacle.
4	Power on the modem.
5	Temporarily disconnect the administration terminal from the A/B switchbox.
6	Connect the free end of the modem cable to the terminal for the purpose of configuring the modem.
7	Configure the modem. Refer to Appendix B for configuration procedures for your modem type.
8	Disconnect the administration terminal from the modem cable.
9	Reconnect the administration terminal to the A/B switchbox.

Guest Administration Console

Introduction

A Guest Administration Console (GAC) is used by hotel staff to administer guest mailboxes. Up to four GACs can be installed on a Meridian Mail system with the Guest Voice Messaging option.

Note: If the cable distance between Meridian Mail and the terminal is greater than 15.24 m (50 ft), line drivers (short haul modems) are required. Ensure that the signaling between line drivers is set up correctly. Ensure that you have the appropriate RS-232 cabling (straight-through for DCE/DTE, and null modem for DCE/DCE or DTE/DTE).

Each GAC can have an optional display-only console attached to the printer port. The display-only console is required only if the Property Management System (PMS) is not equipped to provide voice message waiting indication at checkout time. See below.

PMS installation with GAC terminals
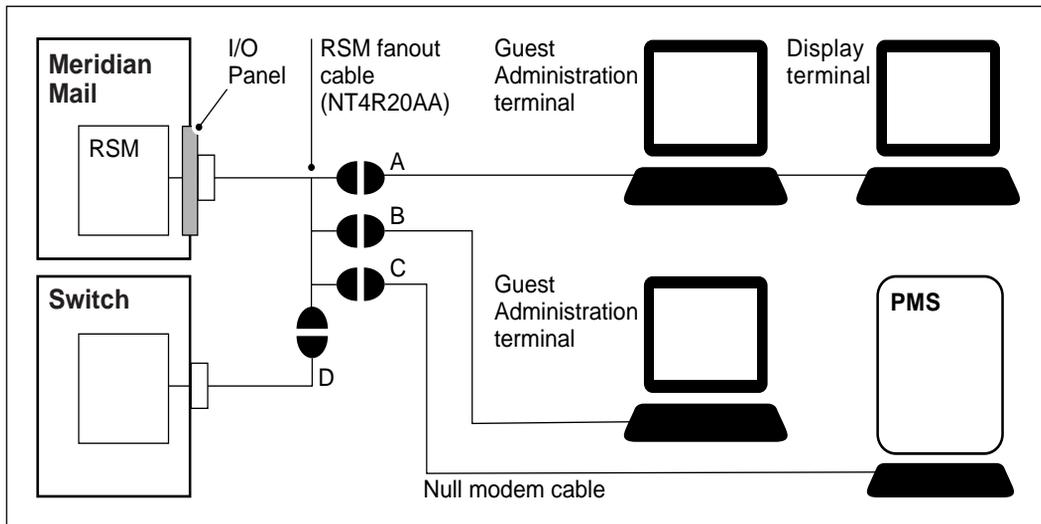
G100165

Note: To use GACs, you must have the hospitality feature installed, and the RSM pack used must be the NT4R03AB version.

Installing a Guest Administration Console

To install a GAC, follow these steps.

Step	Action
1	Connect one end of a null modem cable from the terminal to a connector on an RSM fanout cable connected to the Meridian Mail I/O panel, or to a CRT connector on a Meridian Mail I/O panel.
	This connector must correspond to a port that has been configured for a GAC.
2	Connect the other end to the Comm connection on the GAC.
3	If a display-only console is used on the system, connect one end of a straight-through RS-232 cable to the printer port of the GAC.
4	Connect the other end to the Comm port on the display-only console.
5	Configure the terminal as described in Appendix A.
	Note: A port should have been configured at software installation time for each GAC. If this was not done, you need to reconfigure the ports from the administration terminal. Go to the System Administration Tools level on the MMI screen and select Configure GACs. See *System Administration Tools* (NTP 555-7001-305).

Installing a networking modem

To install a networking modem, follow these steps.

Step	Action
1	Connect one end of a straight RS-232 cable (NTND91AA) to a connector on an RSM fanout cable attached to the Meridian Mail I/O panel.
	This connector must correspond to a port that has been configured for a networking modem. "Data ports and their I/O panel connectors" on page 11-6 shows the fanout cable connectors, the corresponding ports configured during system installation or modification, and the recommended data port usage. See *System Administration Tools* (NTP 555-7001-305) for information on configuring a data port.
2	Connect the other end of the cable to the RS-232/EIA connector on the modem.
3	Configure the modem as described in the chapter "Installing the hardware" in the appropriate *Networking Installation and Administration Guide* (NTP555-7001-24x) for your type of networking (AMIS, Meridian, Enterprise Network Message Service, Virtual Node AMIS). This chapter also describes how to configure the appropriate port if it was not configured at software installation time.

Optional peripheral devices

RSM card and cabling installation

The RS-232 service module (RSM) provides four RS-232 ports and alarm capabilities. "RSM cabling overview" shown below, illustrates the cabling involved in these functions. The following table lists the alarm port and ground cable connections.

RSM alarm, ground, and power monitor connections

Description	J2 pin
Frame ground	1
Ground	2
Power monitor	6
Minor alarm, normally closed	7
Minor alarm, normally open	3
Minor alarm, common	8
Major alarm, normally closed	9
Major alarm, normally open	4
Major alarm, common	5

RSM cabling overview
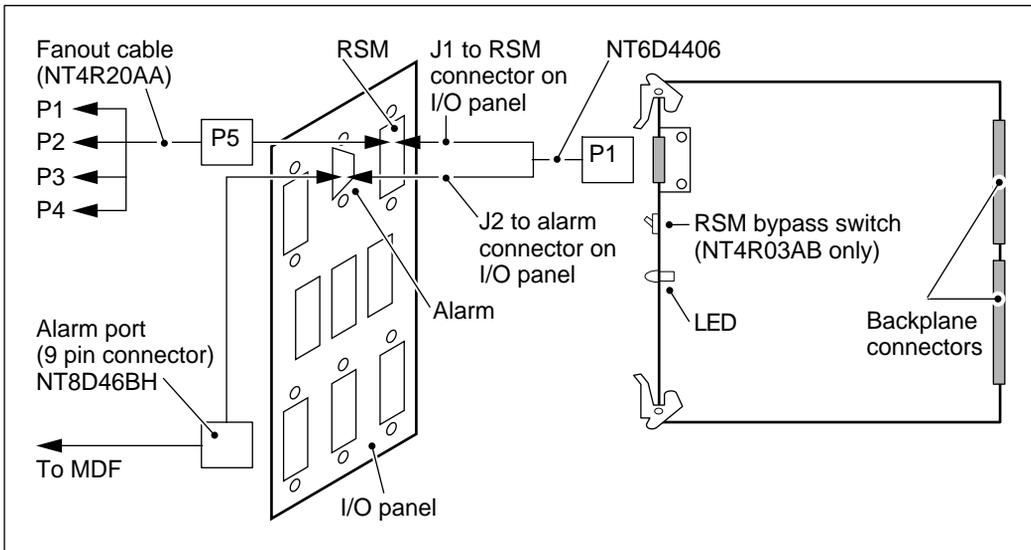
G100163

Alarms

Introduction

Two Form-C dry contact relays are provided for connection to customer-provided alarms. Each relay contact is rated at 0.5 amperes and 150 V DC.

Critical, major, and minor alarms

Alarms that show as critical or major on your administration terminal appear in the central office as minor. Alarms that show as minor on your administration terminal do not appear in the central office (see the following table). These alarms are corrected by following the instructions in the SEER reports.

Software and hardware alarm status

Software alarm	translates into hardware alarm
Critical	Minor
Major	Minor
Minor	Not supported by Meridian Mail software

The critical and major alarm contacts can be triggered by the processor, a board reset, a power-off condition, or watchdog time-out (which has a fixed 128-second time-out interval).

Note: The major alarm to indicate system down status is available only from the RSM card installed on the prime node (node 1).

Connecting the alarm

To connect the alarm, follow this step.

Step	Action
1	Connect the power monitor alarm cable (NT8D46BH) from the RSM J2 connector on the Meridian Mail I/O panel to the main distribution frame (MDF). Refer to "RSM cabling overview" on page 11-24 and "I/O panel" on page 11-26. The pin assignments are detailed in "RSM alarm, ground, and power monitor connections" on page 11-24.

I/O panel
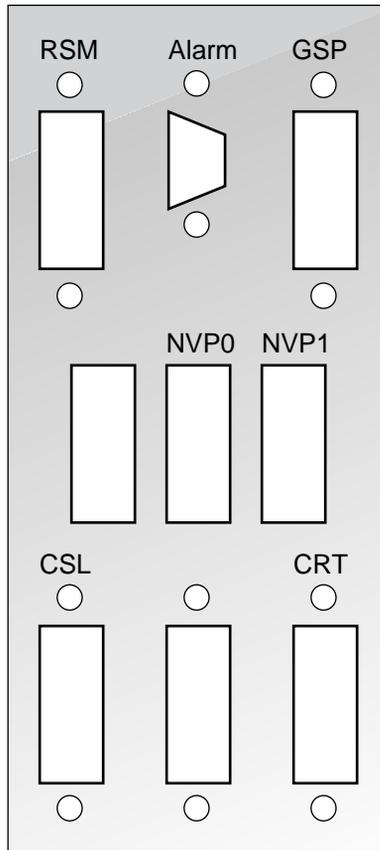
G100139

Installing a new RSM card and cabling

Introduction

If you need more RS-232 ports than are available on your present system, you can install a new RSM card either in an open VP/RSM slot or by replacing a VP in a VP/RSM slot.

Installing the RSM card and cabling

To install the RSM card and cabling, follow these steps.

Step	Action
1	Power down the system.
2	Remove the front and rear covers from the module in which the RSM is to be installed.
3	Disconnect the cabling at the front of the Enhanced MMP40 (or MMP40) card.
4	Disconnect the cabling at the front of the NVP cards.
5	Remove the NVP cards, label them for the VP/GSP slots 1 to 3 or VP/RSM slot, and carefully put them aside.
6	Route the RSM cable (NT6D4406) along the inner panel (just to the right of the RSM card slot) to the rear of the shelf. (Clamps are provided to secure the cable along the panel.)
7	Go to the rear of the module and inspect the connector panel. If the Alarm slot is the same size as the RSM slot and you are installing the alarm cable, go to step 9. If the Alarm slot is smaller than the RSM card, go to step 8.
8	If you have the older-style connector panel, install the adapter plate over the Alarm slot. Short screws are provided to secure the plate at the top and bottom.
9	Mount the J1 connector onto the port marked RSM. Secure the bail locks onto the connector. See "RSM cable to connector panel" on page 11-28.
10	Optional step: Mount the J2 connector onto the port marked Alarm. Secure the connector with long screws.
11	Connect the RSM fanout cable (NT4R20AA) to the RSM connector, and route it to the RS-232 devices you require.
12	Install the RSM card in the appropriate slot.
13	Connect the RSM cable to the front of the RSM card.

Step	Action
14	Reinstall the NVP cards and reconnect the cabling at the front of the cards.
15	Reconnect the cables to the front of the Enhanced MMP40 (or MMP40) card.
16	Inspect all cables and cards to ensure that they are seated properly.
17	Reinstall the front and rear covers.
18	Power up the system.
19	See *System Installation and Modification Guide* (NTP 555-7001-215) for hardware modification to add the RSM card to the hardware database.
20	See the *System Administration Tools* (NTP 555-7001-305) to assign data ports using Modify Hardware from the Tools Utility Menu.

RSM cable to connector panel
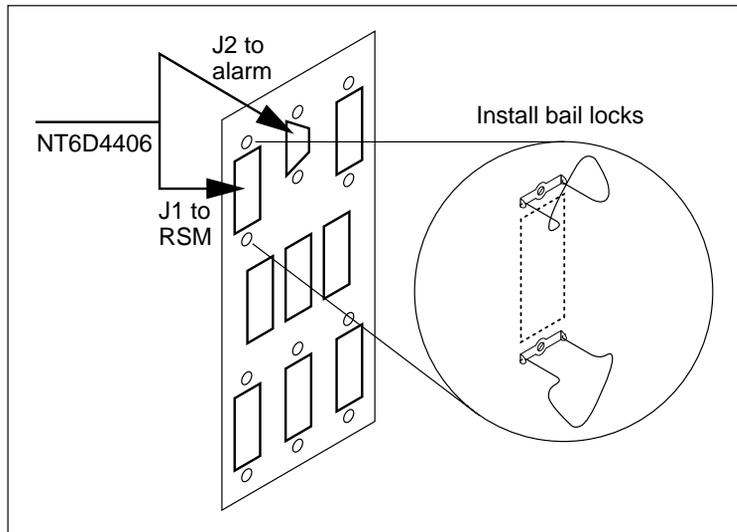
G100168

Chapter 12

Configuring the Meridian 1

In this chapter

Overview

Introduction

This section describes the Meridian 1/SL-1 configuration procedures necessary for the Meridian Mail service. The following procedures are discussed:

- replacing the CPU ROM daughterboard on a single-CPU and on a dual-CPU Meridian 1
- configuring the route data block
- defining the primary Meridian Mail ACD queues and voice services ACD queues
- programming and verifying the network loop
- adding ACD agents
- enabling ESDI ports
- activating the AML link
- saving changes to the Meridian 1 configuration

Note: For the most part, from a Meridian Mail perspective, the Meridian 1 and SL-1 switches are the same. For economy, only the term Meridian 1 will be used when referring to these switches. However, all reference documents will refer only to the SL-1.

Before you begin

Before you begin, ensure that the appropriate software and hardware conditions are met on the Meridian 1 before installing Meridian Mail. See the *Site and Installation Planning Guide* (NTP 555-7041-200) for details.

In order to perform the following procedures successfully, have the following documentation on hand:

- *X11 Input/Output guide* (NTP 553-3001-400)
- *Circuit Pack Option Settings (*NTP 553-2201-211)
- *Circuit Card Installation and Testing (*NTP 553-3001-211)

Note: It is assumed that you are logged on to the Meridian 1 before you load any of the overlays.

Responding to prompts

In tables showing your responses to prompts from Meridian 1 overlays, only the prompts you need to respond to are shown. If

you see a prompt that is not in the table, press <Return> until you see the next prompt that is in the table.

After the last prompt shown in the table, press <Return> until the first prompt appears again before exiting the overlay. If you do not do so, the information you entered will be discarded when you exit the overlay.

Enter ******** or **END** followed by <Return> to exit an overlay.

Checking and replacing the CPU ROM daughterboard

Introduction   To check the current ROM, load Overlay 22 and enter **ROM** in response to the prompt REQ. Check the required ROM in the following table:

Required ROM

Configuration	ROM
Meridian 1/SL-1 ST (Release 12–14)	QPC717
Meridian 1/SL-1 ST (Release 15 or later)	QPC940
Meridian 1/SL-1 N	QPC782
Meridian 1/SL-1 LE	QPC573
Meridian 1/SL-1 XL	QPC599
Meridian 1/SL-1 XN	QPC600
Meridian 1/SL-1 XN (Memory Enhanced)	QPC601
Meridian 1/SL-1 RT/NT/XT	QPC602
Meridian 1/SL-1 MS	QPC662
System 21/21A	QPC940
System 51/61/71	QPC939

If the ROM must be replaced, follow the procedure described in this section for single or dual CPUs.

	CAUTION
	Risk of equipment damage Do not touch the other components on the CPU pack. During removal and insertion, carefully line up the pins and connector of the new daughterboard with the pins and connector on the CPU.

Replacing the CPU ROM daughterboard on a single-CPU Meridian 1

Service will be interrupted during this procedure since it involves a Meridian 1 system.

To replace the daughterboard, follow these steps.

Step	Action
1	Power down the Meridian 1 system.
2	Remove the CPU card, and replace the daughterboard (located on the component side of the CPU pack).
3	Reinsert the CPU card.
4	Power up the Meridian 1 system.

Replacing the CPU ROM daughterboard on a dual-CPU Meridian 1

Use Overlay 35 to ensure the system is operating on the other CPU. The LED on the CPU card, when lit, indicates a CPU that has been disabled or is not currently in use.

To replace the daughterboard, follow these steps.

Step	Action
1	Place the active CPU in maintenance mode using the faceplate switch.
2	Disable the inactive CPU using the faceplate switch.
3	Remove the inactive CPU card, and replace the daughterboard (located on the component side of the CPU pack) with the correct version.
4	Reinsert the CPU card.
5	Reenable the CPU card using the faceplate switch.
6	Load Overlay 35 and use the **TCPU** command to test the inactive CPU and new ROM. If the response is anything other than OK, refer to the *X11 Input/Output Guide* (NTP 553-3001-400).
7	Take the active CPU out of maintenance mode.
8	Use the SCPU command (Overlay 35) to switch CPUs.
9	Repeat step 1 to step 7 for the second CPU.
10	Exit from Overlay 35 by entering **** and <Return>.

Configuring the ESDI and AML

Introduction

Use Overlay 17 to define the ESDI and AML link on the Meridian 1. ("NMS only" prompts apply to Network Message Service systems.)

- Refer to the table below for link configuration for X11 Release 17 and earlier.
- Refer to "Overlay 17—AML link configuration (Release 18 or later)" on page 12-8 for link configuration for X11 Release 18 or later. Prompts that are relevant only if you are using an MSDL card are identified by the phrase "MSDL only" in the Description column.

Overlay 17—ESDI and AML configuration (X11 Release 17 or earlier)

Prompt	Response	Description
REQ	CHG	
TYPE	CFN	Configuration data block
Note: The prompts in the shaded area below apply to NMS only.		
ISDN	YES	NMS only—To update the AML records
IFC	SL1	NMS only—Interface type is SL-1 (the Meridian 1)
RLS	16	NMS only—Minimum Meridian 1 software release at the far end is 16
IOTB	YES	Make changes to logical units.
ADAN	NEW TTY xx	To add an AML link, where xx is an unused TTY number (0–15) *Note:* Ensure that this number does not conflict with another device number (for example, FDK if you are using Release 15).
	CHG TTY xx	To change an AML link, where xx is the link number (0–15)
	OUT TTY xx	To remove an AML link, where xx is the link number (0–15) *Note:* xx should be the same as the device address number (DNUM) set on the ESDI card.
ESDI	YES	Port is on an ESDI card.

Prompt	Response	Description
SYNC	YES	Synchronous mode is required.
DUPX	FULL	Full duplex is required.
BPS	(4800) 9600	AML data rate—4800 for a 68K system, 9600 for Enhanced MMP40 (or MMP40)
CLOK	EXT	External clocking arrangement
IADR	3	Data link level HDLC protocol individual address (identifies the Meridian 1 at HDLC data link level)
RADR	1	Data link level HDLC protocol remote address (identifies Meridian Mail at the HDLC data link level)
LCTL	YES	Modify the link control parameters.
T1	10	Retransmission timer (range 2–20 is in units of 0.5 s; for example, 3 = 1.5 s)
T2	0	Timer for no frame exchange (range 0–255, in seconds)
T3	40	Timer for initial link setup (range 2–255 is in units of 0.5 s)
N1	128	Maximum number of octets (8-bit bytes) per HDLC information frame (allowed values are 32, 64, [128])
N2	8	Maximum number of retransmissions (allowed values are 4-[8]-16)
K	7	Maximum number of outstanding frames (allowed values are 1- [2]-7)
LTHR	YES	Modify link performance thresholds. Use defaults for all prompts except USER.
USER	CMS	This ESDI port is used for AML.
ADAN	<cr>	Go to the next prompt.
VAS	NEW or CHG	Define the AML configuration.
VSID	xx (range is 0–15)	Server ID (should be the same number as associated AML link number entered for ADAN above)
DLOP	<cr>	Go to the next prompt.
CMS	xx (range is 0–15)	Must be the same number as the ESDI device address (DNUM).
CONF	DIR	Link configuration is DIR.

Prompt	Response	Description
CMS	<cr>	Go to the next prompt.
CSQI	20 *	Max. no. of call registers for the input queues (twice the number of voice ports)
CSQO	20 *	Max. no. of call registers for the output queues (twice the number of voice ports)
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

* The number of call registers assigned in the CSQI and CSQO fields should be twice the number of voice ports. For example, 24 call registers should be assigned for a 12-channel Meridian Mail system.

Overlay 17—AML link configuration (Release 18 or later)

Prompt	Response	Description
REQ	CHG	Change
TYPE	CFN	Configuration data block
PARM	DTE (DCE)	(MSDL only) Interface transmission mode
ADAN	NEW AML xx (range is 0–15)	The response "NEW AML xx" creates an AML with a link number xx. The link number can be any number from 0–15. It should be the same as the device address switch setting (DNUM) on the EDSI or MSDL card.
CTYP	ESDI or MSDL	Card type
DNUM	0–15	Device number for the AML port. (Use the same number that you used for the AML number. This will make it easier to remember both numbers.) (MSDL only) Port number in the range 0–3 for the port you are using for AML.
Port	x	

Prompt	Response	Description
DES	aaa...a	AML port designation. (This can be any alphanumeric string up to 16 characters: 0–9 and A–Z [uppercase only] are allowed. Characters * and # are not allowed.)
BPS	(4800) 9600E	AML data rate—9600
PARM	R232 DC	(MSDL only) Interface and transmission mode
CLOK	EXT	(EDSI only) Internal or external clock (Source of the primary clock can be internal or external.)
IADR	(3)	Individual address for the data link HDLC protocol. (The IADR and RARD prompts must be coordinated with the far end. If IADR is defined as 3, then RARD must be 1. The default is 1 prior to Release 18.)
RARD	(1)	Remote address for the data link HDLC protocol. (The IADR and RADR prompts must be coordinated with the far end. If IADR is defined as 3, then RARD must be 1. Default is 3 prior to Release 18.)
LCTL	YES	Modify link control parameters.
T1	10	Timer of retransmission range in units of 0.5
T2	0	Maximum time allowed without a frame being exchanged
T3	40	Timer for initial link setup in units of 0.5
N1	(128)	Maximum number of octets (8-bit bytes) per HDLC information frame (allowed values are 32, 64, [128].)
N2	(8)	Maximum number of retransmissions in steps of 1
K	(7)	Maximum number of outstanding frames

Prompt	Response	Description
LTHR	NO	(ESDI only) Modify link performance thresholds.
ADAN	<Return>	Press <Return> to access the VAS prompt.
VAS	NEW	Add, change, or remove a value added server.
VSID	0-15	VAS identifier. (To make it easy to remember this number, use the same number as the AML number.)
DLOP	<Return>	Press <Return> for the next prompt.
AML	0-15	Application Module Link—should be the same as the AML number for the ADAN prompt
CONF	DIR	Direct CSL configuration
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Defining Meridian Mail in the customer data block

Introduction   The Meridian Mail service must be defined in the customer data block using Overlay 15. Have the filled-in data forms from the *Site and Installation Planning Guide* (NTP 555-7041-200) available.

Defining Meridian Mail in the customer data block   To define Meridian Mail in the customer data block, follow these steps.

Step	Action
1	Load Overlay 15 at the Meridian 1 administration terminal.
2	Respond to the prompts as shown in "Overlay 15—Customer data block" on page 12-12. Press <Return> after each prompt until you get to the next one you need.
3	When configuration is complete, enter ****, or type **END** followed by <Return> in response to the prompt REQ.

Routing of unanswered or busy calls   The two sets of prompts in Overlay 15 affect the routing of unanswered or busy calls.

- Flexible Call Forward (FNAD/FNAN/FNAL) is set on a per-customer basis. The call forward DN is defined in the user's telephone data.

- Call Forward No Answer/Busy (MDID/NDID/MWFB) is set on a per-customer basis. All no answer/busy calls are routed to the flexible call forward DN (provided the called set has message waiting allowed [MWA] class of service).

Normally, non-Direct Inward Dialing (DID) calls are routed to Meridian Mail when a no answer or busy condition is encountered. As an option, DID calls can be routed to the attendant's or user's Hunt DN.

Overlay 15—Customer data block

Prompt	Response	Description
REQ	NEW or CHG	
TYPE	CDB	Customer data block, 0 for single customer, 1 for multi-customer
CUST		Enter the customer number (range 0–99).
ATDN		Attendant DN (typically, this is zero)
OPT	MCI	Message center is included for the customer.
IMS	YES	Integrated Voice Messaging feature
IMA	YES	Enable Integrated Voice Messaging attendant for the customer.
FNAD	FDN	Call forward no-answer DID calls are routed to the flexible CFNA DN.
FNAN (or FNAT)	FDN	Call forward no-answer non-DID calls are routed to the flexible CFNA DN.
FNAL	FDN	Call forward no-answer local calls (with CFCT enabled) are routed to the flexible CFNA DN.
CFTA	NO	The CFNA prompt appears only if you respond YES to this prompt.
CFNA		Number of ring cycles before the call is forwarded (the default is 4)
MDID	NO//YES	NO (recommended)—No-answer DID calls are routed to wherever the user wants (including Meridian Mail). YES—No-answer DID calls are routed to Meridian Mail.
NDID	NO/YES	NO (recommended)—No-answer DID calls are routed to wherever the user wants (including Meridian Mail). YES—No-answer DID calls are routed to Meridian Mail.
MWFB	NO/YES	NO (recommended)—No-answer DID calls are routed to wherever the user wants (including Meridian Mail). YES—No-answer DID calls are routed to Meridian Mail.
MATT	YES (NO)	Set to YES, unless Network Message Service (NMS) has been purchased.

Prompt	Response	Description
EEST	NO	Originating party does not receive DTMF feedback. The remote Meridian 1 sites should also be set to NO.
Note: The prompts in the shaded area below apply to NMS only.		
ISDN	NO	NMS only—To change ISDN options
PNI		NMS only—Private Network Identifier. (Within one network, use the same PNI value in overlays 15 and 16. When interworking with different networks, enter the PNI of this Meridian 1 in Overlay 15, and the remote switch PNI in Overlay 16.)
HLOC		NMS only—Home Location Code (ESN) of the Meridian 1 (range 100-999)
LSC		NMS only—Local Steering Code (established in the Coordinated Dialing Plan, or CDP) of the Meridian 1. This prompt appears only for 5- or 6-digit dialing plans.
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
The flexible call forward DN is the Meridian Mail DN. It is entered in the telephone set data block for each Meridian Mail user.		
The other options for FNAD, FNAL, and FNAN are		
att—route to attendant		
hnt—route to the hunt DN		
no—do not route unanswered calls		

Configuring the route data block (NMS only)

Introduction

The procedure that follows explains how to configure the Trunk Route data block for the Network Message Service feature.

Note: Ensure that Digit Manipulation (DMI in Overlay 86) is not used to insert ESN access codes at the sending switch. ESN access code insertion must be done at the receiving switch (INAC in Overlay 16).

Configuring route data block

To configure the route data block, follow these steps.

Step	Action
1	Load Overlay 16 at the Meridian 1 administration terminal.
2	Respond to the prompts as shown in the following table.
3	When configuration is complete, reply **END** to the prompt REQ.

Overlay 16–Route data block parameters

Prompt	Response	Description
REQ		Either NEW or CHG
TYPE	RDB	Route data block
CUST		Meridian 1 customer number
ROUTE		Route number
PNI		Customer Private Network ID of the non-local target Meridian 1
NCRD	YES	Network call redirection will provide the CLID display information.
TRO	YES	Optimize trunk usage on this route.
INAC	YES	Insert ESN access code to incoming private network call.
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Meridian Mail primary ACD queues

Introduction

A separate primary queue is required for each of the Basic voice, Full service voice, and Multimedia port types. Refer to the "Configuring ACD queues on the Meridian 1" chapter in the *System Administration Guide* (NTP 555-7001-30x) for details about configuring ACD queues.

Defining the main Meridian Mail ACD queue

To define and configure the ACD groups for Voice Messaging, follow these steps.

Step	Action
1	Load Overlay 23 at the Meridian 1 administration terminal.
2	Respond to the prompts as shown in the following table.
3	Press <Return> for each prompt that appears after NCFW.
4	At the next REQ prompt, enter **END** followed by <Return>.

Overlay 23—Voice Messaging ACD parameters

Prompt	Response	Description
REQ	NEW	
TYPE	ACD	ACD data block
CUST		Meridian 1 customer number
ACDN		Enter the Meridian Mail main DN. This number should be the same as for VM in the VSDN table.
MWC	YES	This is a Message Center DN.
IMS	YES	This is an Integrated Messaging Service.
CMS	YES	Use the AML Applications Protocol.
IMA	YES	Enable IMS attendant.
IVMS	YES	Integrated Voice Messaging
VSID		Enter the VAS ID (0–15). Refer to Overlay 17 or 22.
MAXP		Maximum number of ACD agents (This should be equal to or greater than the number of voice channels in the installed voice processor cards.)

Prompt	Response	Description
ALOG	YES	Provide automatic logon for the ACD agents associated with this group.
NCFW		Night Call Forward. (This is the destination number for calls rerouted when Meridian Mail is down.)
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Meridian Mail secondary ACD queues

Introduction
The procedure below explains how to configure secondary ACD queues for voice services such as Express Messaging and other voice services (such as voice menus, automated attendants, and networking).

Note: This overlay must be completed once for each agent. The number of agents is the number of channels per port.

Define Voice Services ACD queues
To define secondary ACD queues, follow these steps.

Step	Action
1	Load Overlay 23 at the Meridian 1 administration terminal.
2	Respond to the prompts as shown in the following table.
3	Press <Return> for each prompt that appears after NCFW.

Overlay 23—Voice service and satellite site ACD parameters

Prompt	Response	Description
REQ	NEW	
TYPE	ACD	ACD data block
CUST		Meridian 1 customer number
ACDN	xxxx	Enter the DN of the voice service.
MWC	NO	Set to YES for NMS satellite sites and multi-tenant sites using multi-customer option; Release 16 is required. For Voice Services, set to NO.
MAXP	1	Maximum number of positions
NCFW	xxxx	Enter the Meridian Mail main DN. (If this is an NMS satellite site, use network format.)
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

**Numbering
requirements**

Meridian Mail numbering requirements are slightly different
when the Guest Voice Messaging option is installed. Refer to
the *System Administration Guide* that applies to your site.

The following is a list of recommended service DNs:

- *Guest Messaging DN* This DN is programmed into each
  phone definition, and is the main DN to be entered in
  Overlay 23.
- *Public Voice Messaging DN* This is the published voice
  messaging DN used by staff and guests who want to access
  messages from outside their rooms. This number (ACDN)
  is night-call-forwarded to the main DN (Guest Messaging
  DN).
- *Staff Messaging DN (Optional)*   You can choose to have
  separate ACD queues for staff and guests. This number
  (ACDN) is night-call-forwarded to the main DN (Guest
  Messaging DN).
- *Express Messaging DN* This DN is used for Express
  Messaging.
- *Post Check Out DN*   This number is provided to guests
  upon checkout only. This number (ACDN) is night-call-
  forwarded to the main DN (Guest Messaging DN).

Programming the network loop

Introduction
Before you can begin adding ACD agents, you must program the network loop. You need the *X11 Input/Output Guide* (NTP 553-3001-400), Release 18 document, to complete this procedure.

Programming the network loop
To program the network loop, follow these steps.

Step	Action
1	Load Overlay 22 and print out the configuration record. By reading the configuration record, select a loop that is not already reserved. ***Note:*** The maximum number of channels per loop is 24. Meridian Mail can have up to 64 channels.
2	Load Overlay 17 and configure the network loop as outlined in the *X11 Input/Output Guide* (NTP 553-3001-400). Refer to the "Common Equipment, CEQU" section.
3	Program the Meridian Mail loop by responding to the prompts shown in the following table.
4	Print out the configuration record to verify your programming. Your configuration record will be similar to the example on page 12-20. In this case, Loop 34 could be supporting Meridian Mail.

Overlay 17—Configuring the network loop

Prompt	Response	Description
REQ	CHG	Change
TYPE . . 	CFN	Configuration data block
	<Return>	Press <Return> to go to the next prompt.
CEQU	YES	This prompt is the gate-opener for configuring common equipment parameters.
.	<Return>	Press <Return> to go to the next prompt.

Prompt	Response	Description
.		
TERM	0–159	Enter a loop number you selected for Meridian Mail. TERM means a single-density local terminal loop.
TERD	0–159	Enter a loop number you selected for Meridian Mail. TERD means a double-density local terminal loop.
TERQ	0–159	Enter a loop number you selected for Meridian Mail. TERQ means a quad-density local terminal loop.
	<Return>	Press <Return> until all prompts are finished and your entry is updated.

Example of a configuration record printout

.
TERM
REMO
TERD 034
REMD
TERQ 015   032
REMQ
SUPL 004   008   016
XCT   000   020
TDS   *000   *020   046   062
CONF   *001   *021   044   060
MFSD   *000   *020
MISP   030
.

Verifying the network loop operation

Verifying the network loop

To verify the network loop, follow these steps.

Step	Action
1	Initialize the switch manually by pressing the MAN INT button on the CPU card. If you have a dual CPU, press the main MAN INT button on the active CPU.
	This should automatically enable the loop, and the corresponding LED should turn off. This indicates that the loop is enabled.
2	Enter LD30.
3	STAT and test loop *x* (where *x* represents the particular loop being tested) of the network loop following the acceptance testing procedure in the *Circuit Card Installation and Testing Guide* (NTP 553-3001-211).
4	If you receive the message "0 BUSY, 0 DSBL," the loop connected is successfully established.
5	If you receive an error message, refer to your *X11 Input/Output Guide* (NTP 553-3001-400) to troubleshoot and correct the problem.

Adding ACD agents

Introduction   There must be one ACD agent for each Meridian Mail voice
                     processor channel. The ACD agents are defined as Meridian 1
                     (SL-1) sets in Overlay 11.

                     A terminal number and position ID are required for each agent.
                     For ease of maintenance, assign sequential numbers to the IDs.
                     These numbers can be any that are not already used. For
                     example, if the Meridian Mail main DN is 3800, the IDs for the
                     agents could be 3801, 3802, and so on.

                     Note: It is useful to have the AML disabled when adding
                     agents. If you leave the AML enabled, the service changes will
                     take much longer to perform.

Disabling ESDI ports   To disable ESDI ports, follow this step.

Step	Action
1	To disable the link, use the Overlay 48 command.
	DIS ESDI n (for X11 Release 17 or earlier) where n is the ESDI port number.
	or
	DIS AML n LYR2 (for X11 Release 18 or later) where n is the link number.
	Note 1: If an LD44 audit program is running, VAS002 and SCH3484 error messages may appear on the Meridian 1 console. Ignore them.
	Note 2: Whenever ACD agent data is modified on the Meridian 1, you must make corresponding changes on Meridian Mail. Refer to the "Channel allocation table" section in the "Voice system administration" chapter of the *System Administration Guide* (NTP 555-7001-30x) where x is either 1 for single-customer systems or 2 for multi-customer systems) to change DNs. To modify TNs, refer to the "Node configuration" section in the "Modify hardware" chapter of *System Administration Tools* (NTP 555-7001-305).

**Adding ACD agents
(for SL-1 sets only, not
500 sets)**

To add ACD agents, follow these steps.

Step	Action
1	Load Overlay 11.
2	Respond to the prompts, as shown in the following table, for the first agent.
3	Repeat step 2 for each ACD agent.
4	When all agents have been added, reply **** to the prompt REQ.

Overlay 11—ACD agents

Prompt	Response	Description
REQ	NEW	
TYPE	SL1	
TN	ll s cc u	Enter an ACD agent TN. Ranges: Single-Density Double-Density Loop = 0–159 Loop = 0–159 Shelf = 0–1 Shelf = 0–1 Card = 2–3 Card = 2–3 Unit = 0–3 Unit = 0–7
CDEN	ss/dd/4d	single/double/quad density
DES	yyyyyy	ACD agent description of 1–6 characters
CUST		Enter the customer number.
KLS	1	Key loop segment
CLS	VMA	Enter class of service: voice messaging allowed. Use the default for all other Class of Service options.
KEY	0 ACD xxxxxxx 0 yyyyyyy	Define key 0 as an ACD agent key. DN xxxxxxx is the Meridian Mail DN. ID yyyyyyy is any unused DN in the numbering plan and is used to identify the agent position. It is not dialed by users.

Prompt	Response	Description
	1 SCN zzzzzzz	Define key 1 as a single-call non-ringing DN (SCN-DN). This value is also used when configuring the channel DN in the Channel Allocation table. See "System Status and Maintenance" in your *System Administration Guide* (NTP 555-7001-30x).
	2 MSB	Define key 2 as a Make Set Busy key.
	3 NRD	Define key 3 as a Not Ready key.
	6 TRN	Define key 6 as a Transfer key.
	7 AO3 (letter "O")	Define key 7 as a Conference key.
	9 RLS	Define key 9 as a Release key.
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.)
		If you are finished adding agents, continue with the next step and exit. To add another agent, return to the top of the table.
	****	Exits the overlay

Example

Agent 1   Key 0 ACD 3650 3800

                           Key 1 SCN 2800

Agent 2   Key 0 ACD 3650 3801

                           Key 1 SCN 2801

- For both agents, 3650 is the primary ACD queue DN and is put in the CAT.
- The agent position DNs are 3800 and 3801, and must be unique.
- The secondary ACD queue DNs are 2800 and 2801, and are put in the CAT.

Enabling ESDI ports (X11 Release 17 or earlier)

Introduction

Use the link diagnostic program, Overlay 48 (*X11 I/O Guide* [NTP 553-3001-400], Release 18), to enable the ESDI port for the AML. The procedure below lets you test and set up the link automatically for the AML port.

Enabling ESDI ports (X11 Release 17 or earlier)

To enable ESDI ports, follow these steps.

Step	Action
1	Enter **LD 48** to load Overlay 48.
2	Enter **ENL ESDI *n*** (where *n* is the port number) to enable ESDI port n.
3	Ensure that the AML port is enabled, and the other port on the ESDI port is configured (with the values IADR=1 and RADR=3) and disabled. When the lamp on the ESDI card is lit, it indicates that the card is disabled. If the display LED on the ESDI card is unlit, then at least one port is enabled.
4	Enter **SLFT ESDI *n*** (where *n* is the port number) to test ESDI port n. If the system response is other than OK, see the *SL-1 Maintenance Manual* (NTP 553-2301-511) to analyze the message.
5	Enter **DIS ESDI n** to disable ESDI port n. The system responds with CMS # n active, disable? (y/n).
6	Enter **Y** to disable.
7	Enter **ACMS n** to initiate the Auto Setup sequence and establish a link.
8	Enter ******** to exit from Overlay 48.

Status messages

The following messages appear on the Meridian 1 when the link is up:

- ESDA002—ISDN Applications Protocol Link *<n>* Link Layer is connected)

- CSA003—Active ISDN Applications Protocol Link *<n>* is up

Meridian Mail issues the following System Event and Error Report (SEER) when the link is up:

- 25-05 CSL P Link is up

If other AML (CSL) SEERs appear, refer to the *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).

Activating the AML (X11 Release 18 or later)

Introduction   Use the link diagnostic program, Overlay 48 (*X11 I/O Guide*
                          [NTP 553-3001-400], Release 18), to enable the AML. The
                          procedure outlined below lets you test and set up the AML
                          automatically.

Activating the AML   To activate the AML, follow these steps.

Step	Action
1	Enter **LD 48** to load Overlay 48.
2	Enter **ENL AML n LYR2** to enable AML n.
3	Enter **SLFT AML n** to test AML n. If the system response is other than OK, see the *SL-1 Maintenance Manual* (NTP 553-2301-511) to analyze the message.
4	Enter **DIS AML n LYR2** to disable AML n.
5	Enter **ENL AML n ACMS** to initiate the Auto Setup sequence and establish the link.
6	Enter ******** to exit from Overlay program 48.

Status messages   The following messages appear on the Meridian 1 when the link
                          is up:

- ESDA002 ISDN Applications Protocol Link <n> Link
  Layer is connected

- CSA003 Active ISDN Applications Protocol Link <n> is
  up

Meridian Mail issues the following SEER when the link is up:

- 25-05 CSL P Link is up

If other AML link (CSL) SEERs appear, see the *Meridian Mail
Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).

Setting call routing options for user telephone sets

Introduction   Set call routing options for each user's set as shown in Overlay 10 (see "Overlay 10—2500 set data" on page 12-29) for 2500 sets and Overlay 11 (see "Overlay 11—Meridian 1 set data" on page 12-30) for Meridian 1 sets.

Call routing options and features   The following call routing options and features are available:

- *Routing of Calls to Meridian Mail*   The method of routing calls to Meridian Mail is defined in the Customer Data Block, Overlay 15.

- *Call Forward No Answer*   If the Flexible Call Forward feature is used, enter the Meridian Mail DN in response to the prompts FTR ("Overlay 10—2500 set data" on page 12-29) and FDN ("Overlay 11—Meridian 1 set data" on page 12-30). Otherwise, do not respond to these prompts.

- *Call Forward All Calls*   If Call Forward All Calls is enabled (this is controlled at the telephone set) and there is no answer at the call forward DN, the call is routed to Meridian Mail.

- *Call Forward Busy*   A call to a busy number is routed to the Meridian Mail Service unless one of the following conditions exists:

  – The call is Direct Inward Dial (DID), and Call Forward Busy on DID calls is disabled for the customer (see Overlay 15).

  – The Call Waiting feature is enabled for the user in one of the following two forms:

    – Call Waiting (applies to incoming trunk calls)

    – Station-to-Station Call Waiting (applies to internal calls)

- *Routing to Hunt DNs*   If the user has a hunt DN defined, then the call is routed to the Hunt DN. If there is a no answer/busy condition at the Hunt DN, the call is routed to the Meridian Mail mailbox for the originally called DN.

- *Message Waiting Indication*   A user is notified of a new message by a lit message waiting light or an interrupted dial tone.

For further information on the Meridian 1 feature and services, see the *SL-1 Features and Services Practice* (NTP 553-2301-105).

Overlay 10—2500 set data

Prompt	Response	Description
REQ	NEW, CHG	
TYPE	500	2500 set data block. (500 sets [rotary dial] cannot use Meridian Mail.)
TN	lll s cc u	Terminal number: loop, shelf, card, unit
CDEN	sd, (dd), 4d	Card density is single, double, quadruple. Default is double density.
CUST		Customer number
DN		Directory number
HUNT		Hunt directory number
CLS	MWA	Message waiting is allowed.
	FNA	Call Forward No Answer is allowed.
	HTA	Hunting is allowed.
	XFA	Three-party call conferencing feature
	FBA (FBD)	Call Forward Busy is allowed (denied).
	LPA (LPD)	Message waiting light is equipped (not equipped). If a light is not equipped, users are notified by an interrupted dial tone.
	DTN	Digitone class of service
FTR	CFW yy	Call Forward All Calls. yy is the DN length (4-23).
FTR	FDN xxxx	xxxx is the flexible Call Forward No Answer DN (Meridian Mail DN).
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Overlay 11—Meridian 1 set data

Prompts	Responses	Description
REQ	NEW, CHG	
TYPE		Type of set (for example, SL1, 2317, 3000)
TN	lll s cc uu	Terminal number: loop, shelf, card, unit
CDEN	sd, (dd), 4d	Card density: single, double, or quadruple
CUST		Customer number
FDN		Flexible Call Forward No Answer DN (Meridian Mail DN)
CLS	HTA	Hunting is allowed.
	MWA	Message waiting is allowed.
	FNA	Call Forward No Answer is allowed.
	FBA (FBD)	Call Forward Busy is allowed (denied).
HUNT		Hunt (internal) DN
KEY	0 SCR xxxx	Single call ringing DN, where xxxx is the user's DN
KEY	1-9 MWK yyyy	Add a message waiting key/light, where yyyy is the Meridian Mail DN. For telephone sets with softkeys, you may have to use a higher key number. If the key number you choose is rejected, consult the SCH code description.
	1-9 AO3	Add a three-party conference key. This is necessary for some basic Meridian Mail features.
	1-9 CFW yy xxxx	Call Forward All Calls (where yy is the maximum DN length and xxxx is the call forward DN).
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Saving Meridian 1 changes

Introduction
Use Overlay 43 to save the Meridian 1/SL-1 changes on disk. For details, see the *SL-1 Maintenance Manual* (NTP 555-2301-511).

Saving changes to Meridian 1 configuration
To save changes to the Meridian 1 configuration, follow these steps.

Step	Action
1	Load Overlay 43.
2	At the next "." prompt, enter **EDD** to start dumping the data to disk.
3	Return to step 2, and repeat this step two more times, each time using a new diskette. The system displays all the data being saved. The following message appears: `RECORD COUNT=xxxx` `DATADUMP COMPLETE`
4	Enter ******** to exit from Overlay 43. (The **END** command does not work in this case.)
5	Enter **LOGO** to log out.

Chapter 13

Starting up and configuring Meridian Mail

In this chapter

Overview

Introduction

This chapter assumes that Meridian Mail software has already been installed on your system. If Meridian Mail has not already been installed, you must install it before proceeding. Refer to the *System Installation and Modification Guide* (NTP 555-7001-215) for more information.

Software tapes (Install/data tapes) are included with your system to allow you to reinstall Meridian Mail in case of problems, and to allow you to perform hardware modifications and other specialized functions.

Note: Do not load software from the tapes unless specifically instructed to do so.

Starting up Meridian Mail

Starting up Meridian Mail

To start Meridian Mail, follow these steps.

Note: If any problems occur during startup, see Chapter 14, "Troubleshooting startup problems."

Step	Action
1	Power on the administration terminal and other peripheral devices.
2	On the administration terminal, press <Ctrl> and **W**. Then wait for Logon/Status to appear. Press **P** to select printer.
	The word "Aut" appears at the bottom of the terminal screen to indicate that automatic printing is turned on. The automatic printing allows you to print the bootup messages when you power on the Meridian Mail system. The bootup messages that should appear are outlined in Chapter 14. If you encounter a problem starting up the Meridian Mail system, compare the bootup messages that appear on your system to the proper messages listed in Chapter 14.
3	Before you power up the Meridian Mail system, use the following table to verify the proper behavior of the LEDs at the front of each module.
	Be prepared to observe the hexadecimal display on the front of the Enhanced MMP40 (or MMP40) card.

Behavior of LED indicators

Location of LED	Color	Behavior
Power supplies	Green	On while power switch (DC) or shelf breaker (AC) is on.
VP	Red	On while power to node is on.
Enhanced MMP40 (or MMP40) (hexadecimal display)	Red	Always on while power to node is on. (Can display numbers 0–9 or letters A–F [representing a hexadecimal number], plus a dot to the left and/or right of the letter or number. See "Typical startup indications on hexadecimal display" on page 14-4 for more information.)

Hexadecimal display on Enhanced MMP40 (or MMP40) card

Hexadecimal display
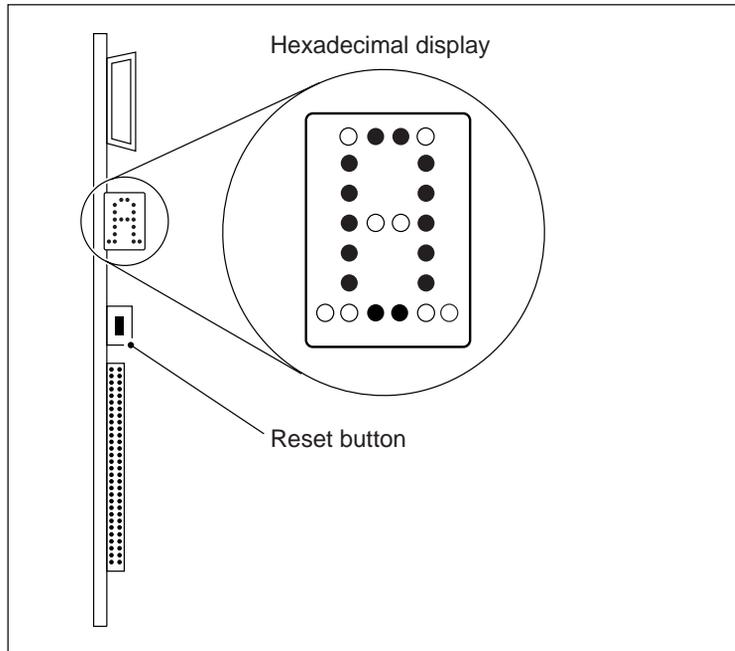
Reset button

G100169

ATTENTION

To reduce stress on the system, use the RESET button on the faceplate of the Enhanced MMP40 (or MMP40) card to reboot the system instead of powering the cabinet off and on. Reset node 1 first, then nodes 2 through 5 in sequence as applicable.

However, if there is a question regarding the state of the system after the system reset, power the system off completely, then power back on to reboot.

---

4   Power up the Meridian Mail system by setting the main breaker switch for each column to ON and shelf breakers or DCEPS switches to ON.

5   If your system has more than one Meridian Mail module, power on module 1, then 2, 3, 4, and 5.

In an AC system, switch on the upper breaker in each module before the lower breaker. In a DC system, switch on the left DCEPS in each module before the right one.

If these LEDs do not behave as described, consult Chapter 17 of this manual.

As part of the bootup process, the administrator's terminal displays a series of diagnostic and information messages.

6   Check for power problems.

LEDs on the power units at the base of the column indicate that power is on. You should hear the fans in the base of the column.

7   On the Enhanced MMP40 (or MMP40) card, check that the hexadecimal display shows "A."

The "A" indicates that the bootup was successfully completed on that node. If the hexadecimal display does not read "A" when bootup and bootROM diagnostics are completed, refer to "Typical startup indications on hexadecimal display" on page 14-4.

8   Check your hard copy of bootup messages. Compare the printout to "Bootup stages" on page 14-6.

If the system stops at a point in the bootup or does not behave as expected, follow the troubleshooting procedure in that chapter.

9   On the administration terminal, press <Ctrl> and <Print Screen> to turn off the automatic printing.

The word "Aut" should disappear from the bottom of the terminal screen.

10 Check the terminal display by pressing <Ctrl> and **W** at the same time.

   a. If information appears in a box with straight lines, close the window by pressing **s**.

   b. If information appears in a box composed of letters or other characters, refresh the screen by pressing **i**, then **f**.

11   Perform the procedures in the "Software installation" chapter
     of the *System Installation and Modification Guide*
     (NTP 555-7001-215).

     When you have completed these procedures and the software
     has loaded, the Logon screen appears.

```
                          Logon/Status

                 MMM        MMMERIDIAN
               MMMMM      MMMMM
              MMMMM      MMMMM
          MMM MMM MMM MMM        MMM         MMMAIL
          MMM MMMMM  MMM      MMMMM         MMMMM
          MMM   MMM      MMM     MMMMMM     MMMMM
          MMM           MMM       MMM MMM MMM MMM
            MMM          MMM     MMM  MMMMM  MMM
            MMM          MMM     MMM   MMM   MMM
            MMM          MMM    MMM          MMM
            MMM          MMM    MMM          MMM
            MMM          MMM    MMM          MMM
            MMM          MMM    MMM          MMM
          MMM          MMM    MMM          MMM
        MMM          MMM    MMM          MMM

                         Copyright  (c)  Northern Telecom, 1999
     _____

     Select a softkey >

      _____       _____  _____  _____
     |  Logon    |     | System    || Silence   || DSP Port  |
     |           |     | Status    || Alarm     || Status    |
      ‾‾‾‾‾‾‾‾‾‾‾       ‾‾‾‾‾‾‾‾‾‾‾  ‾‾‾‾‾‾‾‾‾‾‾  ‾‾‾‾‾‾‾‾‾‾‾
```

G101101

12   To check the system status to make sure the channels are
     functional and all links are up, press the [System Status]
     softkey.

     Node Status should be InService for all of your nodes, and DSP
     Port Status should be idle for all of the voice ports you have
     installed. See the following illustration. For a full description of
     this screen, see your system administration guide.

     Note 1: Some components will go through transitional states,
     such as loading, before becoming Idle or InService. It may take
     a few minutes for these final states to display.

     Note 2: If you power up Meridian Mail without the switch
     connected, the diagnostics will run and the software will load,
     but the channels will time out and fail, and error messages will
     appear.

```
                    System Status and Maintenance

System Status:      InService    Alarm Status: Critical = Off  Major = Off  Minor = On

Last Event:         41-97 VoiceBase Loading on Node 1                    4/19 16:31

Link Status: 1-7-2: InService

                                DSP Port Status                    Storage Used
Node  Type  Status     Active  Idle  OutSv  Faulty  Pending  Others  Voice  Text
 1    MSP   InService                                                  1%     4%
 2    SPN   InService    0      16     0       0        0       0      1%     4%
 3    SPN   InService    0      16     0       0        0       0      1%     4%
 4    SPN   InService    0      16     0       0        0       0      1%     4%
 5    SPN   InService    0      16     0       0        0       0      1%     4%




_____

Select a softkey >

    Exit
```

G101104

13   If the total number of ports for each node is incorrect, refer to
     the "Hardware modification" chapter in the *Meridian Mail
     System Administration Tools* (NTP 555-7001-305).

14   If all appears to be correct, press [Exit] to return to the Logon
     screen.

15   Log on to the system and change the default logon and
     password.
     Meridian 1 Representative's PBX password: **0000**
     (four zeros)

     System administrator's terminal user ID: **system**

     System administrator's terminal password: **adminpwd**

     System administrator's Meridian 1 PBX password: **MMAIL**
     (uppercase)

16   Verify that remote login works by setting the A/B switch to
     Remote and dialing in.

     Note: If you are using a high-speed (over 2400 bps) modem
     (for example, the U.S. Robotics 14.4), and the connection fails,
     wait 15 seconds before attempting to reconnect.

17   Reset the switch to Local.

18   Check that the customer number is correct on the General
      Options screen selected from the General Administration
      menu.

      Note 1: The system is delivered with ACD agent TNs and
      DNs as well as the main voice messaging DN (as defined
      in Voice System Administration, Channel Allocation Table)
      already configured. If the values shown on the status screen
      are missing or incorrect, see the *Meridian Mail System
      Administration Tools* (NTP 555-7001-305) for hardware
      modification information.

      Note 2: For details on Meridian Mail configuration, refer to
      the section on setting up the system in your system
      administration guide.

19   Set up the voice service DNs (Voice Messaging, Express
      Messaging, and so on). Use the Voice Service DN Table screen
      accessed through the Voice Administration menu.

20   Check the system by adding some mailboxes and using
      some Meridian Mail features.

21   Log off.

22   Check the status of each DSP port to make sure they are
      all functional, by selecting the DSP Port Status option.

      Port status should be Idle for all of your ports. See the
      following illustration.

```
                              DSP Port Status

DSP Port Status

       Ports
Node  1  2  3  4  5  6  7  8  9  10  11  12
1     .  .  .  .  .  .  .  .  .   .   .   .




a = Active/In Use      . = Idle          O = Out of Service   ? = Unknown
F = Faulty             P = Pending       U = Unequipped       R = NoResource
L = Loading            C = CourtesyDown




_____

Select a softkey >

     Exit
```
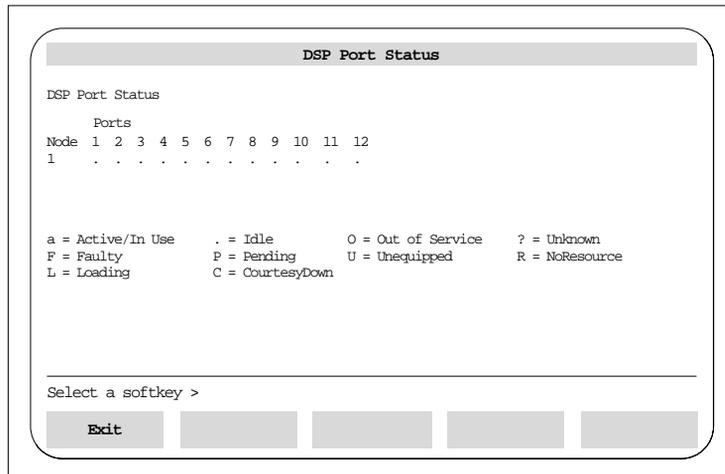
G101103

> ***Note:*** For a full description of this screen, see your system administration guide. This guide also describes how to run out-of-service diagnostics for ports that do not come to Idle status on bootup or to active status during the testing described in step 23 to step 26.

23   While watching this screen, dial the voice mail access DN from a phone connected to the switch.

24   Verify the entries in the Voice Service Directory Number (VSDN) table.

25   Note which channels become active.

26   Ensure there is no noise on the line.

27   Release the line, and repeat step 23 to step 26 until all ports have been tested.

28   If all appears to be OK, press [Exit] to return to the Logon screen.

29   Replace the faceplates that cover the PCPs.

> ***Note:*** Use caution when folding and positioning the new SCSI cable. The cable has to be twisted to ensure proper lineup of the pins. Also ensure the cable is properly folded and positioned away from the edges, or it may become pinched when replacing the metal cover.

30   Install the I/O covers and the front and rear doors of the modules.

Configuring Meridian Mail

Introduction   When the Meridian Mail logon screen appears, follow this
                        procedure.

Configuring Meridian   To configure Meridian Mail, follow these steps.
Mail

Step	Action
1	Once it has rebooted, verify that the system is working properly by adding some mailboxes and trying some Meridian Mail features.
2	Verify that the customer number (as defined in the General System Administration menu, under System Options) is correct.
	Note: After making any changes, reboot the system. To reboot the system, power it down for ten seconds, then power it back on.

Enabling/disabling disk shadowing

Introduction   If you have the disk shadowing feature, disks are added to Meridian Mail in pairs. When new data is written to disk, both drives in a pair are updated at the same time with the same information. If one of the drives in a pair fails, it can be removed from service and replaced without loss of data or interruption of service.

Enabling/disabling disk shadowing   To enable or disable disk shadowing, follow these steps.

Step	Action
1	Log on to Meridian Mail.
2	Select System Status and Maintenance. (See the following illustration.)

```
┌──────────────────────────────────────────────────────────┐
│  ┌────────────────────────────────────────────────────┐  │
│  │          System Status and Maintenance             │  │
│  │                                                    │  │
│  │                                                    │  │
│  │        1    System Status                          │  │
│  │                                                    │  │
│  │        2    Card Status                            │  │
│  │                                                    │  │
│  │        3    DSP Port Status                        │  │
│  │                                                    │  │
│  │        4    Channel Allocation Table               │  │
│  │                                                    │  │
│  │        5    System Event and Error Reports         │  │
│  │    *   6    Disk Maintenance                       │  │
│  │                                                    │  │
│  │                                                    │  │
│  ├────────────────────────────────────────────────────┤  │
│  │ Select an item >                                   │  │
│  │ ┌──────┐ ┌──────┐ ┌──────┐ ┌────────┐ ┌──────┐     │  │
│  │ │ Exit │ │      │ │      │ │Silence │ │      │     │  │
│  │ │      │ │      │ │      │ │ Alarm  │ │      │     │  │
│  │ └──────┘ └──────┘ └──────┘ └────────┘ └──────┘     │  │
│  └────────────────────────────────────────────────────┘  │
└──────────────────────────────────────────────────────────┘
                                                      G101107
```

Step	Action
3	Select Disk Maintenance. (See "Disk Maintenance screen" on page 13-12.)
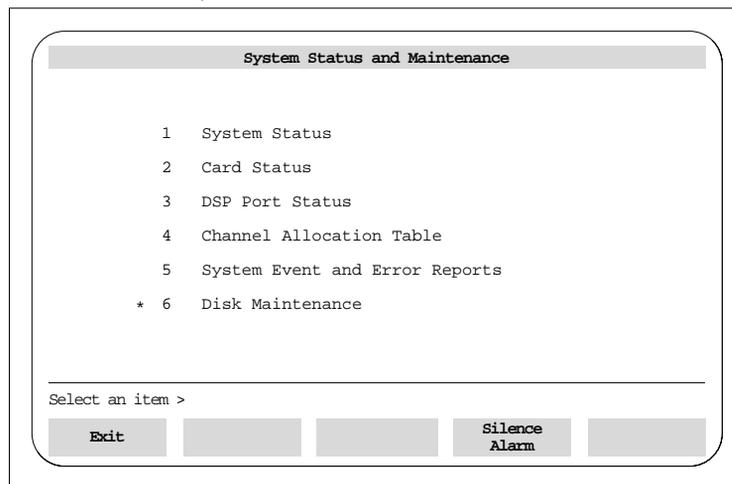
Step	Action
4	Press the [View Disk Pair] softkey.
	You are prompted for the number of the disk pair you want to view.
5	Enter the number of the disk pair.
	The Disk Pair Status screen appears.
6	If one disk in the pair is ReadWrite and the other is not, press the [Enable] softkey.
	The system determines the source of the sync by choosing the disk that is in ReadWrite mode and attempts to sync the other disk.
	If the sync is successful, both disks are shown as ReadWrite.

Disk Maintenance screen

The Disk Maintenance screen shows the status of each disk pair in the system. The three possible states for a disk pair are InSync, Synching, and OutofSync.

```
                    System Status and Maintenance


Disk Maintenance

System Status: InService     Alarm Status: Critical = Off   Major = On   Minor = Off

Pair Number    Node Type     Status

   1           MSP           InSync
   2           SPN           Synching     81% done
   3           SPN           OutofSync
   4           SPN           InSync
   5           SPN           InSync




_____

Select a softkey >

     Exit        View Disk
                   Pair
```
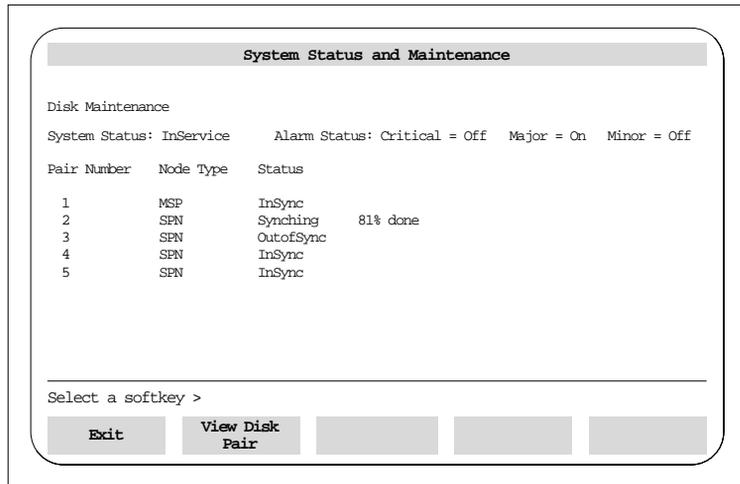
G101108

The following fields appear on the Disk Maintenance screen:

• *System Status* This field displays the current system status.

• *Alarm Status* This indicates whether there are any Critical, Major, or Minor alarms.

• *Pair Number* This is the number of each disk pair in the system.

- *Node Type* This is the type of node on which the pair resides.

- *Status*   This is the synchronization status. A disk pair can be in one of the following states:

  - *InSync* Both disks are operational and in sync with each other.

  - *Synching* The disks are currently synching (that is, after pressing [Enable] in the Disk Pair Status screen).

  - *OutofSync* One of the disks is NoAccess and, therefore, out of sync with its shadowed pair. This happens if the system automatically puts a bad disk in No Access or if you disable the disk to replace or repair it.

Disk Pair Status screen

If a SEER has alerted you to the fact that the system has automatically taken a disk out of service, check the Disk Pair Status by pressing the [View Disk Pair] softkey to determine which pair is out of sync. When you press [View Disk Pair], the Disk Pair Status screen appears.

```
                    System Status and Maintenance


Disk Pair Status for Pair X

System Status: InService      Alarm Status: Critical = Off   Major = On   Minor = Off

Node          Primary      Shadow

  3           ReadWrite    NoAccess
_____
Select a softkey >

   Exit          Enable        Disable
```
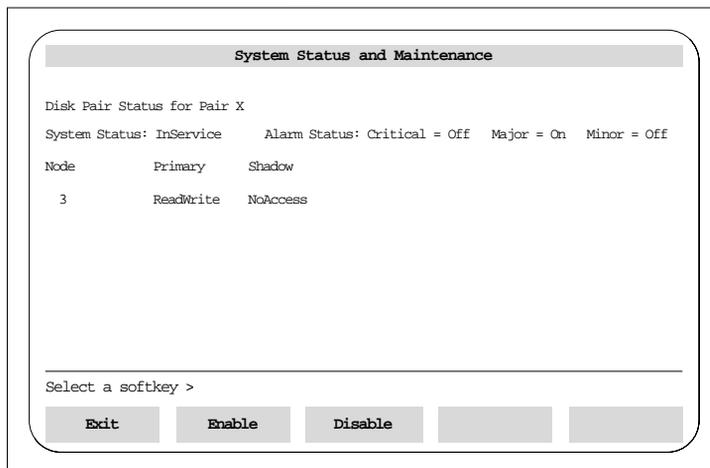
G101109

The following fields appear on this screen:

- *System Status*   This is the current system status.

- *Alarm Status*   This indicates whether there are any Critical, Major or Minor alarms.

- *Node*   This is the node on which the disks reside.

- *Primary*   This indicates the status of the primary disk.

- *Shadow*   This indicates the status of the shadowed disk. A disk may be in one of the following states:

  – *ReadWrite* indicates that the disk is currently available to be read and written to. A disk that is in this state is operating normally.

  – *NoAccess* indicates that the disk is not available to be read or written to. This indicates that the disk has been disabled automatically by the system or by the administrator with the [Disable] softkey.

  – *SynchSource* during a disk sync, this indicates that the disk is the source of a disk synchronization.

  – *SynchDestination* during a disk sync, this indicates that the disk is the destination of a disk synchronization.

Acceptance testing of Meridian Mail

Conducting acceptance testing

To conduct acceptance testing of Meridian Mail, follow these steps.

Step	Action
1	Check basic features by performing all the functions outlined in the *Voice Messaging User Guide* (P0839942 or P0839950).
2	Test system and administrative features as described in the *Meridian Mail System Administration Guide* that applies to your system (NTP 555-7001-30x).
3	Test optional features using the appropriate NTP. See the *Meridian Mail NTP Contents Overview* (NTP 555-7001-000) for NTP listings.
4	Replace the module's side panels and front and rear doors.

Chapter 14

Troubleshooting startup problems

In this chapter

Overview

Introduction

When following the procedures in this section, go to the next step as long as the fault persists. When the fault has cleared, reconnect or replace items as necessary, ensure that the power is on, and replace the panels (unless specifically instructed otherwise).

Courtesy down

Several troubleshooting procedures recommend that you power down a node or the entire system. If you need to power down the entire system, it is recommended that you begin by performing a courtesy-down procedure on the system, then disable the node(s), and, finally, power down the system. This ensures that users do not experience abrupt termination of service.

For more information on how to courtesy down nodes and the system, refer to the *Meridian Mail System Administration Guide* (NTP 555-7001-30x) appropriate to your site.

Modules

If your system has more than one Meridian Mail module, power on module 1, followed by module 2, and so on. Power modules off in the opposite order.

To power an AC module on or off, set the shelf breakers to ON or OFF. Switch off the lower breaker in each module before the upper breaker. Switch breakers on in the opposite order.

To power a DC module on or off, set the DCEPS switches to ON or OFF. Switch off the right DCEPS in each module before the left one. Switch DCEPS on in the opposite order.

Normal startup sequence

Introduction

When you power on Meridian Mail, the Enhanced MMP40 (or MMP40) single-board computer must first initialize itself and perform self-diagnostics. Then it boots up the other system elements (non-prime nodes and the disk subsystem) and performs diagnostics on them. Finally, it loads the Meridian Mail operating system and the user interface.

The Enhanced MMP40 (or MMP40) initialization phase can be monitored using the hexadecimal display on the edge of the card, while the bootup can usually be monitored using the text displayed on the terminal (although the two will overlap at some points). The following sections describe the hexadecimal display and the progression through bootup.

> ### ATTENTION
>
> If you encounter difficulty during a normal startup sequence, refer to Appendix D, "Enhanced MMP40 and MMP40 troubleshooting flowcharts" to determine causes and solutions for potential problems.

Power on initialization— hexadecimal display description

On the upper-front edge of the Enhanced MMP40 (or MMP40) card is a hexadecimal display that can display a hex digit with an optional decimal point on either side of it. The display provides information for diagnosing some system problems in the field.

The hardware powers up in a state where both decimal points will be on, with the remainder of the display blank. This is a power on indication. On a normally functioning Enhanced MMP40 (or MMP40) board, this state is generally not seen because of the very quick transition to the ".0" state.

The following table shows the progression of the startup indications on the hexadecimal display.

Typical startup indications on hexadecimal display

Display shows	Description
. .	Power on (displays *very* briefly)
.0	Begin execution of BootROM
.1 to .4	Initialization progressing
During normal bootup, the terminal displays (described in the next section) occur simultaneously with the following hexadecimal displays.	
.5	Initialization complete (if on prime node or stand-alone)
.6	Appears on non-prime node, waiting for direction from PRM
.0., .1., .2., ...	Running board-level diagnostics
.7 or .8	Load operating system from either local SCSI (.7) or bus tap (.8), depending on load mechanism
.9	BootROM jumping to beginning of Meridian Mail kernel
1. (blinking dot)	Start of Meridian Mail kernel
2. (blinking dot)	Meridian Mail is jumping to operating system.
3. (blinking dot)	Start of Meridian Mail operating system
4. (blinking dot)	Meridian Mail operating system functioning properly
A. (blinking dot)	Node is InService and application programs loaded (Logon screen should be displayed)

Normal bootup sequence—messages on terminal

Once the initialization is complete, the system begins to boot up and a series of messages appears on the terminal. In a normal bootup, the system passes through several distinct stages as different elements of Meridian Mail are brought up.

"Bootup stages" on page 14-6 shows the key phrases that will appear on-screen, informing you that the various stages are proceeding normally. The intermediate text between these key phrases has been omitted, since its content depends on your specific configuration.

You can set the printer to print out a hard copy of the bootup sequence as described in "Printing a hard copy of the bootup sequence" on page 14-5.

If bootup does not proceed as described in "Bootup stages" on page 14-6, look in the Symptom column of "Troubleshooting bootup problems" on page 14-10 to identify the problem, and then follow the corresponding steps in the "Possible causes and actions" column.

Printing a hard copy of the bootup sequence

To print a hard copy of the bootup sequence, follow these steps.

Step	Action
1	Restart the system.
2	Press <Ctrl> and <Printscreen> to turn on automatic printing. The bootup messages begin printing on the printer and AUT. appears at the bottom of the terminal screen.
3	When you are finished printing, press <Ctrl> and <Printscreen> again to turn off automatic printing. AUT. disappears from the bottom of the screen.
4	Compare the bootup printout to the information presented in "Bootup stages" on page 14-6.

Bootup stages

Stage	Key phrases	Comments

1	`Waiting for timer...`
	`.`
	`.`
	`.`
	
	`Copyright yyyy, Nortel Networks`
	`     ********************`
	`     * NT4R45aa Firmware *`
	`     *   Enhanced MMP40FW *`
	`     *     Mmmm DD, YYYY  *`
	`     ********************`
	`.`
	`.`
	`.`
		Where aa can be any two letters and Mmmm DD, YYYY is the date of the firmware's release

2	`1]  Checksum Tests`
	`     1) 1st PROM`
	`     2) 2nd PROM`
	`     3) 3rd PROM`
	`     4) 4th PROM`
	`2]  DRAM Tests`
	`     1) 5 long words`
	`     2) Page walk`
	`     3) Burst read`
	`      .`
	`      .`
	`      .`
		Executing bootROM diagnostics.
		
		DRAM testing.

3	`Performing SCSI Bus Reset...OK.`
	`.`
	`.`
	`.`
		Executing SCSI controller tests.

4	`SCSI initialization complete.`
	`.`
	`.`
	`.`	

Stage	Key phrases	Comments

5	`Meridian Mail Kernel Startup`
	
	`.`
	`.`
	`.`	

6	`OSP successfully loaded`
	
	`.`
	`.`
	`.`
		Terminal screen should clear. Operating system is loaded on the node.

7	`Enter CI to Load CI Only (5 sec)`
	
	`.`
	`.`
	`.`	

8	`Loading PRM`
	
	`.`
	`.`
	`.`
	
	`Program Resource Manager Ver. x`
	`.`
	`.`
	`.`
		Where x can be a combination of characters or digits.

9	`PRM:  Waiting for Seer Server to register`
	`.`
	`.`
	`.`
	
	`PRM RebootNode: resetting node 2 waittime 0`
	`.`
	`.`
	`.`
		SEER output on the printer should be expected a few seconds after this message.
		
		If this is a multi-node system, then all the non-prime nodes will be reset here.

10	`PRM Running startup diagnostics`
	`.`
	`.`
	`.`
	
	`PRM: OSP is Up - node 2`
	`.`
	`.`
	`.`
		Diagnostic programs are run.
		
		On multi-node systems, operating system (OS) is loaded on non-prime nodes.

Stage	Key phrases	Comments
11	`PRM: Startup diags finished, starting up sys-` `tem`	Application programs are to be loaded.
12	The Logon screen comes up as shown in the following illustration.	

```
                          Logon/Status

                    MMM          MMMERIDIAN
                  MMMMM      MMMMM
                 MMMMM      MMMMM
              MMM MMM MMM MMM       MMM          MMMAIL
              MMM MMMMMM MMM      MMMMM        MMMMM
              MMM    MMM     MMM     MMMMMM     MMMMMM
              MMM          MMM     MMM MMM MMM MMM
              MMM             MMM      MMM   MMMMM   MMM
              MMM             MMM      MMM    MMM    MMM
              MMM             MMM     MMM            MMM
              MMM             MMM     MMM            MMM
              MMM             MMM     MMM            MMM
              MMM             MMM     MMM            MMM
              MMM             MMM     MMM            MMM

                            Copyright  (c)  Northern Telecom, 1999
              _____

              Select a softkey >

              ┌─────────┐ ┌─────────┐ ┌─────────┐ ┌─────────┐ ┌─────────┐
              │  Logon  │ │         │ │ System  │ │ Silence │ │ DSP Port│
              │         │ │         │ │ Status  │ │  Alarm  │ │ Status  │
              └─────────┘ └─────────┘ └─────────┘ └─────────┘ └─────────┘
```

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Checking the system status

Check the system status to make sure the channels are functional and all links are up. Press the [System Status] softkey. Node Status should be InService for all of your nodes, link status should be InService, and DSP Port Status should be Idle for all of the voice ports you have installed. See the following illustration.

```
┌─────────────────────────────────────────────────────────────────┐
│  ┌───────────────────────────────────────────────────────────┐  │
│  │                                                           │  │
│  │             System Status and Maintenance                 │  │
│  │                                                           │  │
│  │  System Status:     InService    Alarm Status: Critical = Off  Major = Off  Minor = On │
│  │                                                           │  │
│  │  Last Event:        41-97 VoiceBase Loading on Node 1          4/19 16:31 │
│  │                                                           │  │
│  │  Link Status: 1-7-2: InService                            │  │
│  │                                                           │  │
│  │                               DSP Port Status        Storage Used │
│  │  Node  Type  Status    Active  Idle  OutSv  Faulty  Pending  Others  Voice  Text │
│  │   1    MSP   InService                                        1%    4%  │
│  │   2    SPN   InService    0     16     0      0       0       0      1%    4%  │
│  │   3    SPN   InService    0     16     0      0       0       0      1%    4%  │
│  │   4    SPN   InService    0     16     0      0       0       0      1%    4%  │
│  │   5    SPN   InService    0     16     0      0       0       0      1%    4%  │
│  │                                                           │  │
│  │                                                           │  │
│  │                                                           │  │
│  │  ───────────────────────────────────────────────────────  │  │
│  │  Select a softkey >                                       │  │
│  │  ┌────────┐ ┌───────┐ ┌───────┐ ┌───────┐ ┌───────┐      │  │
│  │  │  Exit  │ │       │ │       │ │       │ │       │      │  │
│  │  └────────┘ └───────┘ └───────┘ └───────┘ └───────┘      │  │
│  └───────────────────────────────────────────────────────────┘  │
└─────────────────────────────────────────────────────────────────┘
                                                          G101104
```

Note: Node status may be Loading when you first look at the screen, and port status may be something other than Idle, but the nodes should become InService and the ports should become Idle, one at a time, within a few minutes.

See the "System status and maintenance" chapter in the *System Administration Guide* (NTP 555-7001-30x) for further information on the status of the system, link, nodes, and ports.

Troubleshooting bootup problems

Introduction   If bootup does not proceed as described above, look in the
                            Symptom column of the following table to identify the problem,
                            and then follow the corresponding steps in the "Possible causes
                            and actions" column.

Symptom	Possible causes and actions
The admin terminal screen remains blank.	Follow "If terminal remains blank" on page 14-12.
Messages stop appearing on the screen, but the Meridian Mail Logon screen does not appear.	Follow the procedures "System fails to boot completely" on page 14-21.
When the System Status screen is checked, a node is faulty.	Check SEERs for failed hardware diagnostics. Follow the actions documented for the SEERs in the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).
	If all non-prime nodes (type SPN) are faulty, check the system bus. Follow "Diagnosing system bus problems" on page 14-27.
	If only one node is faulty, run out-of-service diagnostics on that node's Enhanced MMP40 (or MMP40) card.
The logon screen appears, but node status remains Loading.	Check SEERs for programs that could not be loaded.
	Follow the actions documented for the SEERs in the *Maintenance Messages (SEERS) Guide* (NTP 555-7001-510).
A node continually reboots.	1 Replace the Enhanced MMP40 (or MMP40) card.
	2 Perform the system bus checks. Follow "Diagnosing system bus problems" on page 14-27.
The logon screen appears, but not all voice channels come into service.	Look at the DSP Port Status screen. Ports may be left Faulty or unconfigured due to hardware problems.
	Ports may be left Loading, Pending, or No Resources due to configuration or software problems.
	Run out-of-services diagnostics as described in your *System Administration Guide* (NTP 555-7001-30x) and then enable the voice card.
There are disk errors on bootup-device sense key, or driver errors.	Refer to "Troubleshooting stage 3 bootup failure—disk subsystem check" on page 14-23 and "Troubleshooting stage 4 bootup failure" on page 14-24, and Chapter 17, "Common disk subsystem problems."
All nodes time-out while booting, or nodes unload while in service.	Perform the system bus checks. Follow "Diagnosing system bus problems" on page 14-27.

Troubleshooting bootup problems

Symptom	Possible causes and actions
Only one node comes up.	Perform the system bus checks. Follow "Diagnosing system bus problems" on page 14-27
The logon screen appears, but link status is not InService.	Go to Chapter 18, "AML (ISDN/AP) link maintenance."
One node will not come up.	Perform BootROM diagnostic check procedure for the node.
The hexadecimal display on Enhanced MMP40 (or MMP40) card shows "B**.**"	Indicates node is in-service standby. Minor software error. Contact your Nortel Networks support organization.
The hexadecimal display on Enhanced MMP40 (or MMP40) card shows "C**.**"	Indicates node is out of service. Enable the node from the MMI as described in the *System Administration Guide*.
The hexadecimal display on Enhanced MMP40 (or MMP40) card shows "D**.**"	Indicates in-service trouble. While the Enhanced MMP40 (or MMP40) card is still healthy, a component such as an NVP card or a disk may be faulty. Check the NVP cards for that node and perform "Troubleshooting stage 3 bootup failure—disk subsystem check" on page 14-23 and "Troubleshooting stage 4 bootup failure" on page 14-24, and refer to Chapter 17 "Common disk subsystem problems."
On the Enhanced MMP40 (or MMP40) card hexadecimal display, the blinking dot (during states "1" and later) has stopped blinking.	Indicates a potential software problem or faulty display. Note the state at which the dot stopped blinking and if the system is running normally. Reboot the system and observe the display. If the problem persists, contact your Nortel Networks support organization.
The hexadecimal display on Enhanced MMP40 (or MMP40) card flashes continuously.	Indicates a faulty Enhanced MMP40 (or MMP40) card. 1 Note the state at which the display began flashing. 2 Replace the Enhanced MMP40 (or MMP40) card.
The hexadecimal display on Enhanced MMP40 (or MMP40) card returns to ".0." state.	The system has detected an unrecoverable hardware fault and is attempting to restart the node. If the system is unable to reboot the node successfully, note the display immediately before the point at which the state reverts to ".0." , and contact your Nortel Networks support organization.
The hexadecimal display on Enhanced MMP40 (or MMP40) card stops at a particular bootup state.	Note the state at which the display stopped and reboot the system. If the problem persists, call your Nortel Networks support organization.

Troubleshooting terminal problems

Introduction   The following procedures should help determine if there is a
                          problem with your Meridian Mail terminal or the prime node
                          Enhanced MMP40 (or MMP40) PCP. Follow each step in the
                          troubleshooting procedure until you have solved the problem.

If terminal remains   If the terminal remains blank, follow these steps.
blank

Step	Action
1	Reboot the system and observe the hexadecimal display on the prime node's Enhanced MMP40 (or MMP40) card.
	If the display stops at .3, then there may be a problem with the terminal or its connection.
2	If the power light on the terminal is not lit, check for power problems as follows:
	a. Check that the terminal power switch is ON.
	b. Verify that there is power at the socket the terminal is plugged in to.
	c. Check the power cord, and replace if necessary.
	d. If all of the above tests are OK, replace the terminal.
	e. Check the terminal cabling and setup as described in "Checking terminal cables and setup" on page 14-13.
	f. If the power LED remains unlit, replace the prime node's Enhanced MMP40 (or MMP40) card and restart the system.
3	If the hexadecimal display remains blank, proceed as follows:
	a. Check for Meridian Mail power problems as described in "Power problems" on page 14-15 "DC system power problems" on page 14-15 "Testing the pedestal power supply" on page 14-16 "Testing the power harness" on page 14-18 "Testing the DCEPS" on page 14-19.
	b. Replace the prime node's Enhanced MMP40 (or MMP40) card and restart the system.
4	If the hexadecimal display is displaying information but the screen remains blank, there may be a problem with the MMP40 card or with internal or external RS-232 cables. Check the RS-232 cables and replace the Enhanced MMP40 (or MMP40) card or cards, and restart the system.

Step	Action
5	If none of these steps solves the problem, contact your Nortel Networks support organization.

Checking terminal cables and setup

To check the terminal cables and setup, follow these steps.

Step	Action
1	Make sure your terminal is installed and configured as described in Appendix A of this manual.
2	If the terminal was working previously, enter terminal setup and perform "Clear communications," then reset the terminal.
3	If the terminal was working previously and the printer is printing SEER reports, enter terminal setup and verify that the terminal is not in controller print mode. The print mode should be Normal Print Mode.
4	Ensure that the Hold screen key is not on. If the terminal indicates Hold (status area at bottom of screen or LED on keyboard), press <F1> to release the hold. This applies to all terminals except the HP700/32 where the user Aux Mode is set to OFF.
5	Check all cable connections to the terminal.
6	Replace the cables and adapters one at a time.
7	Check the printer setup and status. Refer to Chapter 11 for correct printer setup.
8	Clear any printer faults (out of paper, paper jam), and put the printer online.
9	To make sure the terminal is functional, enter setup mode, change the terminal setup to enable LOCAL ECHO and, with the printer attached, enter text from the terminal keyboard. The text you enter from the keyboard should echo on the terminal screen.
10	Disable LOCAL ECHO.
11	Check the terminal primary port using the method described in the terminal owner's manual.

Step	Action
12	Add a null modem adapter if one was not installed between Meridian Mail and the terminal. Remove the null modem adapter if one was installed.
13	If all of the above tests are OK and none of the replacements fixes the problem, replace the terminal.

Power problems

Before troubleshooting AC or DC system power problems

Before proceeding to the AC or DC section, follow these steps.

Step	Action
1	Power off all modules.
2	Loosen and reseat all power supplies.
3	Power on all modules.

If the problem is not fixed, go to the procedure on DC system power problems or AC system power problems.

DC system power problems

To troubleshoot DC system power problems, follow these steps.

Step	Action
1	Remove the front doors from all modules in the system.
2	If no LEDs are lit on any module, go to "Testing the pedestal power supply" on page 14-16 and test the pedestal power supply.
3	If no LEDs are lit on any module above a certain module, go to "Testing the power harness" on page 14-18 and test the power harness at the lowest module with no LEDs lit.
4	If no LEDs, including the LEDs on the DCEPS, are lit on a single module or on a single side of a module, go to "Testing the DCEPS" on page 14-19 and test the DCEPS.
	Note: A side of a module that contains a power supply but no PCPs or disk drives will give a DCEPS failure indicator.

Testing the pedestal power supply

To test the pedestal power supply, follow these steps.

Step	Action
1	Verify the main DC voltage by measuring for –48 V DC to –52 V DC.
	To measure this voltage, use a volt/ohm meter. Measure between each BAT and the corresponding BATRTN terminal lug designations. See "Universal DC pedestal, NT7D67CA" below, and "DC pedestal, NT6D53AA" on page 14-17.
	Note: The voltage between BAT2 and BAT3 and their corresponding BATRTN terminals is zero unless you have three or four modules in the column.
	If voltage measured is incorrect, there may be a problem with the UPS system.
	See *SL-1 Fault Clearing* (NTP 553-3001-510) for testing procedures of the UPS.
2	If the voltage is correct, go to "Testing the power harness" on page 14-18.

Universal DC pedestal, NT7D67CA

Measure between each BAT terminal (0/1, 2/3) and the corresponding BATRTN terminal.
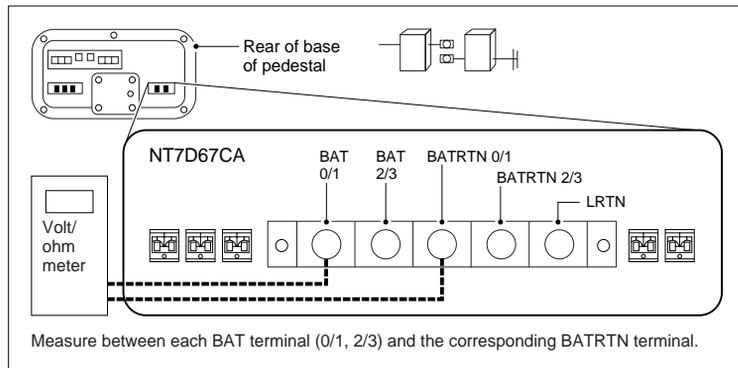
G101105

DC pedestal, NT6D53AA

To CB0 (UEM 0) and CB5 (blower)
To CB1 (UEM 1)
To CB2 (UEM2)
To CB3 (UEM3)
To connections in PDU

TB1 in pedestal

Volt/ ohm meter

— BAT0 — BAT1 — BAT2 — BAT3 + BRTN0 + BRTN1 + BRTN2 + BRTN3 LGND LRTN

0   1   0   1

Measure between each BAT terminal (0/1, 2/3) and the corresponding BATRTN terminal.
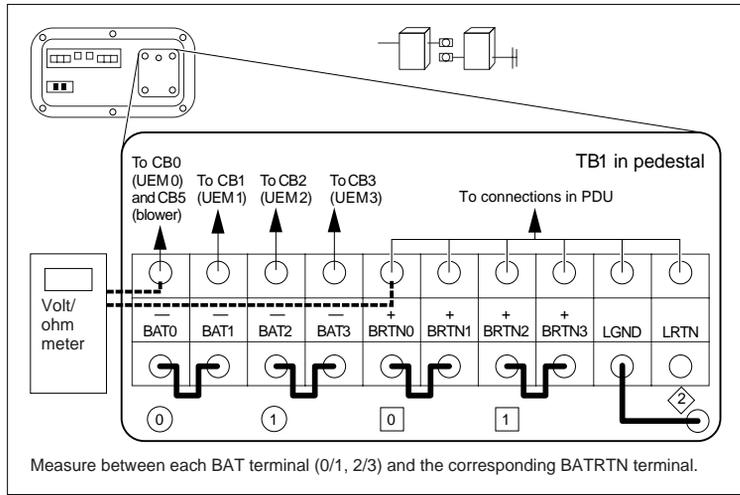
G101106

Testing the power harness

To test the power harness, follow these steps.

Note: Test the power harness at the lowest module with no LEDs lit.

Step	Action
1	Check the DC voltage at the DCEPS connectors (see the illustration below).
	a. Switch off both DCEPS on the module.
	b. Remove both DCEPS.
	c. Check the voltage at the pins shown in the illustration below.
	d. If the voltage is not in the range of –48 V DC to –52 V DC, refer to *SL-1 Fault Clearing* (NTP 553-3001-510).
2	If the voltage is correct, continue with "Testing the DCEPS" on page 14-19.

Front view of module, DCEPS or CEPS removed

Ground

-48 V DC
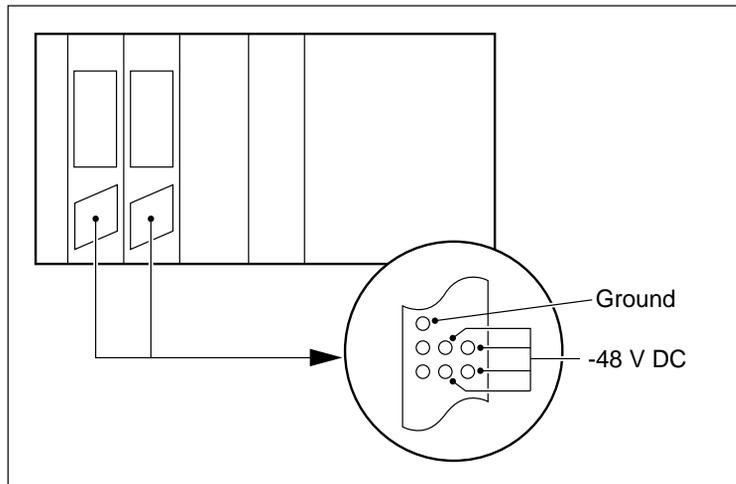
G100096

Testing the DCEPS   To test the DCEPS, follow these steps.

Step	Action
1	Power down the DCEPS if it is not already powered down.
2	Swap the DCEPS with a new one.
3	Reboot the system to full service.
4	Return the faulty DCEPS for service or replacement.
5	If the system fails to boot, see "System fails to boot completely" on page 14-21.

AC system power problems   To troubleshoot an AC power system, follow these steps.

Step	Action
1	Remove the front doors of all modules in the system.
2	If no LEDs are lit on any module above a certain module, go to the next procedure and test the pedestal power supply and power harness at the lowest module with no LEDs lit.
3	If no LEDs, including the LEDs on the CEPS, are lit on a single module or on a single side of a module, go to "Testing the CEPS" on page 14-20.
	Note: A side of a module that contains a power supply but no PCPs or disk drives will give a CEPS failure indicator.

Testing the power harness and pedestal power supply   To test the power harness and pedestal power supply, follow these steps.

Step	Action
1	Check the AC voltage at the CEPS connectors (see "Front view of module, CEPS removed" on page 14-20).
	a. Switch off both breakers on the module.
	b. Remove both CEPS.
	c. Check the voltage at the pins shown in "Front view of module, CEPS removed" on page 14-20.
	d. If the voltage is incorrect, refer to *SL-1 Fault Clearing* (NTP 553-3001-510).

Step	Action
2	If voltage is correct, continue with " Testing the CEPS" on this page

Front view of module, CEPS removed

Ground
-230 V AC
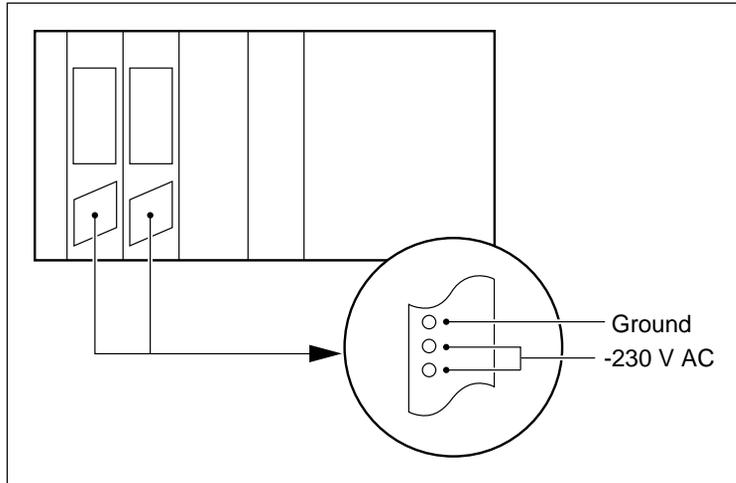
G100434

Testing the CEPS   To test the CEPS, follow these steps.

Step	Action
1	Power down the CEPS if it is not already powered down.
2	Swap the CEPS with a new one.
3	Reboot the system to full service.
4	Return the faulty CEPS for service or replacement.
5	If the system fails to boot, see "System fails to boot completely" on page 14-21.

System fails to boot completely

Introduction If the system stops during the process of booting up, refer to "Bootup stages" on page 14-6 to determine at which stage of the bootup the problem occurred. Determining the stage at which the boot process stopped will help you identify the cause of the problem.

Check cables and terminal Before troubleshooting the bootup, verify that the problem does not involve simple cabling errors or the terminal. Check that

- PCP installation and cabling conforms to the guidelines in Chapter 7 (there are no loose or improperly installed cards or cables)
- there are no problems with the terminal (refer to "Troubleshooting terminal problems" on page 14-12)

Stage of bootup process If you have already completed the cable and terminal checks and found no problems, then you must determine at which stage of the bootup the system is stopping. It is easier to determine where the bootup has stopped if you print out a hard copy of the bootup sequence as described in "Printing a hard copy of the bootup sequence" on page 14-5.

Once you have determined which stage the system is stopping at, refer to "Troubleshooting bootup stages" on page 14-22 to find which procedure to follow.

Troubleshooting bootup stages

Introduction   After each of the following procedures, check that the system is
                                 now rebooting properly by restarting the system. If these
                                 procedures fail to correct the problem, contact your Nortel
                                 Networks support organization.

Stage	Procedure
1 or 2	"Troubleshooting stage 1 or 2 bootup failure" below
3	"Troubleshooting stage 3 bootup failure—disk subsystem check" on page 14-23
4	"Troubleshooting stage 4 bootup failure" on page 14-24
5, 6, or 7	"Troubleshooting stage 5, 6, or 7 bootup failure" on page 14-24
8	"Troubleshooting stage 8 bootup failure" on page 14-24
9	"Troubleshooting stage 9 bootup failure" on page 14-25
10	"Troubleshooting stage 10 bootup failure" on page 14-25
11	"Troubleshooting stage 11 bootup failure" on page 14-26
12	Check the SEERs output. Follow the actions suggested in the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).

Troubleshooting stage   If the terminal output stopped at stage 1 after the message
1 or 2 bootup failure   "Time C tick OK," but before the message "Enabling
                                 Instruction Cache," or in stage 2 during the "BTGA tests...,"
                                 follow these steps.

Step	Action
1	Replace the high availability bus controller (HABC) card.
2	Replace the Enhanced MMP40 (or MMP40) card.

Step	Action
3	Check for Meridian Mail power problems as described in "Power problems" on page 14-15 "DC system power problems" on page 14-15 "Testing the pedestal power supply" on page 14-16 "Testing the power harness" on page 14-18 "Testing the DCEPS" on page 14-19
4	Check that the PCP switch settings are as described in Chapter 8.
5	Verify that all cards in the system are properly seated.
6	If the terminal output has stopped at some other point in the procedure, do the following: a. Replace the Enhanced MMP40 (or MMP40) card. b. Check for Meridian Mail power problems as described in "Power problems" on page 14-15 "DC system power problems" on page 14-15 "Testing the pedestal power supply" on page 14-16 "Testing the power harness" on page 14-18 "Testing the DCEPS" on page 14-19 c. Replace the HABC card.

Troubleshooting stage 3 bootup failure—disk subsystem check

Failure during this stage of bootup can indicate problems with the SCSI subsystem. Follow these steps.

Step	Action
1	Ensure that an incorrect Install/data tape has not been mistakenly left in the tape drive.
2	Check the SCSI cable installation, especially the connection to the backplane, and the jumper settings. Refer to the disk drive figures in Chapter 6.
3	Check the voltage to disk and tape (+5 V, +12 V).
4	If on a non-prime node, replace the Enhanced MMP40 (or MMP40) board.
5	Replace the disk as described in Chapter 6.

Troubleshooting stage 4 bootup failure

A bootup failure at this point can indicate that the system can initialize the SCSI disk but not boot from it. Follow these steps.

Step	Action
1	Perform the checks in "Troubleshooting stage 3 bootup failure—disk subsystem check" on page 14-23.
2	Check that the SCSI devices are terminated as described in "Disk or disk/tape unit installation" on page 6-6.
3	Check that the tape drive is unterminated as described in "Replacing the tape drive" on page 16-18.
4	If the bootup display shows error messages such as bus error, this can indicate a serious problem with your SCSI disk. Contact your Nortel Networks support organization.

Troubleshooting stage 5, 6, or 7 bootup failure

Stages 5 and 6 should take up to five seconds each. Stage 7 should take up to two minutes. A bootup failure at this point can indicate that the Mail programs have been read incorrectly from the disk, or the actual program on the disk is incorrect or corrupted. Follow these steps.

Step	Action
1	Attempt to reboot the system. If the problem persists (the bootup fails at the same point), this could indicate a serious problem with your SCSI disk.
2	Contact your Nortel Networks support organization.

Troubleshooting stage 8 bootup failure

To troubleshoot stage 8 bootup failure, follow these steps.

Step	Action
1	Check the terminal output during this stage.
2	If there is indication that the PRM failed to load, contact your Nortel Networks support organization.

Troubleshooting stage 9 bootup failure

To troubleshoot stage 9 bootup failure, follow these steps.

Step	Action
1	Check the terminal output during this stage.
2	If there is indication that SEERs may be lost, power down the system and power it back up to reset the system.
3	If the system has multiple nodes and the output indicates that some of the non-prime nodes are not responding, check the power supply for those nodes.
4	Power the system down, then power it back up to reset the system. If the boot still fails at the same point, replace the Enhanced MMP40 (or MMP40) cards of the affected nodes.
5	If the problem occurs on all the remote nodes, perform the system bus diagnostics (" Diagnosing system bus problems" on page 14-27).

Troubleshooting stage 10 bootup failure

This stage should normally take approximately five minutes. However, on a multinode system, if a remote node is having problems booting up, then this state can take as long as 20 minutes. Follow these steps.

Step	Action
1	Check the SEER output from the printer for problems with remote nodes.
2	If one or more remote nodes (but not all) are having problems, then power down and up to reset the system.
3	If the problem persists, replace the Enhanced MMP40 (or MMP40) cards of the affected nodes.
4	If the problem is occurring on all nodes, follow "Diagnosing system bus problems" on page 14-27.

Troubleshooting stage 11 bootup failure   If the bootup fails during this stage, follow these steps.

Step	Action
1	Check the SEERS for problems when loading programs. If you see any such SEERs, follow the actions suggested in the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).
2	Observe the terminal output during stages 7, 8, and 9 for any indications that node 1 is not InService. If there are indications that node 1 is not InService, contact your Nortel Networks support organization.
3	If Node 1 is InService but the system will not progress past stage 10, proceed as follows: a. Replace the Enhanced MMP40 (or MMP40) card in Node 1. b. Check for Meridian Mail power problems as described in "Power problems" on page 14-15 "DC system power problems" on page 14-15 "Testing the pedestal power supply" on page 14-16 "Testing the power harness" on page 14-18 "Testing the DCEPS" on page 14-19. c. If the problem is occurring on all nodes, follow "Diagnosing system bus problems" on page 14-27.

System bus diagnostics and fault clearing

Diagnosing system bus problems

The Meridian Mail system bus is controlled by the high availability bus controller (HABC) located in node 1 of a multi-node system. A fault on the system bus can cause all communication between nodes to be lost. If you suspect a system bus problem, follow these steps.

Step	Action
1	Check the switch settings for all PCPs. Refer to Chapter 8.
2	If the HABC card diagnostics were run, ensure that the diagnostics passed. If they did not pass, replace the HABC.
3	Verify that the cabling between shelves is correct and secure.
4	Verify that all cards in the system are properly seated.
5	Verify the bus terminators installed on the HABC card of the last node in the system.
6	Observe the BootROM diagnostics messages on node 1. a. If the Tap Register Test or the Tap Dataline Test fails or does not appear in the BootROM messages, replace the HABC. b. If the problem persists, replace the Enhanced MMP40 (or MMP40).
7	Replace the HABC.
8	Restart the system.

Clearing system configuration faults

To clear system configuration faults, follow these steps.

Step	Action
1	Check the switch settings on all printed circuit packs on the node.
2	Verify the switch settings on the Enhanced MMP40 (or MMP40).

Step	Action
3	Replace the Enhanced MMP40 (or MMP40) card.
4	Verify the proper connection of terminators on multi-node systems at each end of the ribbon cable bus.
	Note: The HABC card has a fuse that may blow if a terminator or cable (at HABC and Enhanced MMP40 [or MMP40] last node) is defective.
5	Replace the bus terminators.

No SCSI addresses during bootup

No SCSI address 0 during bootup of Meridian Mail

If the system will not boot up from the disk drive, follow these steps.

Step	Action
1	With the power on, verify the voltages on TB1. See "DC voltage at TB1" on page 14-30 and "Location of terminal block TB1," below, for the correct voltages relative to ground.

Location of terminal block TB1
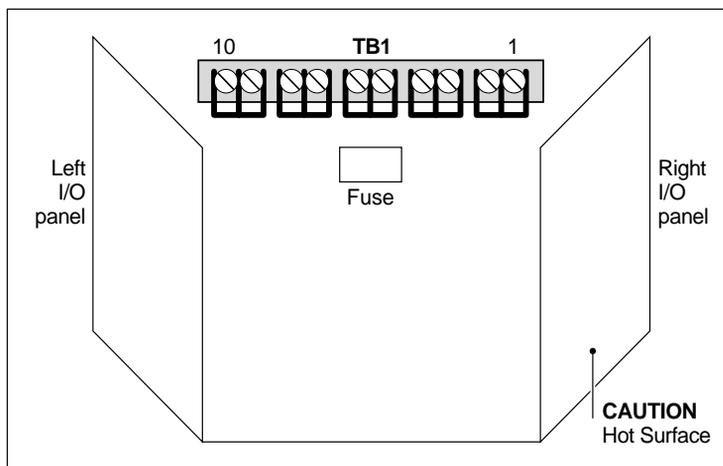
G100167

Step	Action
2	Power the system down.
3	Reseat the power supplies if the voltages are not correct on TB1.
4	If the voltages are still not correct, the power supplies may be defective. Verify this by substituting new power supplies.
5	Reseat the disk, tape, and disk/tape drive packs.
6	Verify that the SCSI cable between the disk drive and the connector at the back of the MSU cage is securely connected at both ends.
	If you suspect the SCSI cable is defective, substitute another disk drive pack.

DC voltage at TB1

Pin 1	–48 V N/A	Pin 6	0 V
Pin 2	–48 V N/A	Pin 7	+12 V
Pin 3	0 V	Pin 8	+12 V
Pin 4	0 V	Pin 9	+5 V
Pin 5	0 V	Pin 10	+5 V

7   In an unshadowed prime node, swap the disk drive pack with the tape drive pack.

The disk drive is normally installed beside the power supplies. The tape drive is normally installed to the right of the disk drive.

Note: The power supply on the left powers the disk and the printed circuit packs. The power supply on the right powers the tape drive.

8   If the TB1 voltages are correct and the disk drive does not work in either slot, but the tape drive does work in both MSU slots, suspect a defective disk drive. Replace the drive.

9   If the tape drive does not work in the disk drive MSU slot, then suspect an out-of-alignment connector or a defective backplane connector. Replace as required.

No SCSI address 1 during bootup of Meridian Mail

When there is no SCSI address 1 during the bootup of Meridian Mail, follow these steps.

Step   Action

1   With the power on, verify the voltages on TB1. See the table above, and "Location of terminal block TB1" on page 14-29 to verify the DC voltages.

2   Power the system down.

3   Reseat the power supplies if the voltages are not correct on TB1.

4   If the voltages are still not correct, the power supplies may be defective. Verify this by substituting new power supplies.

Step	Action
5	Reseat the tape or disk/tape drive pack, ensuring that it is firmly seated.
6	Verify that the SCSI cable between the tape drive and the connector at the back of the MSU cage is securely attached at both ends.
7	Reseat the tape drive pack and ensure it is firmly seated.
8	In an unshadowed prime node, swap the tape drive pack with the disk drive pack. The tape drive is normally installed to the right of the disk drive. The disk drive is normally installed beside the power supplies. *Note:* The power supply on the left powers the disk and the printed circuit packs. The power supply on the right powers the tape drive.
9	If the TB1 voltages are correct and the tape drive does not work in either slot, but the disk drive does work in both MSU slots, suspect a defective tape drive pack. Replace the drive.
10	If the disk drive does not work in the tape drive MSU slot, suspect an out-of-alignment connector or a defective backplane connector. Replace as required.

No SCSI address 2 during bootup of Meridian Mail

When there is no SCSI address 2 during the bootup of Meridian Mail, follow these steps.

Note: This procedure applies only to shadowed systems and should be performed when the system will not boot up from the disk drive.

Step	Action
1	With the power on, verify the voltages on TB1. See "DC voltage at TB1" on page 14-30 and "Location of terminal block TB1" on page 14-29 to verify the voltages.
2	Power the system down.
3	Reseat the power supplies if the voltages are not correct on TB1.
4	If the voltages are still not correct, the power supplies may be defective. Verify this by substituting new power supplies.
5	Reseat the disk drive pack, ensuring that it is firmly seated.

Step	Action
6	Verify that the SCSI cable between the disk drive and the connector at the back of the MSU cage is secure to the disk from the disk drive pack connector. If you suspect the SCSI cable is defective, substitute another disk drive pack.
7	Swap the primary and secondary disk drive packs. ***Note 1:*** The power supply on the left powers the primary disk and the printed circuit packs. The power supply on the right powers the secondary disk. ***Note 2:*** The primary disk drive is normally installed beside the power supplies. The secondary disk drive is normally installed to the right of the primary disk drive. In the first node, the secondary disk drive is replaced by a disk/tape assembly.
8	Power the system on.
9	If the TB1 voltages are correct and one disk drive does not work in either slot, but the other drive does work in both MSU slots, suspect a defective disk drive. Replace the drive.
10	If neither drive works in one MSU slot but both drives work in the other MSU slot, suspect an out-of-alignment connector or a defective backplane connector. Replace as required.

Chapter 15

Troubleshooting operational problems

In this chapter

Overview

Introduction   This chapter contains troubleshooting information for some problems that can occur on a system that has successfully booted up. That is, the system is powered on, all the diagnostics are completed successfully, and the Logon screen appears on the administration terminal.

Find the description of your problem in the following table, then refer to the procedures. If the system is producing SEERs related to your problem, you should also refer to the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510). If you cannot resolve the problem, contact your Nortel Networks support organization.

Troubleshooting operational problems   When you are troubleshooting operational problems, refer to the following table.

Operational problems and related procedures
System-level problems
"System running, then goes down" on page 15-4
"System status remains FAULTY" on page 15-4
"'Service is unavailable' when calling Meridian Mail" on page 15-5
AML (ISDN/AP) link problems
"System status shows Faulty link to PBX" on page 15-7
Voice card/channel problems
"Channel status is faulty or out of service" on page 15-8
"Channel status remains Loading" on page 15-9
"Silent channel—calls have no voice and produce a SEER" on page 15-9
"Silent channel—calls have no voice and do not produce a SEER" on page 15-11
"Channel status IDLE, but cannot be acquired" on page 15-11
Administration problems
"Terminal responds yet logon is unsuccessful" on page 15-12
"Optional feature purchased but unavailable" on page 15-12
"Voice services—submenu revert DN does not work" on page 15-13
"Problems backing up the system (disk to tape or tape to disk)" on page 15-13

Operational problems and related procedures
User-reported problems
"Recovery from user hearing 'Your mailbox is full…your mailbox is empty' after a node has been rebooted" on page 15-14
"Message Waiting Indicator (MWI) does not light on any telephone sets" on page 15-14
"Message Waiting Indication is delayed" on page 15-15
"Call Sender does not work for any calls" on page 15-16
"Revert DN does not work" on page 15-17

System-level problems

System running, then goes down

When the system is running normally and then goes down for no apparent reason, follow these steps.

Step	Action
1	Check your SEER printouts.
	SEERs can indicate a combination of problems (that is, more than one SEER is printed). If the system goes down as a result of a CEPS problem, the SEERs will indicate the OFS program crashing.
2	Power the system off, wait 90 seconds, and then power on again.
	Observe the diagnostic messages that generate (from BootROM) on the administration terminal.
3	If the diagnostics fail, replace the Enhanced MMP40 (or MMP40) card.
4	If the system reboots with no hardware faults but remains out of service, refer to the SEERs to identify operational problems.

System status remains FAULTY

Your administration terminal indicates that the system status is FAULTY despite a successful bootup. If the FAULTY status occurs during bootup, refer to the previous chapter.

Step	Action
1	Check the SEER printout for related messages.
	Take action appropriate for the SEER message as described in *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).
	If the SEERS indicate digital signal processor (DSP) driver problems, verify the network cable is secure. For subsequent troubleshooting, replace the network loop cable, then replace the Voice Processor pack.
2	Courtesy down the system, then activate the system.
	Refer to the *Meridian Mail System Administration Guide* (NTP 555-7001-30x) for instructions on how to courtesy down and restart the system.
3	Verify that the cabling from the MSDL/ESDI card to Meridian Mail is connected and secured to the correct MSDL/ESDI port.

Step	Action
4	Verify the correct database programming for the MSDL/ESDI dataport in Meridian Mail. Refer to Chapter 10 for AML hardware setup, Chapter 12 for AML programming, and Chapter 18 for AML maintenance commands.
5	Determine if any nodes show Faulty or OutOfService status. If any nodes show either status, follow the fault clearing procedures for the following components: • card cage problems • system fails to boot completely • disk subsystem check • no SCSI address 0, 1, or 2
6	Determine if any of the voice cards show Faulty or OutOfService status. If a voice card shows either status, do the following: a. Disable the card. For detailed instructions on disabling the card, refer to your *System Administration Guide*. b. Perform OutOfService diagnostics. c. Reenable the card.

'Service is unavailable' when calling Meridian Mail

If the system has booted up and appears to be running normally, but there is no connection to Meridian Mail when you try to place a call, follow these steps.

Step	Action
1	Check that the Meridian 1 has been properly configured (refer to Chapter 12, "Configuring the Meridian 1").
2	Verify that the Meridian Mail DN is properly configured in the VSDN table. See your *System Administration Guide* for configuration details.
3	Check that the AML is up on the Meridian 1 (link status) by checking Overlay 48, AML status.
4	Verify that the primary DN in the Meridian Mail Channel Allocation Table (CAT) matches the Main ACD Queue DN in the Meridian 1.
5	Make sure the VASID in the Main ACD Queue DN matches the VASID in the Meridian 1 Configuration Record.

Step	Action
6	Verify that each service enabled on your system has the appropriate greeting and menu choices greeting recorded.
7	Verify that each Time of Day controller, Menu Service, Thru Dial, and Announcement Service has the correct service IDs.
8	Check the SEERs for any operational problems.

AML (ISDN/AP) problems

System status shows Faulty link to PBX

When the system status shows "Faulty link to PBX," follow these steps.

Step	Action
1	Ensure that the AML (ISDN/AP) cable is in place and secure.
2	Check that the Meridian 1 has been properly configured. Refer to Chapter 10 for AML hardware setup, Chapter 12 for AML programming, and Chapter 18 for AML maintenance commands.
3	Check other hardware addressing, such as SDI ports or D-channel ports, to ensure they are not assigned the same hardware address as the MSDL/ESDI ports.
4	Make sure the MSDL switch settings or ESDI switch settings and card option plugs are installed in the correct locations.
5	Program the unassigned port of the ESDI card in the Meridian 1 configuration record, and perform the self-test as outlined in Overlay 48. See the *X11 Input Output Guide* (NTP 553-3001-400). ***Note:*** The MSDL requires the self-test only. • Disable the MSDL/ESDI port. • Perform Autoset for the MSDL/ESDI port.
6	Check the Meridian 1 to make sure traffic is flowing by placing a phone call to Meridian Mail and watching the channel status on the System Status screen or the DSP Port Status screen.

Voice card/channel problems

Channel status is faulty or out of service   When the channel status is "faulty" or "out of service," follow these steps.

Step	Action
1	Check the network loop cable connections along the network loop path from the backplane of Meridian Mail to the QPC414 in the Meridian 1.
2	Check the jumper board on the backplane to make sure it is secure.
3	Ensure that the voice cards in the correct node are properly seated. ***Note:*** The term "voice card" in this procedure refers to NVP cards.
4	Verify the database in Meridian 1 and the Channel Allocation Table (CAT).
5	Check the DTA100 code on the Meridian 1.
6	Check the status of agents in Meridian 1 (in Overlay 32). See the *X11 Input Output Guide*. a. **STAT L S C U** (L=loop, S=shelf, C=card, U=unit). b. Verify that each unit shows IDLE (log-in). c. If each unit does not show IDLE, **DIS L S C U** (disable loop, shelf, card, and unit). d. **ENL L S C U** (enable loop, shelf, card, and unit). ***Note 1:*** You should see a DTA101 message if the agent was disabled. ***Note 2:*** For any error messages received during this process, refer to the *X11 Input/Output Guide* (NTP 555-3001-400) for the appropriate action.
7	Disable each voice card and perform out-of-service diagnostics on each card. Replace the voice card if the diagnostics fail. See the *System Administration Guide* (NTP 555-7001-30x) for details.
8	Check the SEER printout for any VSS load errors for that particular channel. a. **STAT L S C U**

Step	Action
9	Check the SEER printout for any driver fault messages (software messages) for that channel. Refer to *the Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510) for interpretation of these SEERs, and take corrective measures.
	If VPH complains about too many driver restarts for a particular channel, simply disable and then reenable that channel.
10	Replace the voice card.

Channel status remains Loading

When the channel status remains Loading, follow these steps.

Step	Action
1	Verify that the Meridian Mail channel has a corresponding ACD agent programmed in the Meridian 1.
2	Verify that the Network loop voice cable is connected properly on both the Meridian Mail and Meridian 1.
3	The Channel Allocation Table data must match the SCN DN on KEY 1 of each ACD agent as follows:

Meridian Mail	Meridian 1 configuration
Primary (Voice Messaging) DN	Primary ACD queue
Routing Address	ACD agent TN
Channel DN	Agent SCN

Silent channel—calls have no voice and produce a SEER

When you have calls that have no voice and produce a SEER, follow these steps.

Step	Action
1	Check that the network loop cable terminator is installed. Refer to Chapter 10.
2	Check the status of channels by placing a call and watching the status of the channel on the Meridian Mail administration terminal at the System Status screen or DSP Port Status screen.
3	Load Overlay 80 and do a call trace on the TN that is under test as outlined in the *X11 Input/Output Guide* (NTP 553-3001-400).

Step	Action

4   If the result shows the channel being acquired, verify that the network loop cable from Meridian Mail to the Meridian 1 is securely attached at both ends. If it is, check the SEER printout for any messages related to that channel, and take the appropriate action for that SEER.

5   Make sure that Meridian Mail has been configured with valid TNs and DNs by checking the CAT table. See your System Administration Guide.

    a. If the CAT is incorrect, disable the card as described in your *System Administration Guide*.

    b. Log in to the TOOLS utility level and use the Hardware Administration utility to modify the TNs accordingly.

    c. Change the DNs in the CAT table.

    d. Perform OutOfService diagnostics and reenable the channels. Refer to your system administration guide.

6   Ensure that each network loop is configured on the Meridian 1 by performing loop diagnostics in LD 30. Refer to the *X11 Input/Output Guide* (NTP 555-3001-400).

7   Disable the voice cards.

    a. Reseat the voice cards.

    b. Perform Out-of-Service diagnostics.

    c. Reenable the voice cards.

8   Disable and unseat the QPC414 in the Meridian 1.

    Note: This step will suspend call processing. It is not recommended during peak business hours.

    a. Reseat the QPC414.

    b. Reenable the QPC414.

    c. Initialize the Meridian 1.

9   Replace the network loop cable.

10   Replace the voice card.

11   If these procedures are unsuccessful, contact your Nortel Networks support organization.

Silent channel—calls have no voice and do not produce a SEER

When you have calls that have no voice and do not produce a SEER, follow these steps.

Step	Action
1	Determine if ERR 3036 or ERR 3037 occur on the Meridian 1.
	If there is no change, replace the network loop cable, the network card, or both.
2	If a new network loop was assigned for Meridian Mail in the Meridian 1 configuration record, make sure that the Meridian 1 was manually initialized.
3	If these procedures are unsuccessful, contact your Nortel Networks support organization.

Channel status IDLE, but cannot be acquired

When the channel status is IDLE but cannot be acquired, follow these steps.

Step	Action
1	Check the status of the channels.
2	Check the SEER printout for messages related to that channel.
3	Take the appropriate action for that SEER.
4	Disable, then reenable the channel on the Meridian 1.
5	Verify that the network cable is connected to the assigned port.
6	Verify that the VASID in the Meridian 1 configuration record matches the VASID in the Main Meridian Mail ACD queue.
7	Verify correct data entry for the VSDN table and for the Channel Allocation Table. See your *System Administration Guide* for details.
	Note: If these procedures are unsuccessful, record detailed information and contact your Nortel Networks support organization.

Administration problems

Introduction

Verify that the local administration terminal, printer, modem, and remote administration terminal are all set up correctly according to Chapter 11.

See "Troubleshooting terminal problems" on page 14-12.

Terminal responds yet logon is unsuccessful

If the logon is unsuccessful, follow these steps.

Step	Action
1	Check that you are entering the correct password.
2	Check that the timestamp has been received by Meridian Mail. a. Check the latest SEER for the timestamp. b. Load Overlay 2 in the Meridian 1, issue a TTAD command, and verify that the timestamp has the current time. c. If the timestamp is not accurate, set the time in Meridian 1 by using the STAD command. Refer to the *X11 Input/Output Guide* (NTP 553-3001-400).
3	If this is your fourth failed logon attempt, wait ten minutes before trying again.

Optional feature purchased but unavailable

When an optional feature is unavailable, follow these steps.

Step	Action
1	Verify the installed features from the General System Administration.
2	If the feature is not present, attempt to add it from the Install/ data tape.
3	Check the SEER printout for any incorrect data entries such as keycode number or serial number. If the keycode is not correct, contact your Nortel Networks support organization to obtain the correct keycode.
4	Verify that the features were ordered correctly.

Voice services—submenu revert DN does not work

Submenus revert to their parent menus. However, you can force a submenu to revert to a specific DN by programming the delayed response and initial no-response for the submenu as a calling function (CL) to the intended revert DN.

Problems backing up the system (disk to tape or tape to disk)

To correct problems with backing up, follow these steps.

Step	Action
1	Ensure that you are using the correct disk or tape for backup.
	Not all disks and tapes are appropriate for all system configurations. See your *System Administration Guide* (NTP 555-7001-30x) for details. Additional units can be purchased from your Nortel Networks sales representative. If you do not receive tapes with a new system, contact your sales representative.
2	Examine SEER printouts for information on where the error is occurring.
	Consult the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510) for each relevant SEER and the appropriate action.
3	Verify that the DC voltage is correct at the DCEPS connectors.
4	Verify that all SCSI cable connections are secure.
5	Ensure that the tape drive or disk drive is securely seated and is installed in the correct MSU slot. Refer to Chapter 6, "Inspecting and installing the power supplies and mass storage units," for slot designations.
6	Replace the tape unit.
7	If the backup was unsuccessful, substitute a replacement tape drive or disk drive, and attempt the backup again.
	Note: Verify that the full or partial backup was successful before system cutover.

User-reported problems

Recovery from user hearing 'Your mailbox is full…your mailbox is empty' after a node has been rebooted

If a user node is shut down without being disabled first (for example, due to an unexpected loss of power), user disk space usage may be incorrect. When the node comes back up, some users may hear the prompt, "Your mailbox is full…your mailbox is empty" when logging in to their mailboxes.

To recover, follow this step.

Step	Action
1	Run the VS audit to correct the disk space usage information.
	a. If the problem is widespread or urgent and the extra load on the system can be tolerated, run the audit immediately.
	b. If the problem is not widespread or urgent, run the audit during non-busy hours.
	c. If it is possible to keep the node OutOfService after it is restarted, run the audit before bringing the node back into service. This will avoid this problem.
	Note: Refer to the *Meridian Mail System Administration Tools* (NTP 555-7001-305) for detailed instructions on running an audit.
	Note: The audit is automatically scheduled nightly so the problem will be cleared, without manual intervention, by the next day.

Message Waiting Indicator (MWI) does not light on any telephone sets

When the MWI does not light on any telephone sets, follow these steps.

Step	Action
1	Verify that the customer number on the Meridian Mail matches the customer number on the Meridian 1.
2	If they do not match, modify the customer number in the general system configuration.
3	Ensure that all Meridian Mail users have Message Waiting Allowed class of service configured for their telephone sets.

Step	Action
4	Check the user profile in User Administration for Message Notification.
	Note: Refer to your *System Administration Guide*.

Message Waiting Indication is delayed

When the MWI is delayed, follow these steps.

Step	Action
1	Ensure that the CSQI and CSQO prompts in the Meridian 1 configuration record are set to 25 percent of the Meridian 1 call registers.
	See Chapter 10 for details. The Meridian 1 must be initialized after changing these prompts.
2	Check the AML (ISDN/AP). Refer to Chapter 10 for AML hardware setup, Chapter 12 for AML programming, and Chapter 18 for AML maintenance commands.
3	Review the Meridian 1 history file for HDLC restarts or CSL outages that result in MWI messages being lost between Meridian Mail and the Meridian 1.
4	Increase the user's storage limit if the limit is exceeded frequently and the user is complaining of delayed messages.
5	Send a broadcast message and verify that all users receive MWI.
6	Run the set MWI utility from the Tools level and verify that all users receive MWI. Refer to *Meridian Mail System Administration Tools* (NTP 555-7001-305).
7	If an interrupted dial tone is used for MWI notification, ensure there are sufficient digitone receiver (DTR) resources on the Meridian 1.
	Meridian 1 traffic reports can be used as a tool to verify insufficient DTR resources.

Call Sender does not work for any calls

When the Call Sender does not work for any calls, follow these steps.

Step	Action
1	Confirm that the customer number in the "System General Options" screen (under General System Administration) matches the customer number on the Meridian 1.
	If the number does not match, edit the customer number on Meridian Mail.
2	Verify that the sender DN is valid. Check any restrictions that may apply. See "Class of service administration" in your System Administration Guide.
3	Verify that the Meridian Mail ACD agents have Transfer (TRN) and Conference (A03) programmed on the correct keys (6 and 7, respectively).
	Check the configuration against Chapter 12 of this manual.
4	Verify that all Meridian Mail users have a Conference (A03 or A06) key programmed for their telephone sets.
5	Verify correct programming of the Meridian Mail Channel Allocation Table (CAT).
6	Verify that the Call Sender is a valid DN that can be called by the Meridian Mail agents.
	a. Open the user's profile.
	b. Move the cursor to the "Personal Verification Recorded" field.
	c. Press the [Voice] softkey.
	d. When the system prompts you for the DN, enter the Call Sender DN that is being tested.
	e. If the call is unsuccessful, check Meridian 1 and Meridian Mail databases for dialing restrictions.

Revert DN does not work

When the revert DN does not work, follow these steps.

Step	Action
1	Verify that the Meridian Mail ACD agents have Transfer (TRN) programmed on key 6. Check the configuration against Chapter 12.
2	Verify that a Night Call Forward (NCFW) DN has been programmed in the ACD queue for Meridian Mail.
3	Verify that the correct revert DN appears in the user mailbox profile. Use the Modify User command to check the mailbox setup.
4	Verify that the user is correctly performing the custom revert feature. Refer to the *Meridian Mail User Guide*.
5	Verify that the revert DN is a valid DN that can be called by the Meridian Mail agents.

    a. Open the user's profile.

    b. Move the cursor to the "Personal Verification Recorded" field.

    c. Press the [Voice] softkey.

    d. When the system prompts you for the DN, enter the revert DN that is being tested.

    e. If the call is unsuccessful, check the Meridian 1 and Meridian Mail databases for dialing restrictions.

Chapter 16

Hardware maintenance

In this chapter

Overview

Introduction   This section provides procedures for the following:

- power supply replacement
- printed circuit pack (PCP) replacement
- disk unit replacement
- enabling and disabling disk shadowing
- tape drive assembly replacement
- tape drive maintenance

<table>
<tr><td>⚠️</td><td>

CAUTION

Risk of equipment damage

Disconnect power from the Meridian Mail module before removing any components. The PCPs and other components are not designed for insertion with the power on (hot insertion).

Shut off the power to the Meridian Mail shelf using the circuit breakers (AC system) or the switches on the power supplies (DC system). See "Location of CEPS—AC system" and "Location of DCEPS—DC system" on page 16-4.

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<tr><td>⚠️</td><td>

CAUTION

Risk of equipment damage

The PCPs and other components are susceptible to static damage. Wear an antistatic wrist strap connected to a grounding point.

Disk units are also susceptible to damage from rough handling.

</td></tr>
</table>

If you need to perform maintenance on a working system, courtesy-down the system before taking it out of service. For more information on courtesy-down procedures, refer to the *System Administration Guide* (NTP 555-7001-30x).

Power supply removal and replacement

Location of CEPS—AC system

G100160

Location of DCEPS— DC system

G100158

Removing and replacing a power supply

To remove and replace a power supply, follow these steps.

Note: See the handling precautions at the beginning of the chapter.

Step	Action
1	Power off the affected module.
2	Pull out the power supply unit to be replaced.

Step	Action
3	Insert the replacement unit and lock it in place.
4	Before turning the power back on, make sure the packs are securely locked in place and no other components have been disturbed.
5	Turn the power back on at the power supply switches.

Printed circuit packs

Introduction   The following printed circuit packs (PCPs) are used in Meridian Mail:

- Meridian Mail Processor 68040 (Enhanced MMP40) single board computer
- network voice processor (NVP)
- high availability bus controller (HABC) on prime node of systems with multiple nodes
- RS-232 service module (RSM)

Refer to Chapter 8 for switch and jumper locations and settings for the PCPs, and for an explanation of which packs belong in which slots.

The printed circuit pack slot positions are shown in the following illustration.

Printed circuit pack positions
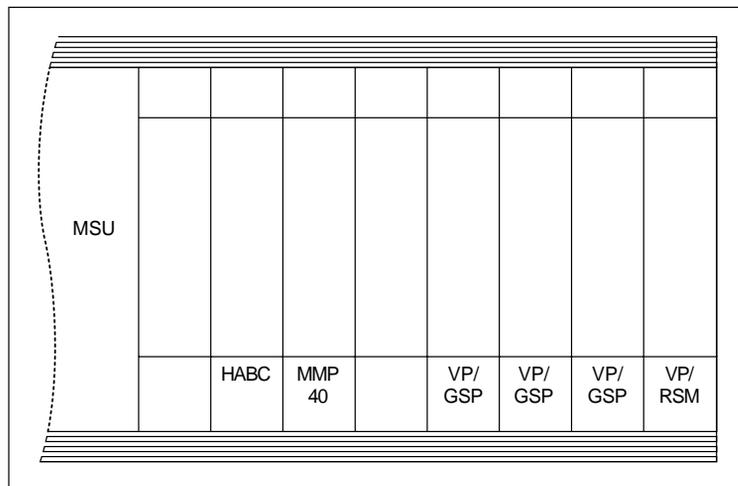
G100157

Removing and replacing a PCP

To remove and replace a PCP, follow these steps.

Note: See the handling precautions at the beginning of the chapter.

Step	Action
1	Power off the affected module.
2	Disconnect the cables attached to the fronts of packs as needed.
3	Use the card ejectors to remove each PCP to be replaced or checked. The designation strip at the bottom rail of the shelf identifies the locations of each pack. Circuit pack locations depend on system size.
4	Verify the switch and jumper settings on the replacement PCP. See Chapter 8 for switch and jumper locations and settings for the PCPs.
5	Slide the replacement PCP into the correct slot and lock the ejectors.
6	Reconnect any cables you disconnected.

Disk or disk/tape units

Replacing a disk unit in an unshadowed node

To replace a disk unit in an unshadowed node, follow these steps.

Note: See the handling precautions at the beginning of the chapter.

Step	Action
1	Power off the affected module.
2	Remove the tape or disk/tape unit by opening the ejectors and then carefully sliding the unit out.
3	Ensure that the replacement unit has the same part number, including suffix, as the one on your packing slip.
4	Verify the jumper settings and placement or removal of terminators on the replacement disk drive (see Chapter 5 of this manual). If the disk being replaced is on the prime node, see "Replacing the tape drive" on page 16-18.
5	Carefully slide the replacement unit in, and lock the ejectors in place.

Replacing a primary (left side) disk or disk/ tape unit in a shadowed system

To replace a primary (left side) disk or disk/tape unit, follow these steps.

Note: See the handling precautions at the beginning of the chapter.

Step	Action
1	Disable disk shadowing (see "Enabling/disabling disk shadowing" on page 13-11).
2	Power off the affected module.
3	Ensure the new primary disk or disk/tape unit has the same part number, including suffix, as the one shown on the packing slip.
4	Verify the jumper settings and placement or removal of terminators on the replacement disk drive and/or tape drive (see Chapter 5 of this manual), *but* address the new primary disk as SCSI ID=0.

Step	Action
5	Install the unit in the prime disk location (the same MSU slot as the disk you are replacing) by carefully sliding the unit in and locking the ejectors in place.
6	Reboot the system.
7	Synchronize the disks. Refer to the *Meridian Mail System Administration Guide* (NTP 555-7001-30x).

Replacing a secondary disk or disk/tape unit in a shadowed system

To replace a secondary disk or disk/tape unit in a shadowed system, follow these steps.

Step	Action
1	Disable disk shadowing (see "Enabling/disabling disk shadowing" on page 13-11).
2	Power off the affected module.
3	Remove the disk unit by opening the ejectors and then carefully sliding the unit out.
4	Ensure the new disk unit has the same part number, including suffix, as the one shown on the packing slip.
5	Verify the jumper settings and removal of terminators on the replacement disk drive (see Chapter 6).
6	If this is the prime node, see "Replacing the tape drive" on page 16-18 for tape drive jumpers and terminators.
7	Install the disk in the same MSU slot as the disk you are replacing by carefully sliding the unit in and locking the ejectors in place.
8	Reboot the system.
9	Synchronize the disks. Refer to the *Meridian Mail System Administration Guide* (NTP 555-7001-30x).

Tape drive units

Introduction

The tape unit used with Meridian Mail Options is either the high-density Tandberg (TDC4220) tape drive assembly or the Archive (Viper) tape drive assembly (NT4R28AC).

Nortel Networks ships the appropriate backup tape with the tape drive assembly. The following table lists some of the backup tapes.

Tape media

CPC code	Tape
A0369779	DC6150 backup tape
A0368760	DC6250 backup tape
A0630697	2.5-Gbyte Magnus backup tape

> **CAUTION**
> **Risk of data errors**
>
> If you are using the DC6250 tape media, do not revert back to the DC6150 media, as this may cause data errors when reading from the tape.

Tape drive maintenance

Preventive maintenance of the tape drive involves periodic cleaning after every four to six hours of use. To ensure reliable tape drive performance, establish a regular cleaning schedule and observe the following precautions:

- Maintain a clean, dust-free environment within the temperature and humidity limits listed in the specifications of the Meridian Mail system.
- Keep all liquids away from the drive and tapes to prevent spills into the equipment.
- Exercise reasonable care when using and storing tape cartridges. Do not place cartridges on the Meridian Mail or Meridian 1 cabinets or on the monitor of the system administrator's terminal.

- When a stored tape is moved to an environment with a greatly different temperature, allow the tape to slowly reach room temperature before using it.

- Do not open the cartridge access door to touch the tape.

Cleaning the tape drive

The tape drive should be replaced when you receive repeated errors when attempting to write to tape. You should also consider replacing the tape drive if the light on the front of the tape drive is out or you cannot hear or see the tape spinning.

The tape cartridge cavity should be cleaned

- after an initial pass with a new tape cartridge

- after eight hours of normal use

- whenever dust or debris is visible inside the cartridge cavity

To clean the Archive or Tandberg tape drive, you need the following supplies:

- low-pressure aerosol air

- tapehead cleaning fluid or reagent grade chemically pure isopropyl alcohol

- tape drive cleaning kit including a tape drive cleaning cartridge *or* tapehead cleaning pads, lint-free cotton swabs, or any industry-acceptable head-cleaning swabs that are at least 15.24cm (six inches) long

Note: If you have a Tandberg tape drive, do not use "Cleaning the Archive tape drive with the cleaning kit" on page 16-12 or "Cleaning the Archive tape drive with swabs and fluid" on page 16-13, as they apply only to Archive tape drives.

Tape drive cleaning kits

Type of tape drive	Tape drive cleaning kit CPC code
Archive Viper	A0378220
Tandberg TDC 4220	A0633585

Cleaning the Archive tape drive with the cleaning kit

If you are cleaning the Archive tape drive with the cleaning kit, follow these steps. If you have a Tandberg tape drive, refer to "Cleaning the Tandberg tape drive" on page 16-14.

Step	Action
1	If there is a tape cartridge in the tape drive, remove it.
2	Push the head loading lever down into the load position.
3	Carefully blow out dust from the sensor hole and tape cartridge cavity with aerosol air.
4	Release the head loading lever.
5	Obtain the appropriate tape drive kit for your tape drive, as described in "Tape drive cleaning kits" on page 16-11.
6	Moisten the flexible pad of the cleaning cartridge with four drops of the Streaming Tape Head Cleaning Fluid.
7	Insert the cleaning cartridge into the tape drive in the same way as a normal tape cartridge and lock it into position.
8	Move the moistened pad using four strokes of the guide rod, moving the rod as far as it will go each time.
9	Remove the cleaning cartridge from the tape drive.
10	Remove the flexible pad by sliding it out of the holder. Discard the pad.
11	Insert a new, dry pad into the holder by sliding it into place.
12	Insert the cleaning cartridge into the tape drive and lock it into place.
13	Move the dry pad using four strokes of the guide rod, moving the rod as far as it will go each time.
14	Remove the cleaning cartridge. Store it with the dry pad in its original carton until the next use.

Cleaning the Archive tape drive with swabs and fluid

Use this procedure only if you have an Archive tape drive. If you have a Tandberg tape drive, refer to "Cleaning the Tandberg tape drive" on page 16-14.

Step	Action
1	If there is a tape cartridge in the tape drive, remove the cartridge.
2	Push the head loading lever down into the load position.
3	Carefully blow out dust from the sensor hole and tape cartridge cavity with aerosol air. (Refer to the following illustration.)

Archive tape drive cleaning
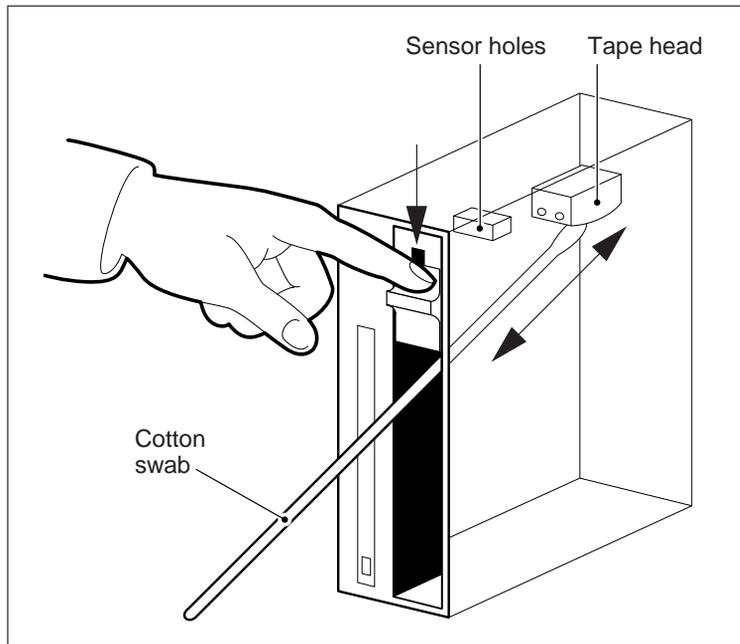
G100003

4	Moisten a pad or swab with the head-cleaning fluid until it is saturated but not dripping.
5	Carefully wipe the head in the direction that the tape travels. (Refer to the preceding illustration).

⚠	**CAUTION** **Risk of equipment damage** Do not wipe across the tape or use a circular scrubbing motion, as this can seriously damage the tape heads.

6   DIscard the used swab and repeat step 4 and step 5 with new swabs until the swab shows no signs of dirt.

7   Use a new, dry swab to remove any remaining cleaning fluid from the head.

8   Allow two minutes for the tape head to dry before inserting a tape.

9   Release the head loading lever away from the load position.

10   If there was a tape cartridge in the tape drive, reinsert it.

Cleaning the Tandberg tape drive

Follow the steps in this procedure if you are cleaning the Tandberg tape drive. If you have an Archive tape drive, refer to "Cleaning the Archive tape drive with the cleaning kit" on page 16-12 or "Cleaning the Archive tape drive with swabs and fluid" on page 16-13.

Step	Action
1	Press the release button on the tape drive (see "Tandberg tape drive" on page 16-15). The tape drive door will open.
2	If there is a tape cartridge in the tape drive, remove the cartridge.
3	Prepare the cleaning cartridge as per the manufacturer's instructions.
4	Carefully blow out dust from the tape cartridge cavity with aerosol air.
5	Insert the cleaning cartridge into the tape drive.
6	Close the door to engage the cartridge. The tape drive will start to spin.
7	After a suitable period (that is, several minutes), press the release button to disengage the cartridge.

Tandberg tape drive

Release button

LED
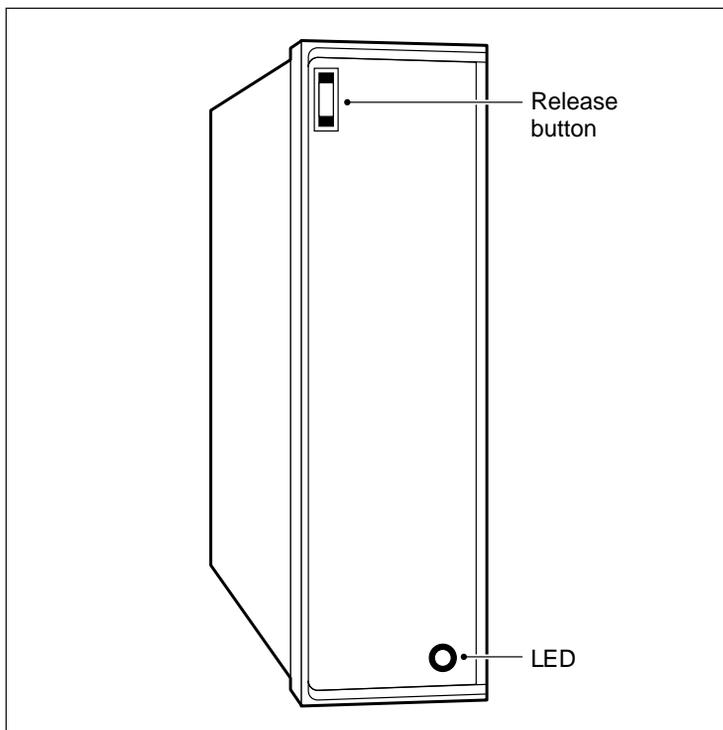
G100002

8   Remove the cartridge and store it in its original container.

The cleaning cartridge should be stored in its original container and put away until its next use.

9   Wait two minutes for the tape heads to dry before using the tape drive.

Installing the mass storage unit

Setting the SCSI ID for the Archive tape drive

When setting the SCSI ID for the Archive tape drive, follow these steps.

Step	Action
1	Find the 3-by-6 header beside the SCSI connector. See "Mass storage unit (MSU) (NT4R28AC—Archive Viper tape drive)" on page 16-19 and "Archive Viper tape drive connectors and jumper settings" on page 16-20 for the header location.
2	Remove any jumpers on the header in positions A1 and A2. Insert a jumper on the header in position A0. This sets the SCSI ID of the tape drive to 1.
3	Ensure that the Archive Viper tape drive terminator resistor packs are removed as indicated in "Archive Viper tape drive connectors and jumper settings" on page 16-20.
4	Verify the other jumpers as shown in "Mass storage unit (MSU) (NT4R28AC—Archive Viper tape drive)" on page 16-19 and "Archive Viper tape drive connectors and jumper settings" on page 16-20.

Setting the SCSI ID for the Tandberg tape drive

When setting the SCSI ID for the Tandberg tape drive, follow these steps.

Step	Action
1	Find the 2-by-10 header beside the SCSI connector. See "Tandberg tape drive connectors and jumper settings" on page 16-21 and "Tandberg tape drive connectors" on page 16-22 for the header location.
2	Insert jumpers on the header in position 0 and Parity as shown in the first figure. This sets the SCSI ID of the tape drive to 1.
3	Ensure that the tape drive terminator resistor packs are removed.
4	Verify the other jumpers as shown in the illustrations.

Installing a mass storage unit

To install an MSU, follow these steps.

Step	Action
1	Check that the jumper settings are correct. Refer to
	• "Archive Viper tape drive connectors and jumper settings" on page 16-20,
	• "Tandberg tape drive connectors and jumper settings" on page 16-21, or
	• "Tandberg tape drive connectors" on page 16-22, as appropriate.
2	Make sure no SCSI bus terminator is mounted on the tape drive. Refer to
	• "Archive Viper tape drive connectors and jumper settings" on page 16-20,
	• "Tandberg tape drive connectors and jumper settings" on page 16-21, or
	• "Tandberg tape drive connectors" on page 16-22, as appropriate.
3	Slowly insert the MSU.
4	At the rear side, connect the SCSI interface cable with the red stripe in pin #1, and connect the harness cable into the power connector (12 V, 5 V, and ground) of the tape.
	Note 1: There are two power harness cables. One is extra. Secure it for safety.
	Note 2: A longer SCSI cable is included because the connector on the Archive Viper drive needs it to complete the installation.
5	Make sure the MSU is mounted securely. Tighten the mounting and screws.
6	Insert the power converter pack (QPC585).
	Note: DC6150 and DC6250 tapes are recommended for backup. To reduce tape drive wear, use only one type.

Replacing the tape drive

Introduction
See the handling precautions at the beginning of the chapter.

Replacing the tape drive
To replace the tape drive, follow these steps.

Step	Action
1	Power off the prime node.
	Look on the replacement unit for the tape drive jumper settings, as appropriate:
	• "Archive Viper tape drive connectors and jumper settings" on page 16-20
	• "Tandberg tape drive connectors and jumper settings" on page 16-21
	• "Tandberg tape drive connectors" on page 16-22
2	If the node is shadowed, see "Replacing a primary (left side) disk or disk/tape unit in a shadowed system" on page 16-8.
3	Install the new unit in the same MSU slot as the unit you are replacing by carefully sliding the unit in and locking the ejectors in place.
4	Reboot the system.

Mass storage unit (MSU) (NT4R28AC—Archive Viper tape drive)
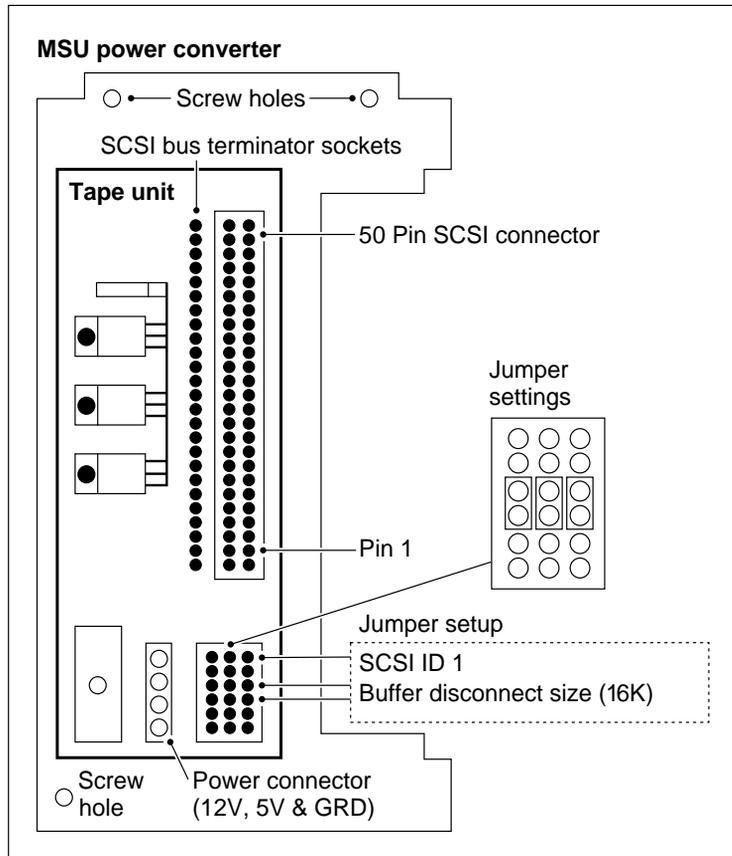
G100006

Archive Viper tape drive connectors and jumper settings
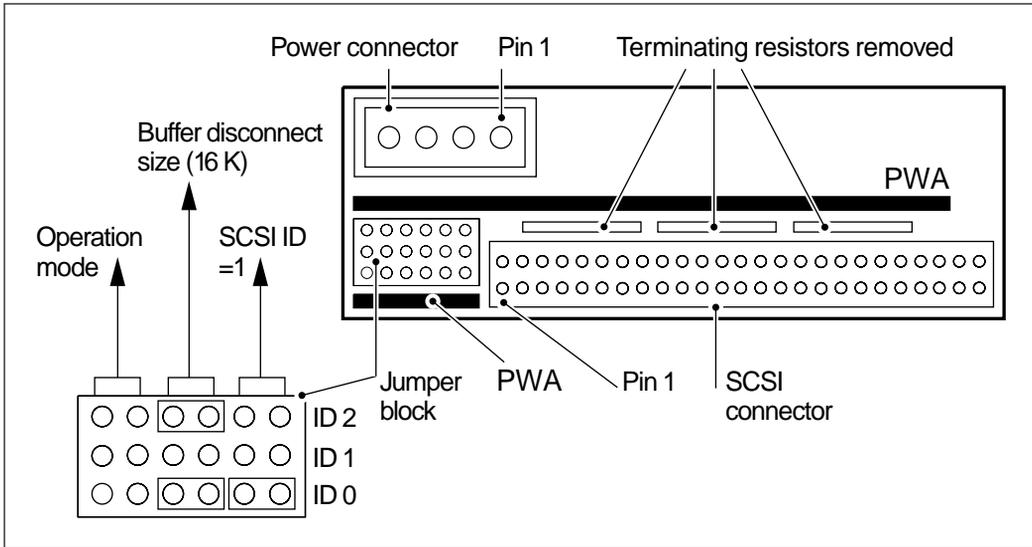
G100025

Tandberg tape drive connectors and jumper settings

Terminating resistors removed

Tpwr

Select 0　　SCSI ID= 1
1
2

Parity

In
Out
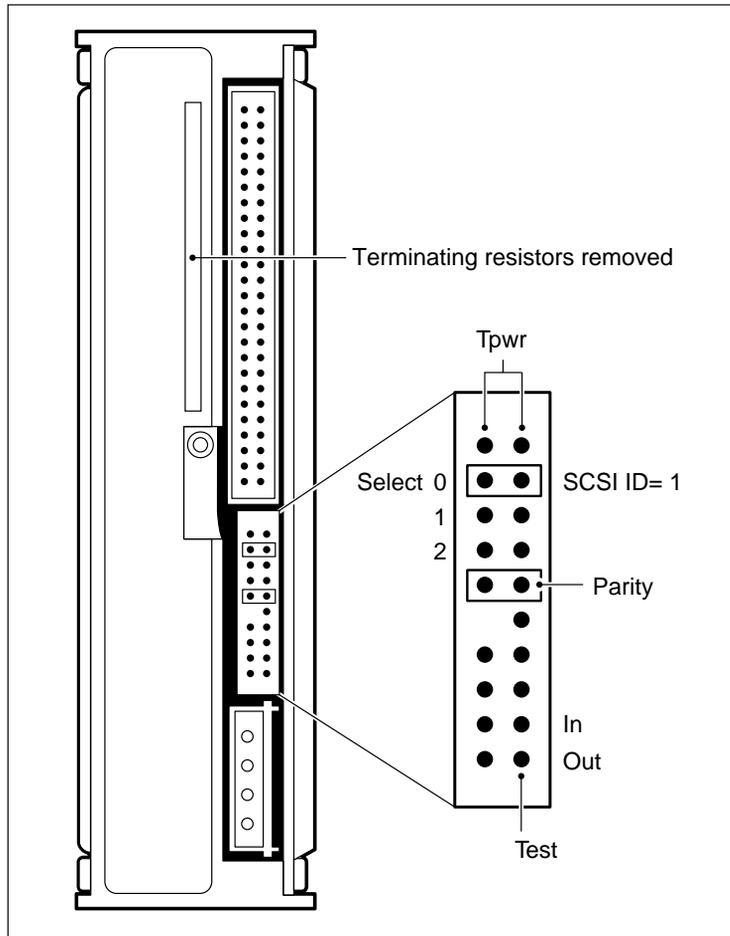
Test

G100016

Tandberg tape drive connectors
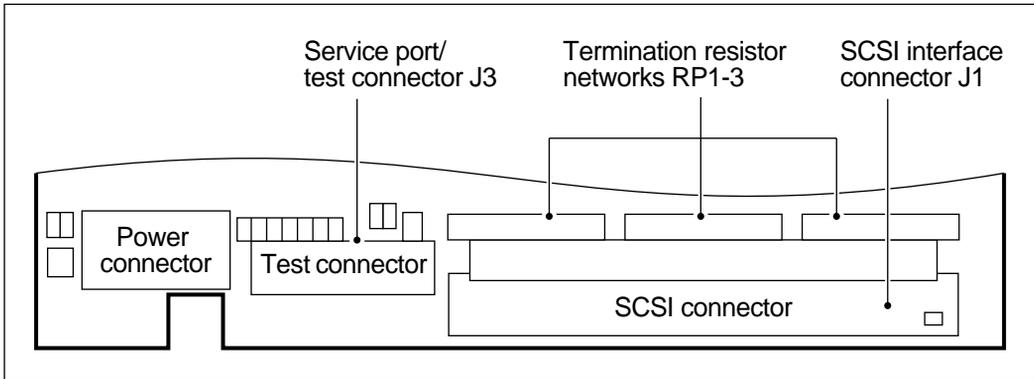
G100022

Chapter 17

Common disk subsystem problems

In this chapter

Diagnostic checklist

Introduction   When checking the disk subsystem problems, follow this diagnostic checklist:

- device jumpers
- bus cabling
- bus termination
- power
- SCSI device sanity test
- relevant SEER messages, especially Maintenance Actions, and SEERs of classes 11 to 14, 31, and 66

Device jumpers   Jumpers are used to set the SCSI ID as well as a number of options on the disk and tape drives. The actual settings on these devices should be checked against the figures and descriptions in Chapter 6 of this manual.

Bus cabling   A SCSI bus runs from the card cage to the disk and tape drives. Check the following:

- Tape unit is securely seated in node 1.
- Disk units are securely seated in each node.
- SCSI pack is securely seated in each node.
- SCSI connector is firmly connected to the backplane.
- SCSI connector is firmly connected to the front of the Enhanced MMP40 (or MMP40) card in each node.

Bus termination   Exactly one set of terminating resistors should be attached to the SCSI devices in a node on the disk drive that is installed in the left MSU slot. The resistor pack is plugged into the AMP socket on the SCSI cable in the MSU cage. All inboard terminating resistors must be removed from all the SCSI devices.

Power   Disk and tape drives are fed by one or more DC power converters and may behave erratically when there are power problems. Follow the procedures in the Meridian Mail power problems section in "Power problems" on page 14-15."

Note: Shadowed nodes require the installation of a load resistor P0710190. For installation details, refer to Chapter 6 of this manual.

SCSI sanity test

Introduction

Use the following procedures to perform a quick sanity check of the SCSI bus by testing tape and disk drives.

Performing a tape drive sanity test

To perform a tape drive sanity test, follow these steps.

Step	Action
1	Power off the module that contains the tape drive.
2	Put a tape in the tape drive.
3	Power on the module.
	The tape drive should make a series of clicking noises as it loads the tape. The message "TAPE RETENSION" appears on the administration terminal, followed by "CI to be loaded."
	The System Installation & Modification menu returns.

Performing a disk drive sanity test

To perform a disk drive sanity test, follow this step.

Step	Action
1	Power on each module.
	As power is applied, the LED on each disk drive should come on briefly and go off. It should not remain continuously lit.

Disk problems identified by SEERs

Introduction
Disk problems are reported by the disk manager in a Class 66 SEER. The complete list of these SEERs can be found in the *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510). The purpose of this section is to give further details of the most common SEERs.

Disk reports a problem
A SEER in the form of

```
 6603/6605 node # disk #> sense key? # error
code: # [block: #]
```

is produced when a disk reports a problem. The sense key describes the general nature of the problem and is standardized. The error code describes the exact problem but is often drive-dependent. An optional disk block number may be associated with the problem report. Look for the following sense keys:

- *Sense key 2* indicates the disk is not ready to accept commands. One possible cause is that the drive is not spinning up. If this appears during regular operation, replace the disk.

- *Sense key 3* normally indicates a medium error. Disk controller problems can also cause this sense key to come out. A block number is provided with this problem report, and the scsi_pkg verify command should be used to check that the block is indeed bad. Replace the disk.

- *Sense key 4* indicates a disk hardware failure.

- *Sense key 5* indicates an invalid command was sent to the drive. If this appears during regular operation, contact Nortel Networks support.

- *Sense key 6* indicates the SCSI bus has been reset. If this appears during regular operation, contact Nortel Networks support.

Problem with talking to disk
A SEER in the form of

```
 6604/6606 node # disk #> driver error #
```

is produced when there is a problem with talking to a disk.

Driver error 129 indicates the disk cannot even be seen and is the most common. It is usually caused by incorrect SCSI ID jumpering on the drive itself or by a bad connection along the SCSI bus.

Performing a disk or disk/tape drive connection integrity test

To perform a disk or disk/tape drive connection integrity test, follow these steps.

Step	Action
1	Verify that the disk or disk/tape drive is firmly seated.
2	Check the jumpers on the drive. See Chapter 6 for details.
3	Ensure that the SCSI cable and power cable from the drive to the drive cage connectors are firmly attached to both ends.

Data loss and disk replacement

Introduction   When a disk fails and needs to be replaced, a tape backup limits
                           data loss:

- A tape backup may have been performed before the failure.
- A tape backup can often be made after the failure.

A system relies on tape backups to reduce data loss during disk
replacement.

If the disk to be replaced is still readable, perform a tape backup
to capture as much of the current data as possible.

⚠	**CAUTION** **Risk of data loss or corruption** When backing up a disk you think may have failed, never back up over an existing good backup. The data on the disk you are backing up may be corrupted and you could destroy useful information.

Method   The backup utility tries to run to completion in spite of disk
                           errors. It is likely that the contents of a number of disk blocks
                           are unrecoverable.

The loss of a small number of blocks usually does not result in
serious operational problems (for example, several corrupted
messages or mailboxes) for Meridian Mail. However, damage to
critical areas can cause a system malfunction.

Replace the disk and restore the backup onto the new disk. If the
system malfunctions afterwards, restore the data from the most
recent backup done prior to the disk failure.

Chapter 18

AML (ISDN/AP) link maintenance

In this chapter

Overview

Introduction

Use the information in this section to maintain the following:

- AML (Application Module Link) for X11 Release 18
- ISDN/AP protocol for X11 releases prior to 18
- Enhanced Serial Data Interface (ESDI) card on Meridian 1
- Multipurpose Serial Data Link (MSDL) card on Meridian 1

Supported cards, protocols, and links

Meridian 1 releases prior to X11 Release 18 support the ESDI card and the ISDN/AP protocol. X11 Release 18 supports both the ESDI and the MSDL card. Release 18 also supports the AML protocol. In this section of the document, AML refers to both AML and ISDN/AP links. Previous releases of Meridian Mail also used the term Command and Status Link (CSL).

The particular AML in question is identified by the device number assigned by prompt ADAN in Overlay 17.

AML (ISDN/AP) link fault detection

Introduction　　The AML (ISDN/AP) consists of several hardware and software components. Failure of any of these components affects the operation of the link. When a faulty link is detected, the Meridian 1 puts the link in the Down state, and all calls are routed to the DN defined in the Night Call Forward (NCFW) field of the Main Meridian Mail ACD Queue. Communication between the Meridian 1 and Meridian Mail is lost until the link is restored.

Error messages　　The following types of error messages are generated on the Meridian 1 maintenance TTY:

- CSA xxx　AML(ISDN/AP) alarm messages
- ESDA xxx and ESDI/MSDL xxx　ESDI/MSDL failure messages
- LNK xxx　errors related to user commands in Overlay 48 where xxx represents the error number and associated information

Check hardware status　　Check the status of the hardware by doing the following:

- Verify any SEER error messages that appear.
- Check the cable connections between the ESDI/MSDL card and the Meridian Mail Enhanced MMP40 (or MMP40) card CSL (AML) connector on the I/O panel.
- Confirm BootROM messages that appear when Meridian Mail is powered on.
- Verify that the option plugs on the ESDI card are in the correct sockets. Verify the switch settings on the MSDL card.
- Bypass intercabinet cabling by connecting a full 25-pin RS-232 cable between the ESDI/MSDL card and the 25-pin RS-232 connector on the Meridian Mail backplane (J3).
- Replace the ESDI/MSDL cable.
- Replace the ESDI/MSDL card.
- Replace the Enhanced MMP40 (or MMP40) card.

- Verify that the Meridian 1 has the correct ROM card(s).
- Verify that the Meridian 1 has the correct software options for the AML (ISDN/AP) application.

Link maintenance

Introduction   Control of the AML (ISDN/AP) is the responsibility of the
                          Meridian 1. There are two main forms of AML (ISDN/AP)
                          maintenance: the Overlay 48 program and a link-resident
                          maintenance program.

Overlay 48   The Overlay 48 program processes maintenance or diagnostic
                          commands, such as Enable and Disable, related to the link.
                          Refer to the *SL-1 Input/Output Guide* (NTP 553-3001-400)
                          for a complete description of Overlay 48 commands.

**Link-resident   The AML (ISDN/AP)-resident maintenance program monitors
maintenance program**   and controls AML (ISDN/AP) operation. The program
                          evaluates the condition of the link and takes the appropriate
                          action (for example, enable, disable). These actions are based
                          on information received from the following software
                          components:

                          • ESDI/MSDL maintenance software

                          • AML (ISDN/AP) polling program

                          • AML (ISDN/AP) maintenance overlay program

                          Once the fault has been isolated, the faulty hardware component
                          is replaced. The link can then be enabled by entering the
                          automatic link setup command (ACMS) in Overlay 48.

**Call and database   Any of the following events can cause an interruption of the
recovery**   AML (ISDN/AP) messaging:

                          • Meridian 1 system reload, initialization, or both

                          • Meridian 1 hardware input/output address conflicts (for
                            example, two SDI, ESDI/MSDL, or D-channel cards with
                            the same addresses)

                          • Meridian 1 or Meridian Mail software upgrades or
                            conversions

                          • ESDI/MSDL, cable, or local data set failures

                          • loose cable connections

                          • manual or overlay controlled disabling of the link

- external equipment as a source of EMI
- loss of commercial power
- other critical failures

When any of these events occur, AML (ISDN/AP) messages indicating a change of call status may be lost. This may result in a conflict between the Meridian 1 and Meridian Mail regarding the status of a terminal or an established call. Once the failure has been recovered, a series of AML (ISDN/AP) messages is used to resolve these conflicts. This activity is controlled by Meridian Mail.

When a system reload occurs, a database discrepancy between Meridian Mail and the Meridian 1 may result in the message waiting indicator not reflecting the actual message waiting status.

AML (ISDN/AP) link commands

Introduction

The Application Module Link (AML) provides a connection to applications such as Meridian Mail. The AML is configured on an Enhanced Serial Data Interface (ESDI) or Multipurpose Serial Data Link (MSDL) card.

In X11 Release 18 and later, the CMS and ESDI commands are replaced by the AML commands shown in the following table:

AML commands

Old commands	New commands
ENL ESDI n	ENL AML n LYR2
DIS ESDI n	DIS AML n LYR2
ENL CMS n	ENL AML n LYR7
DIS CMS n	DIS AML n LYR7
CON ESDI n	EST AML n LYR2
DSC ESDI n	RLS AML n LYR2
(ESDI card) ACMS n	ENL AML n ACMS
(MSDL card) ACMS n	ENL AML n AUTO
SLFT ESDI n	SLFT AML n
STAT CMS n	STAT AML n
STAT ESDI n	STAT AML n
SWCH CMS n n	SWCH AML n n

ACMS n—pre-Release 18

ENL AML n ACMS (ESDI card)—Release 18 and later

ENL AML n AUTO (MSDL card)—Release 18 and later

Set up the AML (ISDN/AP) automatically using the ESDI/ MSDL port number n. The ESDI/MSDL port must first be in the Disabled state (DIS ESDI n or DIS AML n LYR2). This command is equivalent to entering the ENL ESDI n or ENL AML n LYR2, CON ESDI n or EST AML n LYR2, and ENL CMS n or ENL AML n LYR7 command sequence. If the first attempt to enable the link fails, the ACMS program keeps trying until setup is successful or you enter the DIS ESDI or DIS AML

n LYR2 command. Every time the link setup fails, the system prints error messages.

ACMS is a background program and continues until the DIS ESDI or DIS AML n LYR2 command is entered, even if the overlay is aborted.

Note: To disable autorecovery of an MSDL card, use DIS AML n AUTO.

DIS CMS n—pre-Release 18
DIS AML n LYR7—Release 18 and later

Disable AML (ISDN/AP) port number n. This command does not disable the actual ESDI/MSDL port but disables application layer processing. A warning message is given when you attempt to disable the active AML (ISDN/AP), but the command will be accepted.

Note: Do not use this command while the port is performing a self-test (SFLT) on the AML link.

ENL CMS n—pre-Release 18
ENL AML n LYR7—Release 18 and later

Enable AML (ISDN/AP) port number n. This command is successful only when the associated hardware components (ESDI/MSDL port) are enabled. The ESDI/MSDL port must be in the CONNECTED state (see CON ESDI or EST AML n and ACMS [Release 17], or ENL AML n ACMS or ENL AML n AUTO commands [Release 18]).

The Enable command triggers the sending of an AML (ISDN/AP) polling message to Meridian Mail. If the Meridian 1 receives the correct response, a positive response is printed on the TTY, and a polling message is sent every five seconds. If there is no response to the polling message, an error message is printed, and no more polling messages are sent.

AML (ISDN/AP) link and ESDI/MSDL diagnostics

Introduction   Use the following commands to determine link status:

STAT CMS—pre-Release 18

STAT AML—Release 18 and later

Display the status of all AML (ISDN/AP) links.

STAT CMS n—pre-Release 18

STAT AML n—Release 18 and later

Display the status of the AML (ISDN/AP) link using ESDI/
MSDL port n.

CON ESDI n—pre-Release 18

EST AML n LYR2—Release 18 and later

Set up the Link Layer (LAPB protocol) for the AML (ISDN/
AP) application on ESDI/MSDL port n, which is placed in the
CONNECTED state. This command is valid only if the ESDI/
MSDL port is ENABLED. To enable the AML (ISDN/AP) link,
the ENL CMS or ENL AML n LYR7 command must also be
entered.

DIS ESDI n—pre-Release 18

DIS AML n LYR2—Release 18 and later

Disable ESDI/MSDL port N. The link layer is disconnected and
the ESDI/MSDL will not respond to far-end requests for link
initialization. A warning message appears if an attempt is made
to disable the active AML (ISDN/AP) link, but the link can be
disabled if desired.

DSC ESDI n—pre-Release 18

RLS AML n LYR2—Release 18 and later

Disconnect the link layer and place the port in the ENABLED
state. This command applies only when the port is in the
CONNECTED state.

ENL ESDI n—pre-Release 18

ENL AML n LYR2—Release 18 and later

Enable ESDI/MSDL port number n. This command initiates a self-test of the ESDI/MSDL port hardware. If the command is successful, the port is placed in the ENABLED state. The CON ESDI or EST AML n LYR2 and ENL CMS or ENL AML x LYR7 commands must be issued before the AML (ISDN/AP) link is fully operational. See also the ACMS command.

SLFT ESDI n—pre-Release 18

SLFT AML n—Release 18 and later

Perform the self-test on ESDI/MSDL port n. This command is valid only if the specified port is ENABLED and the other port on the ESDI/MSDL card is configured and DISABLED. (Before doing the self-test, configure the ESDI port not being tested with the following values: IADR = 1 and RADR = 3 [ESDI only].)

STAT ESDI—pre-Release 18

STAT AML n—Release 18 and later

Display the status of all ESDI/MSDL ports.

ESDI/AML states   An ESDI/AML port may be in one of the states shown in the following table.

ESDI/AML port states

DISABLED	The ESDI/AML port has been disabled by the DIS ESDI/AML command.
ENABLED	The ESDI/AML port has been enabled, but the link layer has not been set up by the CON ESDI/AML command. The ESDI/AML port must be in the ENABLED state to perform the self-test.
CONNECTED	The ESDI/AML link layer (LAPB protocol) is set up (see CON ESDI/AML command), and the port is ready to send and receive messages.

AUTO SET UP	The ESDI/AML is attempting to set up the LAPB layer for AML (ISDN/AP) applications. This state occurs during automatic recovery of the AML (ISDN/AP) link or while the ACMS command is in progress.

MSDL/AML states

Layer 2 and layer 7 states of an MSDL/AML port are reported separately by the STAT AML command.

Layer 2 may be disabled, released, or established. Layer 7 may be disabled or active. Refer to the *SL-1 Input/Output Guide* (NTP 553-3001-400) for a more complete description.

The messages listed in "ESDA error messages" on page 18-12 and "CSA error messages" on page 18-13 include additional information where

n = AML (ISDN/AP) link number (see prompt ADAN in Overlay 17)

t = the system time

x = the reason that the error code was issued

Only a partial list of errors (those applicable to Meridian Mail) is included here. For a complete list of possible error codes (including ESDI/MSDL and LNK codes), see the *SL-1 Input/ Output Guide*.

ESDA error messages

ESDA 001 n t x	ISDN Applications Protocol Link n is down. The reason is indicated by x.
x = 6	ESDI/MSDL HDLC hardware failure
	Action: Check for AML(ISDN/AP) (CSL) SEERs.
	Important SEERs are: 25–50—Layer 2 status code 25–60—Layer 2 function return code
x = 7	ESDI/MSDL HDLC detected link 3 failure, or far-end disconnect. This may be a transient problem. The ISDN Applications Protocol Link should recover.
	Action: If the link does not recover, check for Meridian Mail problems.
	Important SEERs are: 25–50—Layer 2 status code 25–60—Layer 2 function return code
x = 8	HDLC Link Layer Restarted
	Action: This may occur once or twice during AML (ISDN/AP) link start-up. If the link does not come up, check for Meridian Mail problems.
	Important SEERs are: 25–50—Layer 2 status code 25–60—Layer 2 function return code
ESDA 002 n t	ISDN Applications Protocol Link n link layer is connected.

CSA error messages

CSA 001 n t x	SDN Applications Protocol Link n cannot be brought up automatically.
x = 1	The ESDI/MSDL is in an invalid state.
	Actions:
	1. Reseat the ESDI/MSDL card.
	2. Disable and enable the ESDI/MSDL card. (DIS ESDI/MSDL and ENL ESDI/MSDL commands on pre-release 18 and DIS AML n LYR2 and ENL AML n LYR2 on release 18 and later)
	3. Replace the ESDI/MSDL.
x = 4	ESDI/MSDL Failed the test
x = 8	ESDI/MSDL HDLC link layer setup failed.
	Actions:
	1. Check cables.
	2. See ENLC and ENLU commands.
	3. Check for relevant SEERs on Meridian Mail.
x = 9	ESDI/MSDL is not responding.
	Actions:
	1. Check the QPC513 ESDI/MSDL switch settings.
	2. Check the ESDI/MSDL cables and Meridian Mail status cable.
	3. Ensure that all ESDI/MSDLs have different addresses.
	4. Use Overlay 48 to check the ESDI/MSDL status. See STAT ESDI/MSDL command on pre-release 18 systems and STAT AML n on release 18 and later systems.
	5. Disable and enable the ESDI/MSDL card. (DIS ESDI/MSDL and ENL ESDI/MSDL commands on pre-release 18 and DIS AML n LYR2 and ENL AML n LYR2 on release 18 and later)
	6. Replace the ESDI/MSDL.

x = 10	No response from Meridian Mail to the ISDN APL polling messages.
	Actions:
	1. Check the SL-1 software release (should be X11 R12.31+ or greater).
	2. Check the ESDI/MSDL switch settings.
	3. Ensure that all SDIs have different addresses. Replace any QPC45 SDI card with a QPC513 SDI.
	4. Check for relevant SEERs on Meridian Mail.
CSA 002 n t x	ISDN Applications Protocol Link n is out of service.
x = 1	The ESDI/MSDL is out of service.
	Action: Check for ESDA 001 message.
CSA 003 n t	ISDN Applications Protocol Link n is up and active.
CSA 004 n t	ISDN Applications Protocol Link n is up and standing by.

Appendix A

Terminal configuration

In this chapter

Overview

Introduction   Several models of administration terminal can be used with
                          Meridian Mail. Chapter 11 shows how to cable these terminals
                          to the printer and the A/B switchbox.

                          This appendix describes how to configure the following
                          terminals for proper data communications with Meridian Mail:

                          •   HP700/22 terminal (see page A-4)

                          •   HP700/32 terminal (see page A-7)

                          •   NT220 terminal (see page A-11)

                          •   VT220 terminal (see page A-14)

                          •   VT320 terminal (see page A-16)

                          •   VT420 terminal (see page A-18)

                          •   VT520 terminal (see page A-20)

                          Note: The VT420 terminal has been discontinued by the
                          manufacturer and is superseded by the VT520.

                          Configure a terminal by entering setup mode.

                          ┌───┐
                          │   **CAUTION**   │
                          │   **Risk of data loss or corruption**   │
                          │   │
                          │   You can enter setup mode at any time,   │
                          │   but do so only while logged off Meridian   │
                          │   Mail.   │
                          └───┘

Field types in terminal setup screens

Introduction   There are three types of fields in terminal setup screens: action, read-only and parameter entry, or selection. Most of the fields on the screens, and almost all the fields you need to use for setup, are parameter entry or selection fields.

Action fields are underscored in the setup screens. Action fields cause an action, such as clearing the display, to take place. Unless instructed otherwise, you do not need to use action fields.

Note: The underscores do not appear on the terminal screen.

Parameter entry or selection fields are used to enter or select terminal parameter values.

Configuring an HP700/22 terminal

Configuring an HP700/22 terminal

To configure an HP700/22 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row.
	The General setup screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3	Change the values in each parameter field on each setup screen as necessary to match those shown in "HP700/22 setup screens" on page A-5.

Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values that are displayed in the field or cause requested action to take place (depends on type of field).
<NextScreen>	Move to the next setup screen.
<PrevScreen>	Move to the previous setup screen.

Step	Action
4	Save your changes by returning to the General Setup screen, moving the cursor to the Save field, and pressing <Enter>.
5	Exit setup mode by pressing the <SETUP> key.

HP700/22 setup screens

```
                              General Setup
                Clear Display    Clear Communications     Reset Terminal
                        Recall     Save      Default      Setup = English

   Terminal Mode       EM200, 7 Bit Ctrls    EM100 ID                  EM200
   On Line             YES                    Interpret Control Mode    YES
   Columns             80                     User Features Locked      NO
   Smooth Scroll       YES                    User Defined Keys Locked  NO
   Block Cursor        YES                    Numeric Mode Keypad       NO
   Cursor OFF          NO                     Normal Mode Cursor Keys   YES
   Light Background    NO                     National Character Set    NO
   Inhibit Auto Wrap   NO                     Frame Rate                72
   New Line            NO                     Display OFF After (min)   15
   MultiPage           NO
   Status Line         Indicator
```

```
                          Communications Setup

   Host
   Xmit Baudrate       9600                   XON/XOFF                  @ 64
   Recv Baudrate       =Xmit                  Disconnect Delay          2 s
   DataBits/Parity     8/None                 Stop Bits                 1
   Check Parity        NO                     Local Echo                NO
   Port Selection      EIA, Data Leads Only   Unlimited Xmit            NO

   Printer
   Baudrate            9600                   Print Mode                Normal
   DataBits/Parity     8/None                 Print Scroll Region       NO
   Stop Bits           1                      Terminator                None
   Character Set       National Only
```

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HP700/22 setup screens (continued)

```
                              Keyboard Setup

Keyboard Language   North American     Data Processing Keys        NO
Keyclick            YES                Shift Lock                  NO
Margin Bell         YES                Break                       YES
Warning Bell        YES                Auto Repeat                 YES

Answerback =                           Auto Answerback             NO

              ┌──────────────────────────┐
              │                          │
              └──────────────────────────┘

Conceal Answerback            Clear All Tabs            Set 8 Column Tabs
┌──────────────────────────────────────────────────────────────────────┐
│    T       T       T       T       T       T       T       T       T   │
└──────────────────────────────────────────────────────────────────────┘
123456789012345678901234567890123456789012345678901234567890123456789 0123
┌───────────────────────────────────────────────────────┐
│    T       T       T       T       T       T           │
└───────────────────────────────────────────────────────┘
1234567890123456789012345678901234567890123456 78
```

```
                    Programmable Function Key Setup

Function Key         F6                        Clear Key

Qualifier Key        Shift                     Clear All Keys

Key Definition


┌───────────────────────────────────────────────────────────────────────┐
│                                                                         │
└───────────────────────────────────────────────────────────────────────┘
```

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Configuring an HP700/32 terminal

Configuring an HP700/32 terminal

To configure an HP700/32 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row.
	The Global setup screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3	Change the values in each parameter field on each setup screen as necessary to match those shown in "HP700/32 setup screens" on page A-8.

Key	Description
Up and down arrow	Move from field to field.
Left and right arrow	Scroll through possible values for a parameter. The values are displayed in a window at the bottom of the screen.
<Enter>	Cause the requested action to take place in an action field.
<NextScreen>	Move to the next setup screen.
<PrevScreen>	Move to the previous setup screen.

Step	Action
4	Save your changes by pressing <F6-SaveMenu> on *each screen* you change.
5	Exit setup mode by pressing the <SETUP> key.

HP700/32 setup screens

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Host Port   1
Background   Dark
Screen Saver   10 Min
Refresh Rate   72 Hz
Key Click   Yes
Keyboard   U.S.
Message Translations English
Setup Translations   English
Clear Display
Clear Comm
ROM Revision   C1017-80004-2948

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Smooth Scroll   Jump   Display Width   80
Curser Type   Box   Display Width Allowed 80 or 132
Curser   On   Char Cell Height   16 Dots
2nd Message Line   On   Clr on Width Change   Yes
Message Line   On   Aux Mode   Off
Status Line   On   Aux To Host   No
On Line   Yes   Print Terminator = FF No
Local Echo   Off   Logical Page Size   24
Auto Wrap   Off   Number of Pages   1
Auto Linefeed   Off
Display Ctrl Codes Off

G101087

HP700/32 setup screens (continued)

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Emulation	VT320
Terminal Id	VT220
Control Codes	7-Bit
Characters Mode	8-Bit
Preferred Char Set	DEC Supplemental
Keypad Mode	Application
Curser Keys	Normal
Print Scroll Region	Off
User Features Locked	No
User Keys Locked	No
Data Processing Keys	No

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Communication	Full Duplex	CD	Ignore
Data Length	8-Bits	Break Duration	170ms
Parity	None	Disconnect Delay	Never
Stop Bits	1	Aux Printer Type	National
Xmit Baud	9600		
Recv Baud	=Xmit		
Xmit Pace	Xon/Xoff		
Recv Pace	Xoff at 128		
Limited Transmit	Off		
DSRI	No		
CTS	Ignore		

G101088

HP700/32 setup screens (continued)

| GLOBAL | USER | EMULATION | PORT 1 | PORT 2 | KEYBRD | PROGRAM |

Communication	Full Duplex
Data Length	8-Bits
Parity	None
Stop Bits	1
Xmit Baud	9600
Recv Baud	=Xmit
Xmit Pace	DSR/Xon/Xoff
Recv Pace	Xoff at 128
Limited Transmit	Off
Break Duration	170ms
Aux Printer Type	National

| GLOBAL | USER | EMULATION | PORT 1 | PORT 2 | KEYBRD | PROGRAM |

Lock Key	Caps Lock	Tab setting
Kbd Lock Enable	Yes	
Save Tabs	Yes	
Auto Repeat	Yes	
Margin Bell	Yes	
Warning Bell	Yes	
Auto AnswerBack	Yes	
Answerback =		
Conceal Answerback	No	
Clear all Tabs		
Set 8 Column Tabs		

G101089

Configuring an NT220 terminal

Configuring an NT220 terminal

To configure an NT220 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row. The General Set-Up screen is displayed with the current setup values. ***Note:*** There may be minor differences between what you see in this chapter and the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3	Change the values in each parameter field on each setup screen as necessary to match those shown in "NT220 setup screens" on page A-12. Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values or cause requested action to take place (depends on type of field).

Step	Action
	To move to the next setup screen, select To Next Set-Up Screen on any setup screen.
4	Save your changes by returning to the General Set-Up screen, moving the cursor to the Save Current Values field, and pressing <Enter>.
5	Exit setup mode by pressing the <SETUP> key.

NT220 setup screens

```
General Set-Up

To Next Set-Up Screen          NT220 Mode, Bit Controls

On Line

Clear Display                  User Defined Keys Unlocked

Clear Communications           User Features Unlocked

Reset Terminal                 Application Keypad

Recall Saved Values            Normal Cursor Keys

Save Current Values            No New Line

Default Values                 Set-Up = English

Refresh Rate = 60 Hz           North American Keyboard
```

```
Printer Comm. Set-Up           Host Comm. Set-Up

To Next Set-Up Screen          Transmit = 9600

Speed = 9600                   Receive = Transmit

Normal Print Mode              XOFF at 64

8 Bits, No Parity              8 Bits, No Parity

1 Stop Bit                     1 Stop Bit

Print Full Page                No Local Echo

Print National Only            EIA Port, Data Leads Only

No Terminator                  Disconnect, 2 s Delay

Bidirectional Off              Limited Transmit
```

G101093

NT220 setup screens (continued)

Display Set-Up	Keyboard Set-Up
To Next Set-Up Screen	**Typewriter Keys**
80 Columns	**Caps Lock**
Interpret Controls	**Auto Repeat**
Auto Wrap	**Keyclick**
Jump Scroll	**Margin Bell**
Light Text, Dark Screen	**Warning Bell**
Cursor	**Break**
Block Cursor Style	**Multinational**
Flip Off	**DEL = DEL; Shift/DEL = BS**

Answerback/Tab Set-Up	Enhance/Block Mode Set-Up
To Next Set-Up Screen	**CRT Saver Enabled**
No Auto Answerback	**Clear Screen after Size Change**
Not Concealed	**Define Function Key**
Answerback =	**COMPOSE Key Enabled**
	Transmit Line
Clear All Tabs	**End Of Line Char = CR/CRLF**
Set 8 Column Tabs	**No End Of Block Char**

G101094

Configuring a VT220 terminal

Configuring a VT220 terminal

To configure a VT220 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row.
	The Setup Directory screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3	Change the values in each parameter field on each setup screen as necessary to match those shown in "VT220 setup screens" on page A-15.

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values or cause requested action to take place (depends on type of field).

To move to another setup screen, select a screen from the top line of the Setup Directory screen and press <Enter>. To move to the next setup screen, select To Next Set-Up on any other setup screen.

Step	Action
4	Save your changes by returning to the Setup Directory screen, moving the cursor to the Save field, and pressing <Enter>.
5	Exit setup mode by pressing the <SETUP> key.

VT220 setup screens

```
Set-Up Directory
Display    General   Comm     Printer    Keyboard    Tab
On Line   Clear Display   Clear Comm   Reset Terminal   Recall    Save
Set-up=English    North American Keyboard    Default    Exit
```

```
Display Set-Up
To Next Set-Up    To Directory   80 Columns    Interpret Controls
Auto Wrap    Jump Scroll    Light Text, Dark Screen
Cursor    Block Cursor Style
```

```
General Set-Up
To Next Set-Up    To Directory  VT200 Mode, 7 Bit Controls
User Defined Keys Unlocked    User Features Unlocked    Multinational
Application Keypad    Normal Cursor Keys    No New Line
```

```
Communications Set-Up
To Next Set-Up    To Directory    Transmit=9600    Receive=Transmit
Xoff at 128    8 Bits, No Parity    1 Stop Bit    No Local Echo
EIA Port, Data Leads Only    Disconnect, 2 s Delay    Limited Transmit
```

```
Printer Set-Up
To Next Screen    To Directory   Speed=9600
Normal Print Mode    7 Bits, Odd Parity    1 Stop Bit
Print Full Page    Print National Only    No Terminator
```

```
Keyboard Set-Up
To Next Set-Up    To Directory   Typewriter Keys    Caps Lock
Auto Repeat    Keyclick    Margin Bell    Warning Bell    Break
No Auto Answerback    Answerback =             Not Concealed
```

G101098

Configuring a VT320 terminal

Configuring a VT320 terminal

To configure a VT320 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row.
	The Setup Directory screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3	Change the values in each parameter field on each setup screen as necessary to match those shown in "VT320 setup screens" on page A-17.

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values or cause requested action to take place (depends on type of field).

	To move to another setup screen, select a screen from the top line of the Setup Directory screen and press <Enter>. To move to the next setup screen, select To Next Set-Up on any other setup screen.
4	Save your changes by returning to the Setup Directory screen, moving the cursor to the Save field, and pressing <Enter>.
5	Exit setup mode by pressing the <SETUP> key.

VT320 setup screens

```
Set-Up Directory
Display    General    Comm    Printer    Keyboard    Tab
On Line    Clear Display    Clear Comm    Reset Terminal    Recall    Save
Set-up=English    North American Keyboard    Default    Exit
```

```
Display Set-Up
To Next Set-Up    To Directory    80 Columns    Interpret Controls
Auto Wrap    Jump Scroll    Light Text, Dark Screen
Cursor    Block Cursor Style    Indicator Status Display
```

```
General Set-Up
To Next Set-Up    To Directory VT300 Mode, 7 Bit Controls    VT220 ID
User Defined Keys Unlocked    User Features Unlocked    8-bit Characters
Application Keypad    Normal Cursor Keys    No New Line
UPSS DEC Supplemental
```

```
Communications Set-Up
To Next Set-Up    To Directory    Transmit=9600    Receive=Transmit
Xoff @ 128    8 Bits, No Parity    1 Stop Bit    No Local Echo
DEC 423, Data Leads Only    Disconnect, 2 s Delay    Limited Transmit
No Auto Answerback    Answerback =                 Not Concealed
```

```
Printer Set-Up
To Next Set-Up    To Directory    Speed=9600    Printer to Host
Normal Print Mode    NO XOFF    8 Bits, No Parity    1 Stop Bit
Print Full Page    Print National Only    No Terminator
```

```
Keyboard Set-Up
To Next Set-Up    To Directory    Typewriter Keys    Caps Lock
Auto Repeat    Keyclick    Margin Bell    Warning Bell    Break
Compose    <X]    Delete
, , and . .  Keys            < >  Key            `~  Key
```

G101097

Configuring a VT420 terminal

Configuring a VT420 terminal

To configure a VT420 terminal, follow these steps.

Note: The VT420 terminal has been discontinued by the manufacturer and is superseded by the VT520.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row.
	The Setup Directory screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3	Change the values in each parameter field on each setup screen as necessary to match those shown in "VT420 setup screens" on page A-19.

Key	Description
Arrow keys	Move from field to field.

To move to another setup screen, select a screen from the top line of the Setup Directory screen and press <Enter>. To move to the next setup screen, select To Next Set-Up on any other setup screen.

Step	Action
4	Save your changes by returning to the Setup Directory screen, moving the cursor to the Save field, and pressing <Enter>.
5	Exit setup mode by pressing the <SETUP> key.
	Note: If your system has been upgraded to Meridian Mail Release 13, and the VT420 screen does not clear, change the Sessions on COMM1 value in the Global Setup screen to S1=COMM1 to avoid having to redraw the screen.

VT420 setup screens

```
Set-Up Directory
Global    Display    General    Comm    Printer    Keyboard    Tab
Clear Display    Clear Comm    Reset Session    Recall    Save
Set-up = English    Canadian (English) Keyboard    Default
Enable Sessions    Disable Sessions    Exit    Screen Align
```

```
Global Set-Up
To Next Set-Up    To Directory
On Line    Sessions on Comm1    CRT Saver
Comm1=RS-232    70Hz    Printer shared
```

```
Display Set-Up
To Next Set-Up    To Directory    80 Columns    Interpret Controls
Auto Wrap    Jump Scroll    Dark Screen
Cursor    Block Style Cursor    Indicator Status Display
Cursor Steady    6x24 pages    24 Lines/Screen
Vertical Coupling    Page Coupling    Auto Resize Screen
```

```
General Set-Up
To Next Set-Up    To Directory    VT400 Mode,    7 Bit Controls
User Defined Keys Unlocked    User Features Unlocked    8-bit Characters
Application Keypad    Normal Cursor Keys    No New Line
UPSS DEC Supplemental    VT220 ID
When Available Update
```

```
Communications Set-Up
To Next Set-Up    To Directory    Transmit=9600    Receive=Transmit
Xoff @ 64    8 Bits, No Parity    1 Stop Bit    No Local Echo
Data Leads Only    Disconnect, 2 s Delay    Limited Transmit
No Auto Answerback    Answerback =    Not Concealed
Modem High Speed = ignore    Modem Low Speed = ignore
```

```
Printer Set-Up
To Next Set-Up    To Directory    Speed=9600    Printer to Host
Normal Print Mode    NO XOFF    8 Bits, No Parity    1 Stop Bit
Print Full Page    Print National Only    No Terminator
```

```
Keyboard Set-Up
To Next Set-Up    To Directory    Typewriter Keys    Caps Lock
Auto Repeat    Keyclick High    Margin Bell Off    Warning Bell High
Character Mode    <X]    Delete    Local Compose    Ignore Alt
F1 = Hold    F2 = Print    F3 = Set-Up    F4 = Session    F5 = Break
, < and . >  Keys         < >  Key         `~  Key
```

G101090

Configuring a VT520 terminal

**Configuring a
VT520 terminal**

To configure a VT520 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the <SETUP> key located on the top row of function keys. If no key is marked <SETUP>, press the third key from the left on the top row. The Main Set-Up window is displayed (see the following illustration).

VT520 terminal Main Set-Up window

```
        Actions              ▷
        Session              ▷
        Display              ▷
        Terminal type        ▷
        ASCII emulation      ▷
        Keyboard             ▷
        Communication        ▷
        Modem                ▷
        Printer              ▷
        Tabs...
        Set-Up language      ▷

   ▢    On-line
        Save settings
        Restore settings
        Exit Set-Up
```

G101091

Step	Action
3	Use the up and down arrow keys to highlight the setup feature that is to change.
4	When the setup feature is highlighted, use one of the following methods to select the appropriate settings.
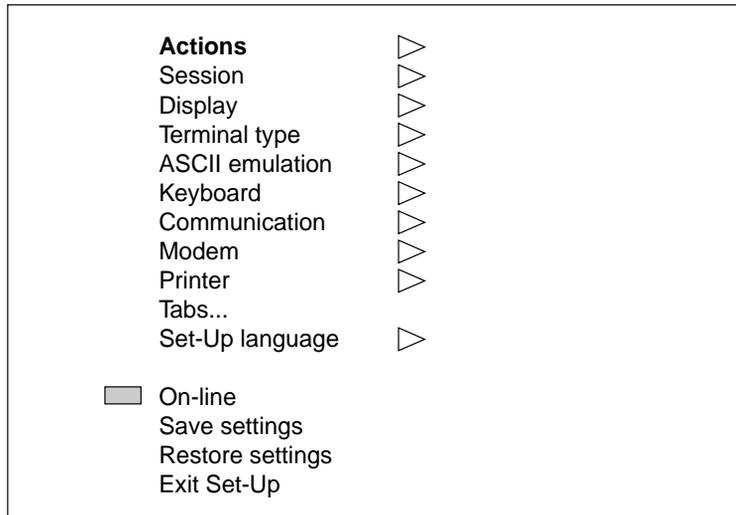
IF	THEN
a solid triangle appears beside the setup feature	use the right arrow key to automatically display the pop-up window of associated settings. See the following illustration for an example.
a box appears beside the setup feature	press <Enter> to toggle the setting for the selected feature on or off. A diagonal line appears in the box when the setting is on.
three dots (. . .) appear beside the setup feature	press <Enter> to display the associated pop-up window. When all fields have been completed, move the cursor to [OK] or [Cancel], and press <Enter> again to activate your choice.

VT520 terminal—sample feature pop-up window

Actions ▷	Clear Display
Session ▷	Clear Communications
Display ▷	Reset this session
Terminal type ▷	Restore factory defaults
ASCII emulation ▷	
Keyboard ▷	Clock
Communication ▷	Calculator
Modem ▷	Show character sets
Printer ▷	Banner message...
Tabs...	
Set-Up language ▷	
☐ On-line	
Save settings	
Restore settings	
Exit Set-Up	

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Note: Features shown in parentheses appear dimmed on the window.

5   Configure the terminal to match the mandatory settings in "VT520 setup values" on page A-22. If no setting is specified, select the parameter that best suits your environment.

6   Press <SETUP> again to exit setup mode.

VT520 setup values

Setup feature	First level	Mandatory setting or description
Actions	Clear Display	Press <Enter> to clear the display.
	Clear Communications	Press <Enter> to clear communications.
	Reset this session	Press <Enter> to reset this session.
	Restore factory defaults	Press <Enter> to restore the factory default.
	Clock	Press <Enter> to set the VT520 clock.
	Calculator	Press <Enter> to use the VT520 calculator.
	Show character sets	Press <Enter> to display character sets.
	Banner message . . .	Press <Enter> to set the banner message.
Session	Select Session	Select Session 1.
	Session name . . .	Optional user text
	Pages per session . . .	04 pages maximum
	Soft char sets/session	Two each S1 and S2
	Save settings for all	
	Restore settings for all	
	Copy settings from	
	Update session	At regular intervals
Display	Lines per screen	24, 25, or 26
	Lines per page	24 lines X 01 pages
	Review previous lines	ON
	Columns per page	80 columns, Clear on change
	Status display	Local status
	Scrolling mode	Jump
	Screen background	Dark
	Cursor display	Enable cursor, Block, Blink
	Cursor coupling	Set to "Vertical" and "Page."
	Cursor direction	Left to right
	Copy direction	Left to right
	Zero	Select style of zero you want to display.
	Auto Wrap	ON
	New line mode	
	Lock user preferences	
	Show control characters	
	CRT saver	
	Energy saver	
	(Overscan)	
	Framed windows	ON (Set to OFF to enable Overscan.)

Setup feature	First level	Mandatory setting or description
	Screen alignment	
Terminal type	Emulation mode	VT520
	Terminal ID to host	VT520
	VT default char set	DEC Multinational—see user documentation as well.
	PC Term character set	DEC Multinational—see user documentation as well.
	(7-bit NCRS characters)	
	Transmit 7-bit cable	ON
(ASCII emulation)		
Keyboard	VT Keyboard language	Select appropriate language—Canadian English
	(PC Keyboard language)	
	Define key . . .	Use Define Key Editor screen to set the following: F1=Hold Ignore Alt F2=Print ,< and .> Keys F3=Setup <> Key F4=Session `~ Key F5=Break
	Save key definitions	
	Recall key definitions	
	Lock key definitions	
	Caps lock function	Caps lock
	Keyclick volume	High
	Warning bell volume	High
	Margin bell volume	OFF
	Keyboard encoding	Character (ASCII)
	Auto Repeat	
	Data processing keys	
	Application cursor keys	
	Application keypad mode	
	(Map PC keyboard to VT)	
	Ignore missing keyboard	
Communication	Port select . . .	See "Port selection for VT520" on page A-25.
	Word size	8 bit
	Parity	None

Setup feature	First level	Mandatory setting or description
	Stop bits	1 bit
	Transmit speed	2400 baud (9600 with MMP40)
	Receive speed	Transmit speed
	Transmit flow control	XON/XOFF
	Receive flow control	XON/XOFF
	Flow control threshold	Low
	Transmit rate limit	150 cps
	Fkey rate limit	150 cps
	Ignore Null character	ON
	Local echo	
	Half duplex	
	Auto answerback	ON
	Answerback message . . .	Enter the answerback message.
	Answerback concealed	
Modem	Enable modem control	
	(Disconnect delay)	
	(Modem high speed)	
	(Modem low speed)	
Printer	Port select . . .	See "Port selection for VT520" on page A-25.
	Print mode	Normal
	Printer type	DEC ANSI
	DEC/ISO char sets	Country dependent setting
	(PC character sets)	
	Print extent	Full page
	Print terminator	None
	Serial print speed	9600 baud
	2-way communication	XON/XOFF
	Transmit flow control	ON
	Receive flow control	XON/XOFF
	Word size	8 bits
	Parity	None
	Stop bits	1 bit
Tabs	Tabs Set-Up Screen	
Set-Up language		User-dependent
On-line		ON
Save settings		When settings are complete, press <Enter> to save.

Setup feature	First level	Mandatory setting or description
Restore settings		
Exit Set-Up		

Port selection for VT520

G101110

Appendix B

Modem configuration

In this chapter

Overview

Introduction   Each modem supplied with Meridian Mail needs to be
                          configured before it is used. Modems must be configured so the
                          baud rate matches that of the terminal and the CPU's NVRAM
                          (non-volatile memory).

                          The modems are configured in such a way that the connection
                          from the modems to Meridian Mail operates at a speed that is
                          independent of the telephone line connection.

                          For instance, an older 2400 bps modem (such as the Ven-Tel
                          2400-33) can be set to communicate with Meridian Mail at
                          9600 bps, while the telephone connection operates at the
                          maximum modem speed of 2400 bps.

                          All modems, with the exception of UDS, need to be connected
                          to a terminal for configuration. If you wish, you can connect a
                          modem temporarily to the Meridian Mail administration
                          terminal for configuration, and move it to its permanent location
                          afterwards.

Modem configuration   Modem configuration involves the following:

                          1. Temporarily connect the local administration terminal to
                              the local modem.

                              – For modem 2400 bps access, set the terminal to
                                 2400 bps.
                              – For modem 9600 bps access, set the terminal to
                                 9600 bps.

                          2. Send the appropriate commands to the modem.

Note: The UDS modem may be configured from the front panel if you prefer.

ATTENTION

Use a remote modem or terminal at the same speed as the Meridian Mail local administration terminal you are accessing to prevent flow control problems.

Note: Modem configuration can vary slightly from one model to the next. Refer to the manual that accompanies your modem as well as the procedures in this chapter.

Supported modems

Introduction   The following table lists the modem models that are supported
in Meridian Mail Release 13, and indicates whether the modem
can be used for local or remote access, and the bps operation in
which it can be used.

Supported modems

	Local modem (console speed)		Remote-access modem (line speed)	
	2400 bps	**9600 bps**	**2400 bps**	**9600 bps**
U.S. Robotics Sportster 14.4	✔	✔	✔	✔
Racal ALM 3223	✔	✔	✔	✔
Hayes Optima 144	✔	✔	✔	✔
UDS 2440	✔	✔	✔	✔
UDS EC 224 A/D	✔	✔	✔	✔
Ven-Tel 2400-33/2400 Plus II	✔	✔	✔	✔
Ven-Tel 9600 Plus/9600 Plus II	✔	✔	✔	✔

This chapter is divided into the following sections:

- ***Connecting the modem to the administration terminal***
  This section provides instructions for connecting the
  modem to the administration terminal so it can be
  configured for use. This section applies to all modems
  regardless of their make or model.
- ***U.S. Robotics modem***   This section describes how to
  configure the U.S. Robotics modem as either a local or
  remote-access modem.
- ***Racal modem***   This section describes how to configure the
  Racal modem as either a local or remote-access modem.
- ***Hayes modem***   This section describes how to configure the
  Hayes modem as either a local or remote-access modem.
- ***UDS modems***   This section describes how to configure the
  UDS modem as either a local or remote-access modem.
- ***Ven-Tel modems***   This section describes how to configure
  the Ven-Tel modem as either a local or remote-access
  modem.

Refer to the appropriate section for the modem you are using.

Connecting the modem to the administration terminal

Introduction   Before use, the local and remote modems should be configured. The local modem is the one connected to the Meridian Mail system. This is accomplished by connecting the modem to a VT220 terminal (that is, the Meridian Mail administration terminal) and sending commands to it as described. The remote modem is the one used by offsite personnel to dial in to a Meridian Mail system that is located elsewhere.

Modem speed   *Note:* Before configuring the modem, the terminal must first be configured to the desired speed. This determines the modem's default speed when resetting or powering up.

- For modem 2400 bps access, set the terminal to 2400 bps.
- For modem 9600 bps access, set the terminal to 9600 bps.

The baud rate of the Meridian Mail CPU can be set at either 2400 bps or 9600 bps. Modems must be configured so the baud rate matches that of the terminal and the CPU's NVRAM (non-volatile memory) using the Change Speed utility. This utility is available through the System Installation and Modification menu on the Install/data tape (on the System Operation Utility menu), or in the System and Feature Dependent Utilities on the TOOLS menu. After the speed is set, the terminal and remote support modem must be reset to match the baud rate of the CPU card.

Connecting the modem   To connect the modem, follow these steps.

Step	Action
1	Connect one end of a straight RS-232 cable (NTND91AA/AB) to the 25-pin modem connector.
2	Plug the modem power cord into an AC receptacle.
3	Power on the modem.
4	Temporarily disconnect the administration terminal from the A/B switchbox.

Step	Action
5	Connect the free end of the modem cable to the terminal for the purpose of configuring the modem.
	The terminal should be set to the speed that the Meridian Mail administration terminal will be using, either 2400 bps or 9600 bps. The modem will automatically save this speed when the configuration is saved.
6	Program the modem. Refer to the appropriate section of this chapter for the modem you are programming.
7	Disconnect the administration terminal from the modem cable.
8	Reconnect the administration terminal to the A/B switchbox.
9	For a local modem, connect the free end of the modem cable to the B connector on the A/B switchbox.
10	For a local modem, connect the modem to the phone line provided for remote support.

U.S. Robotics modem

Introduction   The U.S. Robotics Sportster 14.4 modem has DIP switches on the rear (see "U.S. Robotics Sportster 14.4" on page B-8). These have to be set as indicated in the configuration instructions. The down position is the On position for the switch, and the switches are numbered from 1 through 8.

Note: The U.S. Robotics modem may be used to dial in to Meridian Mail systems using other supported local modems (for example, VenTel EC2400-33). The remote modem/terminal should only be used at 9600 bps when the local modem is capable of 9600 bps operation (for example, the U.S. Robotics modem, but not the VenTel EC2400-33) *and* the Meridian Mail local administration terminal is used at 9600 bps. In all other cases, 2400 bps should be used. This will prevent flow control problems that may otherwise occur.

Modem configuration   Refer to one of the following procedures depending on the modem configuration:

- Refer to page B-8 if you are configuring a local modem operating at either 2400 bps or 9600 bps.
- Refer to page B-9 if you are configuring a remote-access modem operating at either 2400 bps or 9600 bps.

U.S. Robotics Sportster 14.4
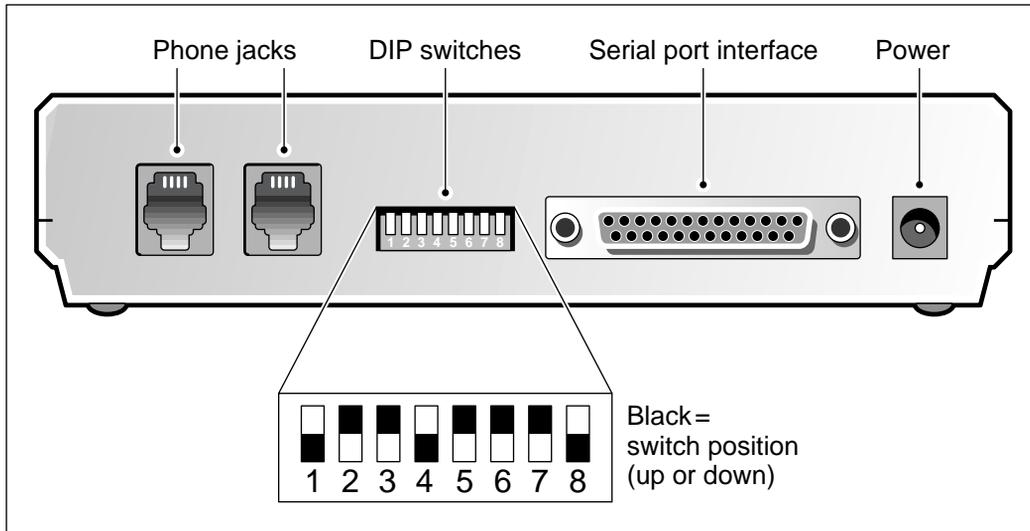
G100426

Configuring the U.S. Robotics Sportster 14.4 modem as a local modem

To configure the U.S. Robotics Sportster 14.4 modem as a local modem, follow these steps.

Step	Action
1	Power off the modem.
2	Set DIP switches 1, 3, 7, and 8 down for all programming. (All other switches should be up.)
3	Power on the modem.
4	Enter the commands below from the administration terminal to configure the modem:
	The administration terminal should be set to either 2400 bps or 9600 bps (that is, Meridian Mail console speed).
	AT&F0 <Return> (response is OK) **ATS0=1** <Return> (response is OK) **AT&B1** <Return> (response is OK) **ATY0** <Return> (response is OK) **ATQ1** <Return> (no response) **AT&W0** <Return> (no response) **AT&W1** <Return> (no response)
5	Power off the modem.

Step	Action
6	Set DIP switches 1, 4, and 8 down. (All other switches should be up.)

Configuring the U.S. Robotics Sportster 14.4 modem as a remote-access modem

To configure the U.S. Robotics Sportster 14.4 modem as a remote-access modem, follow these steps.

Note: This configuration can be used to dial in to a system with a U.S. Robotics modem. For systems with another modem, it may be necessary to modify other parameters (for example, disabling the error correction).

Step	Action
1	Power off the modem.
2	Set DIP switches 3, 5, 7, and 8 down for all programming. (All other switches should be up.)
3	Power on the modem.
4	Enter the commands below from the administration terminal to configure the modem: **AT&F0** \<Return\> (response is OK) **ATS0=0** \<Return\> (response is OK) **ATY0** \<Return\> (response is OK) **AT&M0** \<Return\> (response is OK) **AT&W0** \<Return\> (response is OK) **AT&W1** \<Return\> (response is OK)
5	Power off the modem.
6	Set DIP switches 3, 5, and 8 down. (All other switches should be up.)

Racal modem

Introduction

To configure the Racal ALM 3223 modem, use the administration terminal set up for either 2400 bps or 9600 bps operation.

Note: There are no DIP switches for this modem.

Modem configuration

Refer to one of the following procedures depending on the modem configuration that you want:

- Refer to " Configuring the Racal ALM3223 modem as a local modem" below if you are configuring a local modem operating at either 2400 bps or 9600 bps.
- Refer to "Configuring the Racal ALM3223 modem as a remote-access modem" on page B-11 if you are configuring a remote-access modem operating at either 2400 bps or 9600 bps.

Configuring the Racal ALM3223 modem as a local modem

To configure the Racal ALM3223 modem as a local modem, follow these steps.

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).

Step	Action
2	Enter the following commands from the terminal:
	AT&F <Return> (response is OK)
	AT&Y0 <Return> (response is OK)
	AT0, 0 <Return> (response is OK)
	AT1 <Return> (response is OK)
	AT0 <Return> (response is OK)
	AT&D0 <Return> (response is OK)
	AT&S2 <Return> (response is OK)
	ATS61=3 <Return>(response is OK)
	ATS43=3 <Return>(response is OK)
	ATS44=7 <Return>(response is OK)
	ATQ1 <Return> (no response)
	ATE0 <Return> (no response)
	AT&W0 <Return> (no response)
	AT&W1 <Return> (no response)

Configuring the Racal ALM3223 modem as a remote-access modem

To configure the Racal ALM3223 modem as a remote-access modem, follow these steps.

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).

Step	Action
2	Enter the following commands from the terminal:

AT&F <Return>   (response is OK)

AT&Y0 <Return>   (response is OK)

AT0, 0 <Return>   (response is OK)

AT1 <Return>   (response is OK)

AT0 <Return>   (response is OK)

ATS0=0 <Return> (response is OK)

AT&S2 <Return>   (response is OK)

ATS43=3 <Return>(response is OK)

ATS44=7 <Return>(response is OK)

AT&W0 <Return>   (response is OK)

AT&W1 <Return>   (response is OK)

Hayes modem

Introduction

To configure the Hayes Optima 144 modem, use the administration terminal set up for either 2400 bps or 9600 bps operation.

Note: There are no DIP switches for this modem.

Modem configuration

Refer to one of the following procedures depending on the modem configuration that you wish to achieve:

- Refer to the procedure below if you are configuring a local modem operating at either 2400 bps or 9600 bps.
- Refer to page B-14 if you are configuring a remote-access modem operating at either 2400 bps or 9600 bps.

Configuring the Hayes Optima 144 modem as a local modem

To configure the Hayes Optima 144 modem as a local modem, follow these steps.

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).
2	Enter the following commands from the terminal: AT&F <Return> (response is OK) AT&K2 <Return> (response is OK) ATS0=1 <Return> (response is OK) ATS37=9 <Return> (response is OK) ATS46=0 <Return> (response is OK) ATT <Return> (response is OK) ATQ1 <Return> (no response) ATE0 <Return> (no response) AT&W0 <Return> (no response) **AT&W1** <Return> (no response)

Configuring the Hayes Optima 144 modem as a remote-access modem

To configure the Hayes Optima 144 modem as a remote-access modem, follow these steps.

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).
2	Enter the following commands from the terminal:
	AT&F <Return> (response is OK)
	ATT <Return> (response is OK)
	AT&K2 <Return> (response is OK)
	ATS0=1 <Return> (response is OK)
	ATS37=9 <Return> (response is OK)
	ATS46=0 <Return> (response is OK)
	AT&W0 <Return> (response is OK)
	AT&W1 <Return> (response is OK)

UDS modems

Introduction   The following versions of UDS modems are supported in
Meridian Mail Release 13 :

- *2440*   This modem can be used as a local modem
  operating at either 2400 bps or 9600 bps, or as a remote-
  access modem operating at 2400 bps.

- *224 A/D*   This modem can be used as a local modem
  operating at either 2400 bps or 9600 bps, or as a remote-
  access modem operating at only 2400 bps.

UDS 2440 modem   The UDS 2440 modem can be configured as a local modem
operating at either 2400 bps or 9600 bps using either the
administration terminal or the front panel on the modem. (The
modem can only be configured as a remote-access modem using
the administration terminal.) The front panel of the modem
contains a small display and several buttons (YES, NO, and
TALK) that are used to configure the modem.

UDS 2440 modem—front panel
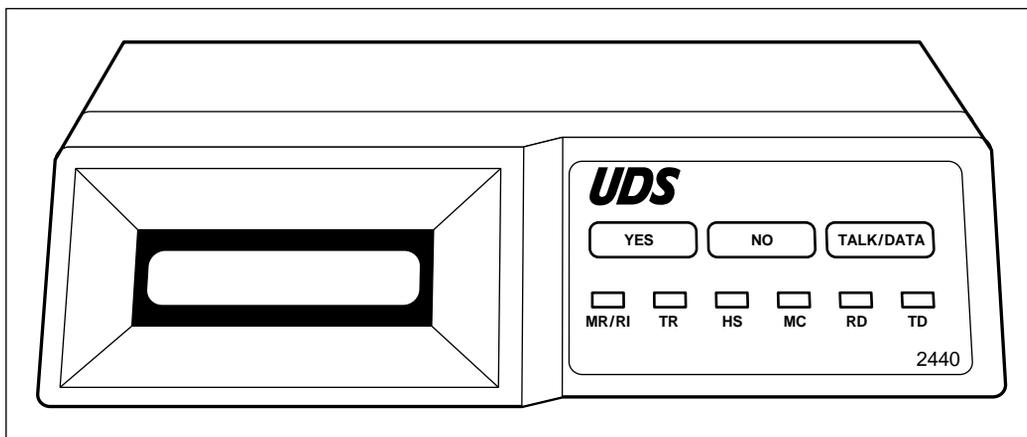
G100001

Refer to the appropriate procedure depending on the
configuration you require:

- Refer to the procedure below if you want to configure the modem as a local modem operating at 2400 bps by using the administration terminal.

- Refer to page B-17 if you want to configure the UDS 2440 modem from the front panel as a local modem operating at 2400 bps.

- Refer to page B-19 if you want to configure the modem as a local modem operating at 9600 bps from the front panel.

- Refer to page B-20 if you want to configure the modem as a local modem operating at 9600 bps using the administration terminal.

- Refer to page B-21 if you want to configure the modem as a remote-access modem operating at 2400 bps using the administration terminal.

Configuring the UDS 2440 modem as the local modem operating at 2400 bps through the terminal

To configure the UDS 2440 modem as the local modem operating at 2400 bps, using the terminal, follow these steps.

Step	Action
1	Connect the modem to a terminal using a straight-through cable.
2	Enter **at&f s14=140** <Return> from the terminal.
3	Enter **at&w** <Return>. The cursor returns to "A" on the same line. ***Note:*** This step disables the echo of the modem. Enter the following commands carefully because you will no longer see your input on the terminal screen.
4	Turn the modem off, wait ten seconds, then turn it back on.

Configuring the UDS 2440 modem as the local modem operating at 2400 bps using the front panel method

The front panel of the modem contains a small display and several buttons (YES, NO, and TALK) that are used to configure the modem.

To configure the UDS 2440 modem as the local modem operating at 2400 bps, using the front panel method, follow these steps.

Step	Action
1	Plug in the modem and turn it on.
2	Press the YES button until OFFLINE appears in the display window.
3	Press NO in response to the OFFLINE prompt.
4	Press NO to advance to the next desired prompt.
5	Enter the appropriate response for each prompt listed in the following table to configure the modem.

UDS 2440 modem configuration (front panel method)

Prompt	Response
OFFLINE	NO
DIAL?	NO
TEST	NO
AUTO ANS	NO
DATA OPTS?	NO
OPTIONS?	YES
RESET?	YES
LOADING (appears for one second)	
RESET	NO
FACTORY?	YES
FACTORY 0?	YES
LOADING (appears for one second)	
FACTORY?	NO
SPKR OPTS?	NO
TELE OPTS?	NO
PIN OPTS?	NO
MSG OPTS?	NO
SECURITY?	NO
DISC OPTS?	NO

Prompt	Response
SREGS?	NO
OPTIONS?	NO
PROTOCOL?	NO
If this configuration is different from the stored configuration, SAVE appears; otherwise OFFLINE is displayed.	
If SAVE? appears	YES
SAVING (appears for two seconds)	
OFFLINE?	NO
DIAL?	NO
TEST?	NO
AUTO ANS?	YES
AUTO ANS E?	YES
RINGS?	YES
RING= 001?	YES
AUTO ANS	NO
DATA OPTS?	NO
OPTIONS?	YES
RESET?	NO
FACTORY?	NO
SPKR OPTS?	NO
TELE OPTS?	NO
PIN OPTS?	YES
DTR OPTS?	YES
DTR OPTS 0?	NO
dtr opt 1	NO
dtr opt 2	NO
dtr opt 3	YES
DTR OPTS?	NO
DSR OPTS?	YES
DSR FORCED?	NO
DSR normal	YES
DSR OPTS?	NO
CD OPTS?	YES
CD FORCED?	NO
lo at disc	NO
cd normal	YES
CD OPTS?	NO

Prompt	Response
CTS OPTS?	NO
P 21 OPTS?	NO
P 23 OPTS?	NO
P 25 OPTS?	NO
PIN OPTS?	NO
MSG OPTS?	NO
SECURITY?	NO
DISC OPTS?	NO
SREGS?	NO
OPTIONS?	NO
PROTOCOL?	NO
If this configuration is different from the stored configuration, SAVE appears; otherwise OFFLINE is displayed.	
SAVE?	YES
SAVING (appears for two seconds)	
OFFLINE	

Configuring the UDS 2440 modem as the local modem operating at 9600 bps through the front panel

To configure the UDS 2440 modem as the local modem operating at 9600 bps, using the front panel method, follow these steps.

Step	Action
1	Press the NO button to advance to the OPTIONS? prompt.
2	Respond to the appropriate prompt as outlined in "UDS 2440 front panel prompts" on page B-20.

UDS 2440 front panel prompts

Display window prompt	Press
OPTIONS?	YES
FACTORY?	YES
Factory 3?	YES
Data OPTS?	YES
DTE OPTS?	YES
DTE RATE?	9600
DTE ECHO?	YES
ECHO d?	YES
AT' CMDS?	YES
AT' CMDS d?	YES
OPTIONS?	YES
PIN OPTS?	YES
CD OPTS?	YES
CD Normal?	YES
SAVE?	YES

3   Advance to the next prompt by pressing NO.

4   To save the configuration, press YES at the SAVE? prompt.

  Note: If you have entered incorrect information at a prompt, you need to restart your entry from the beginning. To do this, press NO for all remaining prompts. The OPTIONS prompt reappears and you can continue your entries.

  If you have already saved the configuration, start over from step 1.

Configuring the UDS 2440 modem as the local modem operating at 9600 bps through the terminal

To configure the UDS 2440 modem as the local modem operating at 9600 bps, using the terminal, follow this step.

Step	Action
1	Enter the commands in "UDS 2440 modem configuration commands" on page B-21 on the administration terminal to configure the modem.

UDS 2440 modem configuration commands

Enter the following command	System response
at&f3 <Return>	OK
at&c1 <Return>	OK
ats0=1 <Return>	OK
at e0 s14=140 <Return>	No response is seen on the terminal after this command.
at&w <Return>	

Configuring the UDS 2440 as the remote-access modem operating at 2400 bps

To configure the UDS 2440 modem as the remote-access modem operating at 2400 bps, using the terminal, follow these steps.

Step	Action
1	Connect the modem to a terminal using a straight-through cable.
2	Enter **at&f s14=140** <Return> from the terminal.
3	Enter **at&w** <Return>. The cursor returns to "A" on the same line. ***Note:*** This step disables the echo of the modem. Enter commands carefully, because you no longer see your input on the terminal screen.
4	Turn the modem off, wait ten seconds, and then turn it back on.

UDS 224 A/D modem

Refer to the appropriate procedure depending on the configuration you require:

• Refer to page B-22 to configure the UDS 224 A/D as a local modem operating at 2400 bps.

• Refer to page B-23 to configure the UDS 224 A/D as a remote-access modem operating at 2400 bps.

Configuring the UDS 224 A/D as a local modem at 2400 bps

To configure the UDS 224A/D as a local modem at 2400 bps, follow these steps.

Step	Action
1	Put the front panel rotary switch in the Data position.
2	Set the modem DIP switches as defined in the following table.
3	Connect the modem to a terminal using a straight-through cable.
4	Enter **at&f s14=140** and press <Return>. The cursor returns to "A" on the same line. *Note:* This step disables the echo of the modem. Enter the following commands carefully, because you no longer see your input on the terminal screen.
5	Enter **at&w** <Return>.
6	Turn the modem off, wait ten seconds, and then turn it back on.

UDS EC 224 A/D modem hardware configuration for a 2400 bps operation

Front panel switches		
Rotary switch: - DATA position when using terminal to dial. - TALK position when using TELSET to dial. Switch to DATA position once connected.		
Three-position toggle switch: HI position 2400 bps Speed Select		
Circuit board mount DIP switches		
Switch 1 (S1)		
S1-1	On	Attempt MNP error correction protocol
S1-2	Off	Disable DCE independent speed
S1-3	Off	Switched network
S1-4	On	Private line originate
S1-5	On	Enable auto-answer
S1-6	Off	Operate in 224 A/D mode

Front panel switches		
S1-7	Off	Disable TX space disconnect
S1-8	Off	Disable RX space disconnect
Switch 2 (S2)		
S2-1	On	8 bits no parity, 1 start, 1 stop
S2-2	Off	
S2-3	Off	
S2-4	Off	CTS DTE flow control
S2-5	On	
S2-6	Off	No DCE flow control
S2-7	Off	
S2-8	Off	Bell 212A @ 1200 bps
Switch 3 (S3)		
S3-1	Off	DTR disconnect disabled
S3-2	On	Carrier disconnect = 100mS
S3-3	Off	Disable use of CH pin
S3-4	Off	Disable DTE Analog loopback

Configuring the UDS 224 A/D as a remote-access modem at 2400 bps

To configure the UDS 224 A/D as a remote-accesss modem at 2400 bps, follow these steps.

Step	Action
1	Put the front panel rotary switch in the Data position.
2	Connect the modem to a terminal using a straight-through cable.
3	Enter **at&f &w** <Return>. Factory default settings are used for the UDS modem. For reference, see "UDS EC 224 A/D modem hardware configuration for a 2400 bps operation" on page B-22.

Ven-Tel modems

Introduction

The following versions of Ven-Tel modems are supported in Meridian Mail Release 13.0:

- *2400-33, rev. 5.2 or 6.0*   This modem can be used as a local modem operating at either 2400 bps or 9600 bps, or as a remote-access modem operating at 2400 bps.

- *2400-33 Plus II*   This modem can be used as a local modem operating at either 2400 bps or 9600 bps, or as a remote-access modem operating at 2400 bps.

- *9600 Plus/Plus II*   This modem can be used as either the local or remote-access modem but can operate only at 9600 bps.

Note: The manufacturer of these modems no longer exists.

Switches on the Ven-Tel 2400-33/2400 Plus II modem

You do not need to change the switch settings on these models if you are currently using the modem at 2400 bps and want to use it at 9600 bps. If you have not already set the switches, use the settings described below for both local and remote use.

Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem

To set the switches on the Ven-Tel 2400-33/2400 Plus II modem, follow these steps.

Step	Action
1	Remove the modem cover and verify that the E-PROM label shows version 5.2 or higher.
2	Locate the modem switch block, which may be labeled S2.

Step	Action		
3	Set the switch as follows:		
	S2-1	ON	Modem assumes data terminal ready (DTR) is on.
	S2-2	OFF	Not used.
	S2-3	OFF	Not used.
	S2-4	OFF	Not used.
	S2-5	OFF	Not used.
	S2-6	OFF	Not used.
	S2-7	ON	Speaker enabled.
	S2-8	ON	Modem will respond to commands.
	S2-9	ON	NVRAM Model command set enabled.
	S2-10	OFF	Not used.

Switches on the Ven-Tel 9600 Plus/9600 Plus II modem

If you are using the Ven-Tel 9600 Plus/Plus II modem, you must set SW2. The SW2 settings are the same for both local and remote use.

Note: The factory default settings can be used.

Setting the switches on the Ven-Tel 9600 Plus/Plus II modem

To set the switches on the Ven-Tel 9600 Plus/Plus II modem, follow this step.

Step	Action
1	Set SW2 according to "Settings for SW2 for the Ven-Tel 9600 Plus modem" on page B-26.

Settings for SW2 for the Ven-Tel 9600 Plus modem

SW2		Setting
1	Force CTS/Override &R command	ON
	CTS Follows &R command	**OFF**
2	CD Forced/Override &C command	ON
	CD Follows &C command	**OFF**
3	DSR Forced/Override &S command	ON
	DSR Follows &S command	**OFF**
4	Disable AT Commands	ON
	Enable AT Commands	**OFF**
5	4-Wire Leased Line (9600 Plus II)	ON
	2-Wire Leased Line	**OFF**
6	Modem Reset	See note.
7	Not used	
8	Not used	
Note: SW2-6 is used to reset the modem to the asynchronous command mode if &M2, &M3, &M6, or &M7 is set. To reset the modem from synchronous to asynchronous, SW2-6 must be turned ON prior to powering up. In addition, the SW2-6 switch may be used to reset the modem if an improper *V command string is used.		

Switches on the Ven-Tel 9600 Plus II modem

If you are using the Ven-Tel 9600 Plus II modem, you must set both SW2 and SW6. The SW2 settings are the same for both local and remote use.

Setting the switches on the Ven-Tel 9600 Plus II modem

To set the switches on the Ven-Tel 9600 Plus II modem, follow these steps.

Note: The factory default settings can be used.

Step	Action
1	Set SW2 as described in "Setting the switches on the Ven-Tel 9600 Plus/Plus II modem" on page B-25.
2	Set SW6 according to "Settings for SW6 for the Ven-Tel 9600 Plus II modem" on page B-27.

Settings for SW6 for the Ven-Tel 9600 Plus II modem

SW6		Setting
1	Telset Enable	ON
	Telset Disable	**OFF**
2	Telset Enable	ON
	Telset Disable	**OFF**
3	Telco J3 M1 Enabled/A Disabled	ON
	Telco J3 M1 Disabled/A Enabled	**OFF**
4	J3 MIC Enabled/A1 Disabled	ON
	J3 MIC Disabled/A1 Enabled	**OFF**

Configuring the Ven-Tel 2400-33/2400 Plus II as a local 9600 bps modem

The Ven-Tel 2400-33/2400 Plus II modem can be configured for 9600 bps operation through the administration terminal.

To configure the Ven-Tel 2400-33/2400 Plus II as a local 9600 bps modem, follow these steps.

Step	Action
1	Set the switches according to "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24.
2	Enter the commands from the following table.

Ven-Tel 2400-33/2400 Plus II modem configuration commands

Enter the following command	System response
at&f <Return>	OK
at&c1<Return>	OK
at&d0 <Return>	OK
at3 <Return>	OK
at0 <Return>	OK
at11 <Return>	OK
ats0=1 <Return>	OK
ats64=1 <Return>	OK
at e0 s14=12 <Return>	No response is seen on the terminal after this command.
at&w <Return>	

Configuring the Ven-Tel 9600 Plus/9600 Plus II as a local 9600 bps modem

The Ven-Tel 9600 Plus/9600 Plus II modem can be configured for 9600 bps operation through the administration terminal.

To configure the Ven-Tel 9600 Plus/9600 Plus II as a local 9600 bps modem, follow these steps.

Step	Action
1	Set the switches according to "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24 or "Setting the switches on the Ven-Tel 9600 Plus/Plus II modem" on page B-25, depending on the modem.
2	Enter the commands from the following table.

Ven-Tel 9600 Plus/9600 Plus II modem configuration commands

Enter the following command	System response
at&f <Return>	OK
at&c1 <Return>	OK
at3 <Return>	OK
at0 <Return>	OK
at%f2 <Return>	OK
at0 <Return>	OK
ats0=1 <Return>	OK
ate0 q1 <Return>	No response is seen on the terminal after this command.
at&w <Return>	

Configuring the Ven-Tel 2400-33/2400 Plus II as a local 2400 bps modem

The Ven-Tel 2400-33/Plus II modem can be used as a remote-access modem operating at 2400 bps. If you have not already set the switches, use the settings described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24 for both local and remote use.

You do not need to change the switch settings on a VenTel modem if you are currently using the modem for 2400 bps operation. If you have not already set the switches, use the settings described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24 for both local and remote use.

To configure the Ven-Tel 2400-33/2400 Plus II as a local 2400 bps modem, follow these steps.

Step	Action
1	Ensure that the switches are set as described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24.
2	Connect the modem to a terminal using a straight-through cable.
3	Enter **at&f &d3 &c1 1 3 s0=1 s64=1 s14=12** <Return>. ***Note 1:*** If the console port speed is set for 1200 bps, configure the modem with **0** instead of **1**. ***Note 2:*** This step disables the echo of the modem. Enter the following command carefully because you will no longer see your input on the terminal screen.
4	Enter **ate0 &w** <Return>.
5	Turn off the modem for ten seconds and then it turn back on.

Configuring the Ven-Tel 2400-33/2400 Plus II as a remote-access 2400 bps modem

The Ven-Tel 2400-33/Plus II modem can be used as a remote-access modem operating at 2400 bps. If you have not already set the switches, use the settings described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24 for both local and remote use.

To configure the Ven-Tel 2400-33/2400 Plus II as the remote-access 2400 bps modem, follow these steps.

Step	Action
1	Ensure that the switches are set as described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-24.
2	Connect the modem to a terminal using a straight-through cable.
3	Enter **at&f** <Return>.
4	Enter **at&f 3 &c1 s14=170** <Return>.
5	Enter **at&w** <Return>.
6	Turn off the modem for ten seconds and then it turn back on.

Configuring the Ven-Tel 9600 Plus/9600 Plus II as a remote-access 9600 bps modem

To configure the Ven-Tel 9600/9600 Plus II as a remote-access 9600 bps modem, follow these steps.

Step	Action
1	Connect the modem to a terminal using a straight-through cable.
2	Enter **at&f** <Return>.
3	Enter **at&f 3 &c1 s14=170** <Return>.
4	Enter **at&w** <Return>.
5	Turn off the modem for ten seconds and then turn it back on.

Appendix C

Meridian 1 configuration

In this chapter

Introduction to programming the Meridian 1 data link

Introduction

This appendix explains how to select and program an appropriate value for the Meridian Mail AML link in the Meridian 1 configuration record.

Overview of the data link

Before selecting the required values for the link, it is helpful to understand the concept behind them. This will make programming the Meridian 1 easier.

When handling a telephone call, Meridian Mail receives information about the call from the Meridian 1. That is, Meridian Mail must know the number that was dialed, whether the call was internal or external, and so on. All this information is passed on by the switch (Meridian 1) to Meridian Mail through the data link.

In the same way, Meridian Mail sends information back to the switch through the same link. For example, if the caller thru-dials to another number, Meridian Mail passes this number back to the switch to transfer the call.

This data link is the Application Module Link (AML), known also as the Integrated Services Digital Network/Application (ISDN/AP) link or the Command and Status Link (CSL). Without the AML, Meridian Mail does not have enough information to process the call correctly.

Establishing the AML data link involves installing the hardware and programming the link in the Meridian 1 software by modifying the configuration record in LD 17.

Data link hardware requirements

Introduction

You need the following hardware to establish the link:

- MSDL card or ESDI card that occupies a slot in a common equipment module of the Meridian 1
- cabling from the MSDL or ESDI card to the Meridian Mail backplane

The MSDL and ESDI cards are both I/O cards that serve as the interface from the Meridian 1 to Meridian Mail.

MSDL card

The MSDL card is a major enhancement over previous I/O cards in that it has four physical port connections but requires only one device number (DNUM) from the system. The device number identifies the ESDI port in all Meridian error and command messages. The range of device numbers is 0–15 inclusive.

ESDI card

The ESDI has two ports. Each port is assigned a device number (DNUM) (range 0–15) in Overlay 17. There are two important criteria to consider when determining and programming the DNUMs for the ESDI card:

- The two numbers must be consecutive.
- The two numbers must start with an even number.

The maximum possible devices on the Meridian 1 is 16. Therefore, the ESDI port device numbers are one of the following pairs:

0 and 1	4 and 5	8 and 9	12 and 13
2 and 3	6 and 7	10 and 11	14 and 15

The even number of the pair must be assigned to the J1 port of the ESDI card. The odd number is then assigned to the J2 port.

Programming the ESDI card

Device numbers are selected on the ESDI card by setting SW2. See the following table.

Switch settings for device address (DNUM) on ESDI card

Device address (DNUM pair) (set to ADAN prompt in Overlay 17)	Setting for SW2 (0=ON; 1=OFF)
0-1	0 0 0 1
2-3	0 0 1 1
4-5	0 1 0 1
6-7	0 1 1 1
8-9	1 0 0 1
10-11	1 0 1 1
12-13	1 1 0 1
14-15	1 1 1 1

Data link software requirements

Introduction

You must select three values to program the AML link: a device number (DNUM), Application Module Links (AMLs), and value added server identifiers (VSIDs). All three are selected in LD 17 of the Meridian 1 database in response to these three LD 17 prompts:

- ADAN AML x   link identifier assigned to the Meridian Mail AML link
- DNUM x   device number for a port on the ESDI card
- VSID x   value added server ID associated with the AML

However, before you can program the card, you need to know which device numbers, if any, have already been assigned. This is determined by reviewing the configuration record to see which numbers are already in use.

Reviewing the configuration record

The configuration record (CFN) is used to set all switch operation parameters. All the information you need to determine device numbers (DNUMs), AML, and VSID numbers is in this record. It is, therefore, important to print the configuration record before programming the link to see which numbers are available. If the existing programming permits, try to program all three numbers (DNUM, AML, VSID) as the same number.

"Example of a configuration record showing DNUM, AML, and VSID numbers" on page C-9 is an excerpt from an Option 81 configuration record with explanatory notes in the right column. The summary notes outline some key points to keep in mind when responding to the prompts in Overlay 17.

Points to consider when programming in Overlay 17

1. There are 16 possible I/O device connections to the Meridian 1.

2. Each I/O device requires programming in Overlay 17 at the ADAN prompt. ADAN TTYs are system terminals, ADAN AMLs are Application Module Links, and ADAN DCHs

are D-channels. See "I/O card type, DNUM, AML, and VSID requirements" on page C-8.

3. Each AML must be associated with a VSID, but more than one AML can be associated with a single VSID.

4. Device numbers (DNUMs) are associated with each physical card and *cannot* be duplicated among device types. AML and VSID numbers are logical numbers and *can* be duplicated between device types.

5. System terminals/TTYs require any type of SDI card or even-numbered port on a DCHI card.

6. D-channels require a DCHI card in the Meridian 1 (odd-numbered port only) or an MSDL card (any port).

7. AMLs require an MSDL or ESDI card.

8. The Option 81 switch needs two I/O devices (TTYs) to be programmed on the Call Processor cards in its cores. The device numbers are for both cores. These allow access to the cores from the backplane for maintenance purposes. The active core has access to these ports. Port 0 is for a modem, port 1 is for a TTY. These ports are in addition to the system terminal.

9. Each TTY number is a logical number and uses the same number as a device type. For example, TTY1 can only be assigned a DNUM of 1. In addition to the administration terminal normally programmed on device numbers 0 and 1 (as TTYs 0 and 1 in the configuration table), the Option 81 switch requires two additional ports/device numbers from the possible 16 ports allowed.

When printing out an Option 81 configuration table in LD 22, these two ports will be programmed as ADAN TTYs on card type CPSI and will not indicate a DNUM in their programming (see "Example of a configuration record showing DNUM, AML, and VSID numbers" on page C-9). Even though the DNUM is not listed in the programming as associated with the TTY, these ports/devices always take the same device number as the TTY number. Therefore, each time you see an ADAN TTY programmed in the configuration record, you know that its corresponding

device number, whether it appears in the programming or not, will be the same as the TTY number assigned.

10. The ESDI card is physically addressed by a switch block on the card (SW2).

11. You may want to reorganize/renumber the devices in the CFN. If you want to omit an AML number without omitting its associated programming (Overlay 23), build another AML (assign it a new number) and associate it with the same VSID as the AML you want to omit. Then, the system will allow you to omit the original one without deleting Overlay 23 programming that associates the ACD queue with the VSID.

I/O card type, DNUM, AML, and VSID requirements

I/O card type (CTYP)	Number of DNUMs to program in CFN	Device numbers used*	Physical ports associated with the DNUMs**	Device type and number associated with it	Range of VSIDs assigned to card type
SDI	1 DNUM	1 DNUM, 0–15	1	TTY 0–15	NA
SD12	2 DNUMs	2 DNUMs—must be consecutive and start with an even number	2	TTY 0–15	NA
SD14	4 DNUMs	4 DNUMs—must be consecutive and start with an even number	4	TTY 0–15	NA
XSDI	2 DNUMs	2 DNUMs—must be consecutive and start with an even number	2	TTY 0–15	NA
ESDI	2 DNUMs	2 DNUMs—must be consecutive and start with an even number	2	AML 0–15	0-15
MSDL	1 DNUM	1 DNUM, 0–15	4	AML 0–15	0-15
MSPS (Opt 21E only)	1 DNUM	1 DNUM, 0–15	1	TTY 0–15	NA
DCHI	2 DNUMS	2 DNUMs—must be consecutive and start with an even number	2	DCH 0–64	NA
CYPSI	2 DNUMS	2 DNUMs, 0–15 (0= modem, 1=TTY)	2	TTY 0–15	NA
* Device numbers used from the 16 I/O device numbers available per switch					
** The number of physical devices you can install on this card					

Example of a configuration record showing DNUM, AML, and VSID numbers

. . .	**(A, C, F)** ADAN AML 6 CTYP ESDI GRP 0	**(G)** VSID 06 DLOP AML 06 SECU NO

(A) ADAN TTY 0
CTYP SD12
GRP 0
(B) DNUM 0
FLOW NO
USER MTC TRF
    SCH
XSM NO
(A) ADAN TTY 1
CTYP SD12
GRP 0
(B) DNUM 1
FLOW NO
USER MTC TRF
    SCH
XSM NO
	(B) DNUM 6
	DES MODMAIL
	BPS 4800
	CLOK EXT
	IADR 003
	RADR 001
	T1 04
	T2 010
	T3 010
	N1 128
	N2 08
	K 7
	RXMT 05
	CRC 10
	ORUR 005
	ABOR 005
		INTL 0001
		MCNT 9999
		CONF DIR
		.
		.
		.
		Notes:
		(A) Six I/O devices are programmed in this configuration record.
		(B) Four device numbers (DNUMs) are taken (0 & 1, 2 & 3, 4 & 5, 6 & 7).
		(C) The Meridian Mail data link is programmed as an ADAN AML. Its AML is 6, and its DNUM is 6.
		(D) From this configuration, the DNUMS available to assign to a new I/O card are 8 & 9, 10 & 11, 12 & 13, 14 & 15.

(A) ADAN TTY 2
CTYP CPSI
PORT 0
BPS 9600
PRTY NONE
STOP 1
BITL 8
FLOW NO
USER MTC TRF
      SCH BUG
XSM NO
A) ADAN TTY 3
CTYP CPSI
PORT 1
BPS 9600
PRTY NONE
STOP 1
BITL 8
FLOW NO
USER MTC TRF
      SCH BUG
XSM NO
	(A) ADAN DCH 4
	CTYP DCHI
	GRP 0
	(B) DNUM 5
	DES PRI
	USER PRI
	DCHL 2
	OTBF 32
	DRAT 64KC
	CLOK EXT
	IFC SL1
	SIDE NET
	RLS ID 18
	T23 20
	T200 3
	T203 10
	N200 3
	N201 260
	K7
		(E) DNUM 5 is NOT available because each DCHI card (as well as the ESDI card) captures a pair of ports whether assigned in the software or not.
		(F) Notice the ADAN AML programming. The card type (CTYP) is ESDI. (It could be MSDL if this system uses this type of I/O card.) The DNUM is 6. All other prompts following ADAN AML 6 represent the parameters set for the Meridian Mail data link.
		(G) Notice the VSID prompt that follows the ADAN AML 6 programming. Each Meridian Mail data link (AML) requires that a VSID be assigned to it. The VSID programming here associates ADAN AML 6 and DNUM 6 with VSID 6. Remember that each DNUM is unique. However, AMLS and VSIDs are logical numbers and therefore can be the same. For example, you can have an AML 6, a TTY6, and a DCH 6, but they must all have different DNUMs assigned.
		(H) If possible, make all three numbers for each data link the same if the existing programming allows it.

Appendix D

Enhanced MMP40 and MMP40 troubleshooting flowcharts

In this chapter

Overview

Introduction   The following charts can help you determine causes and
                          solutions for potential problems with the Enhanced MMP40 (or
                          MMP40) card. Start from the first chart, and follow through the
                          others until you have localized the problem. When directed to
                          the double-letter options (AA, BB, CC, and so on), refer to the
                          tables following the flowcharts.

Enhanced MMP40 or MMP40 troubleshooting flowcharts
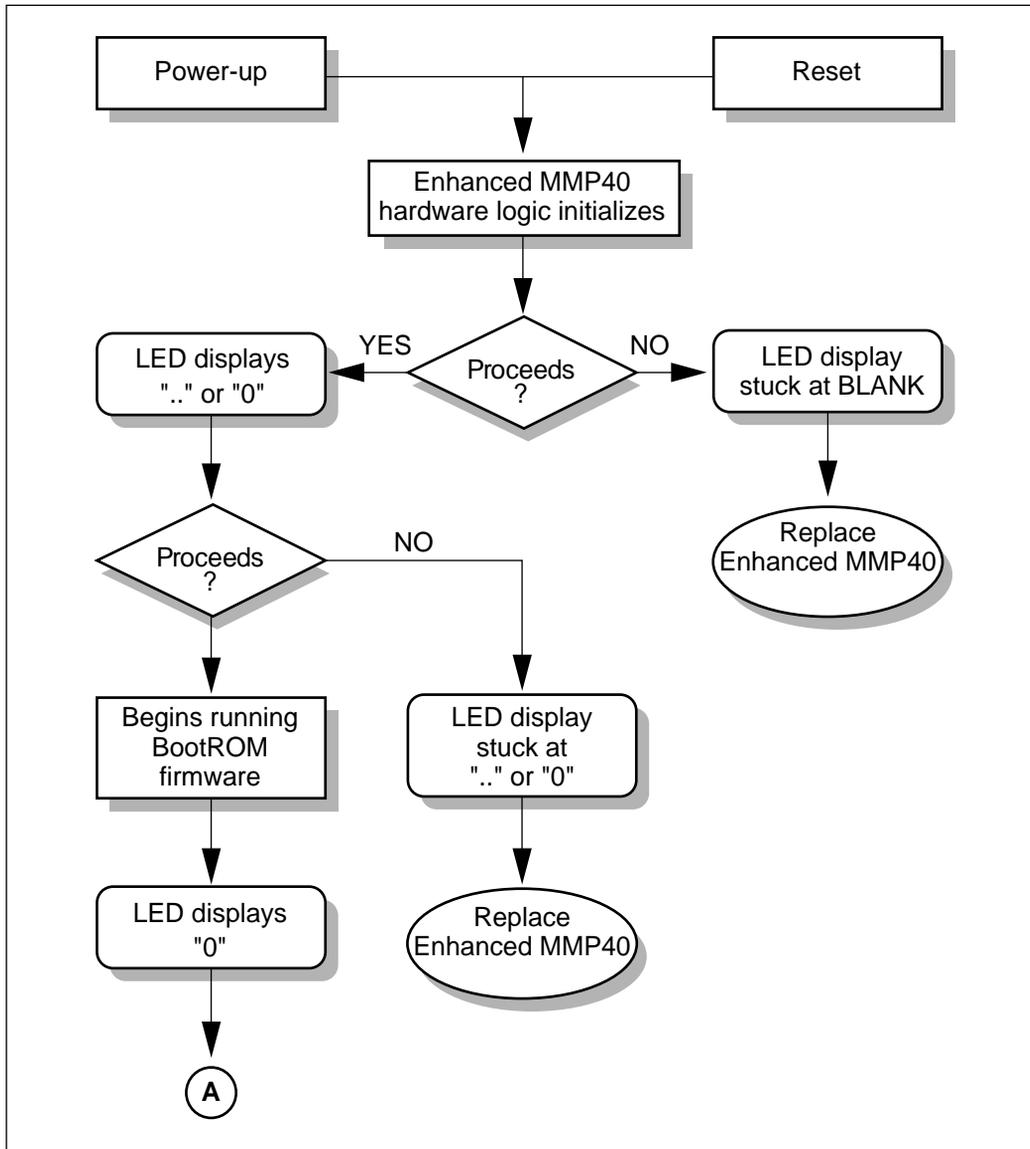
```
┌─────────────────┐                              ┌─────────────────┐
│    Power-up     │──────────────┬───────────────│      Reset       │
└─────────────────┘              │               └─────────────────┘
                                 ▼
                    ┌─────────────────────┐
                    │   Enhanced MMP40     │
                    │ hardware logic initializes │
                    └─────────────────────┘
                                 │
                                 ▼
┌─────────────────┐   YES    ╱───────╲    NO    ┌─────────────────┐
│  LED displays   │◄─────────  Proceeds  ───────►│  LED display    │
│   ".." or "0"   │          ╲    ?    ╱         │ stuck at BLANK  │
└─────────────────┘           ╲───────╱          └─────────────────┘
         │                                                │
         ▼                                                ▼
    ╱───────╲          NO                         ╱─────────────╲
   ╱ Proceeds ╲──────────────────┐               │   Replace    │
   ╲    ?     ╱                   │               │ Enhanced MMP40│
    ╲───────╱                     │                ╲─────────────╱
         │                        │
         ▼                        ▼
┌─────────────────┐     ┌─────────────────┐
│ Begins running  │     │  LED display    │
│    BootROM      │     │   stuck at      │
│   firmware      │     │   ".." or "0"   │
└─────────────────┘     └─────────────────┘
         │                        │
         ▼                        ▼
┌─────────────────┐       ╱─────────────╲
│  LED displays   │       │   Replace    │
│      "0"        │       │ Enhanced MMP40│
└─────────────────┘        ╲─────────────╱
         │
         ▼
       ╱───╲
      │  A  │
       ╲───╱

                                                          G100425/A
```

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
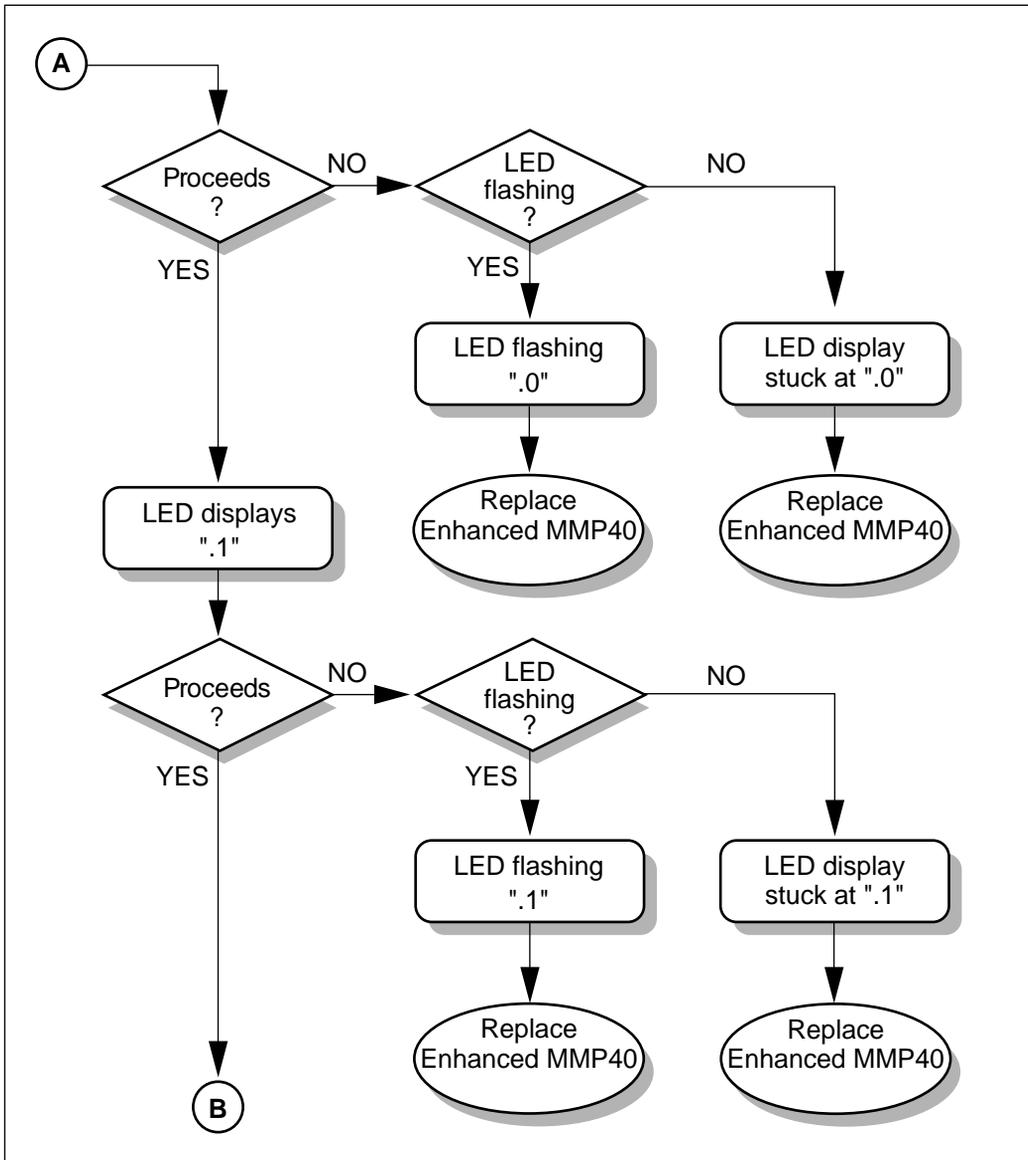
G100425/B

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
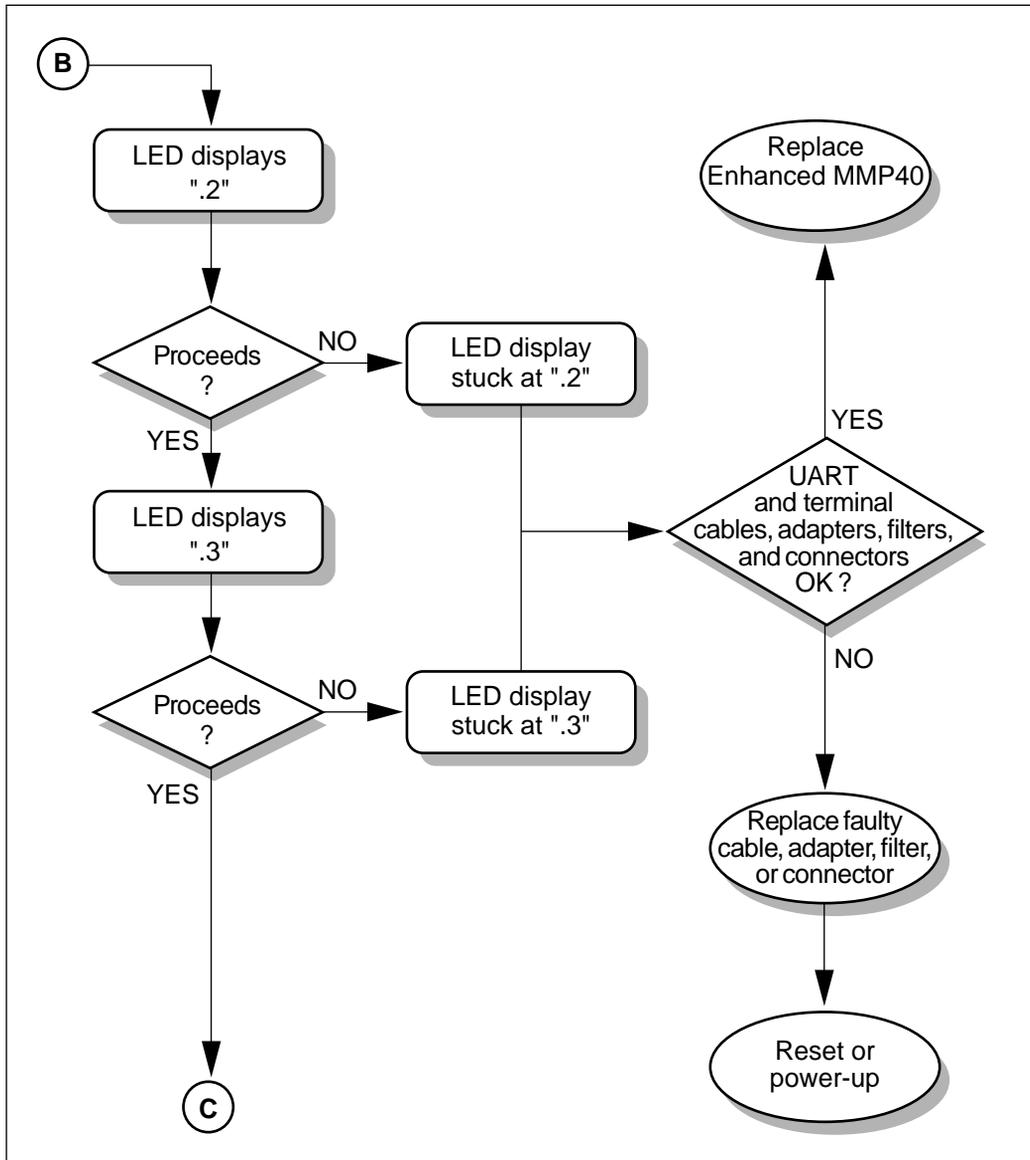
G100425/C

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
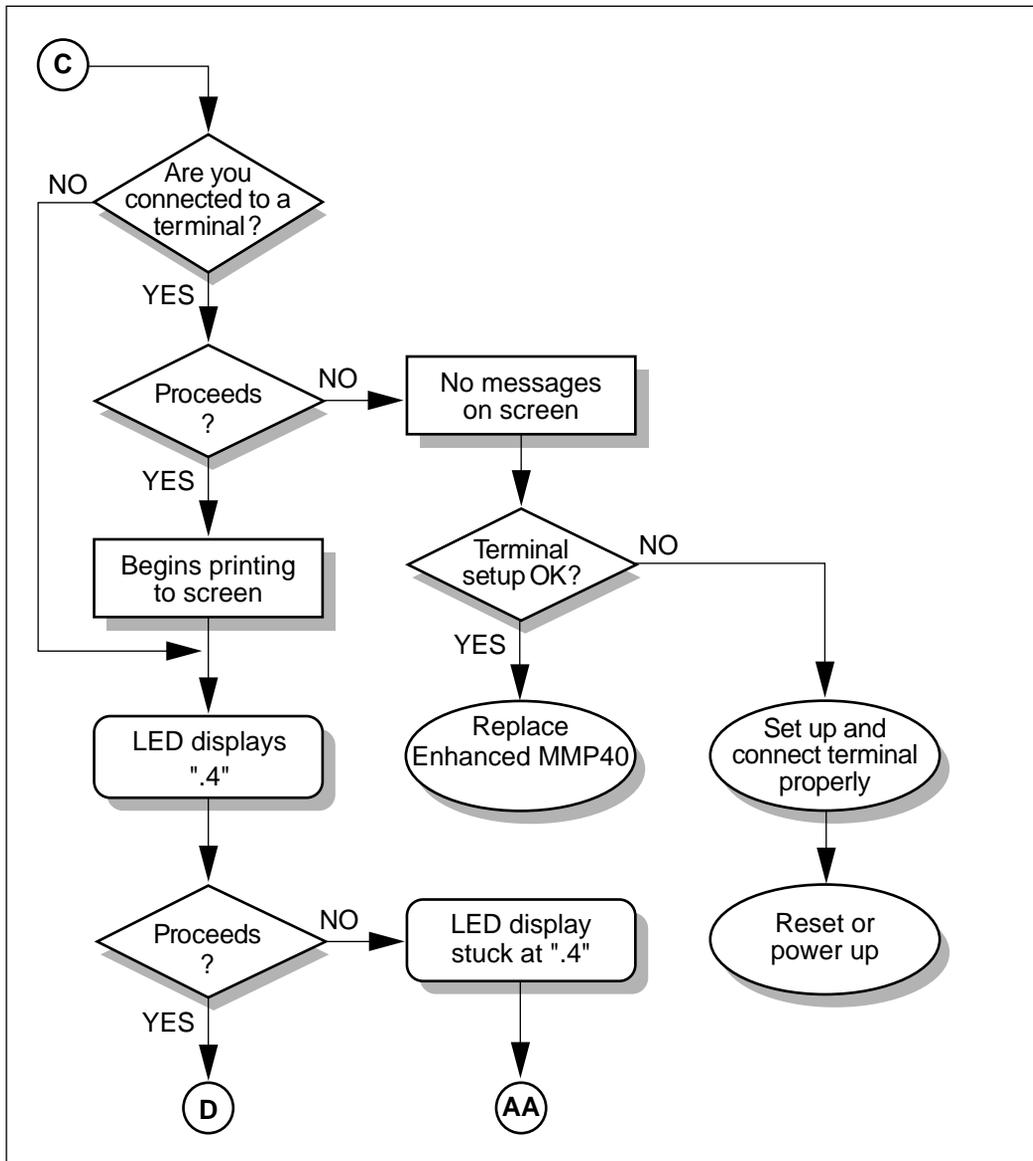
G100425/D

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)

```
   ┌─D─┐─────────────────┐
                          │
                          ▼
                  ┌────────────────┐
                  │  LED displays  │
                  │      ".5"      │
                  └────────────────┘
                          │
                          ▼
                      ◇ Prime ◇        NO
                      ◇ node? ◇───────────────────┐
                          │                        │
                        YES                        ▼
                          │               ┌────────────────┐
                          ▼               │  LED displays  │
              NO      ◇ Proceeds ◇        │      ".5"      │
         ┌────────────◇    ?     ◇        └────────────────┘
         │                │                        │
         │              YES                        ▼
         ▼                │               ◇ Proceeds ◇      NO
┌──────────────┐         ▼                ◇    ?     ◇───────────┐
│ LED display  │  ┌────────────┐              │                   │
│ stuck at ".5"│  │ Diagnostics│            YES                   │
└──────────────┘  │   begin    │                                 │
         │        └────────────┘                                 │
         │                │                                      │
         │                ▼                                      ▼
         │        ┌────────────────┐              ┌──────────────┐
         │        │  LED displays  │              │ LED display  │
         │        │ sequentially   │              │ stuck at ".5"│
         │        │ from ".0." to  │              └──────────────┘
         │        │     ".C."      │                     │
         │        └────────────────┘                     │
         │                │                              │
         ▼                ▼                 ▼            ▼
       (BB)             (E)              (F)          (CC)
```
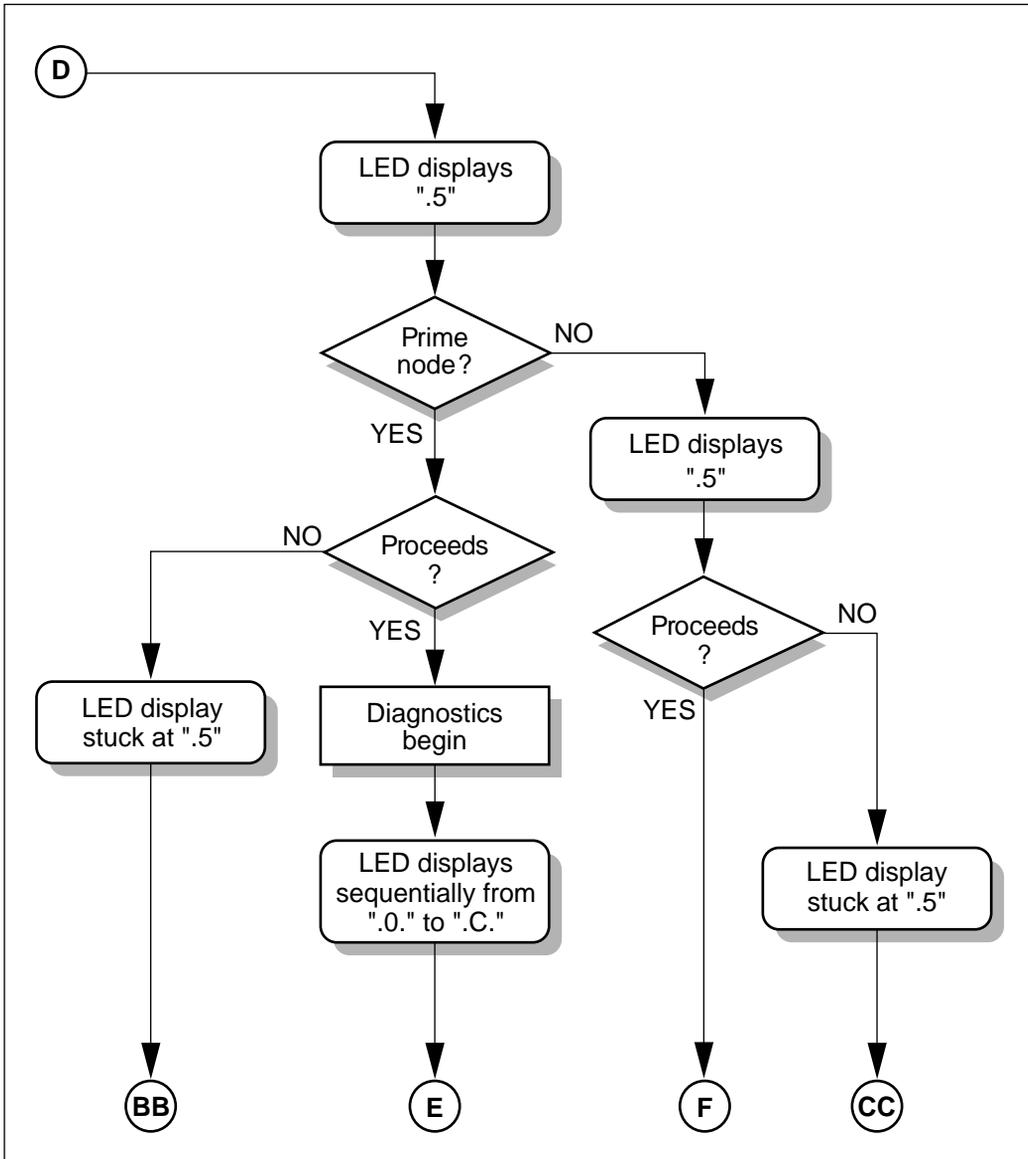
G100425/E

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
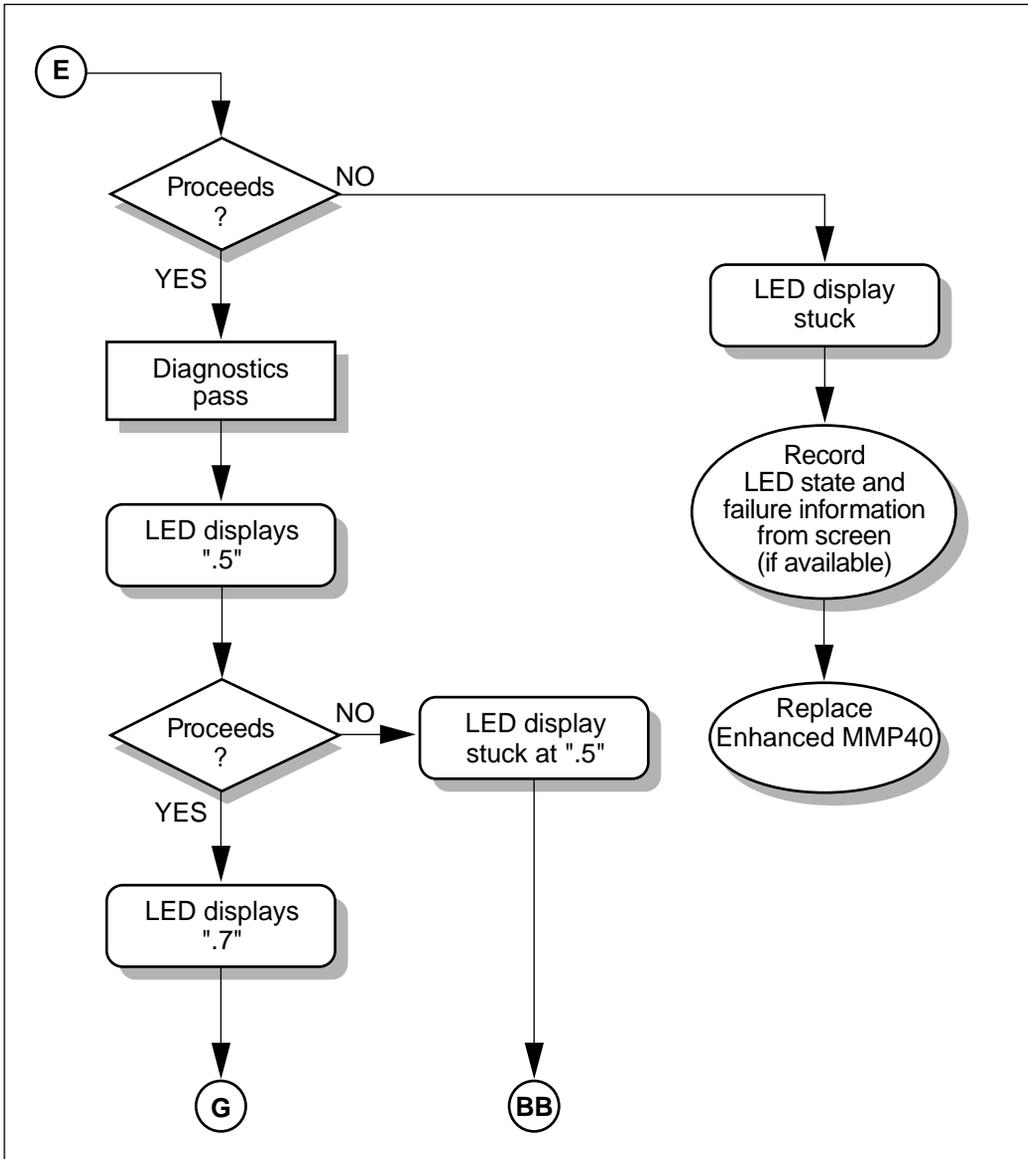
G101112

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)

```
        ( F )──────────────┐
                           │
                           ▼
                    ┌──────────────┐
                    │ LED displays │
                    │    ".6"      │
                    └──────────────┘
                           │
          ┌────────────────┤
          │                ▼
          │          ╭──────────╮
          │          │  Wait    │
          │          │  2 min   │
          │          ╰──────────╯
          │                │
          │                ▼
     NO   ╱◇◇◇◇◇◇◇◇◇◇╲   YES
    ◄─────◇  Timeout  ◇───────────────────────┐
          ╲    ?     ╱                         │
           ◇◇◇◇◇◇◇◇◇                           │
                │ NO                           │
                ▼                              │
          ╱◇◇◇◇◇◇◇◇◇◇╲                         │
          ◇   PRM    ◇   NO                    │
          ◇ takes    ◇────────────────►        │
          ◇ control  ◇                         │
          ╲    ?     ╱                         │
           ◇◇◇◇◇◇◇◇◇                           │
                │ YES                          ▼
                ▼                       ┌──────────────┐
          ╱◇◇◇◇◇◇◇◇◇◇╲                 │Enhanced MMP40│
          ◇   Do     ◇                 │   resets     │
          ◇info SEERs◇                 └──────────────┘
          ◇indicate PRM◇
          ◇reset non-prime◇
          ◇  node?   ◇
           ◇◇◇◇◇◇◇◇◇
                │ YES
                ▼
              ( H )
```
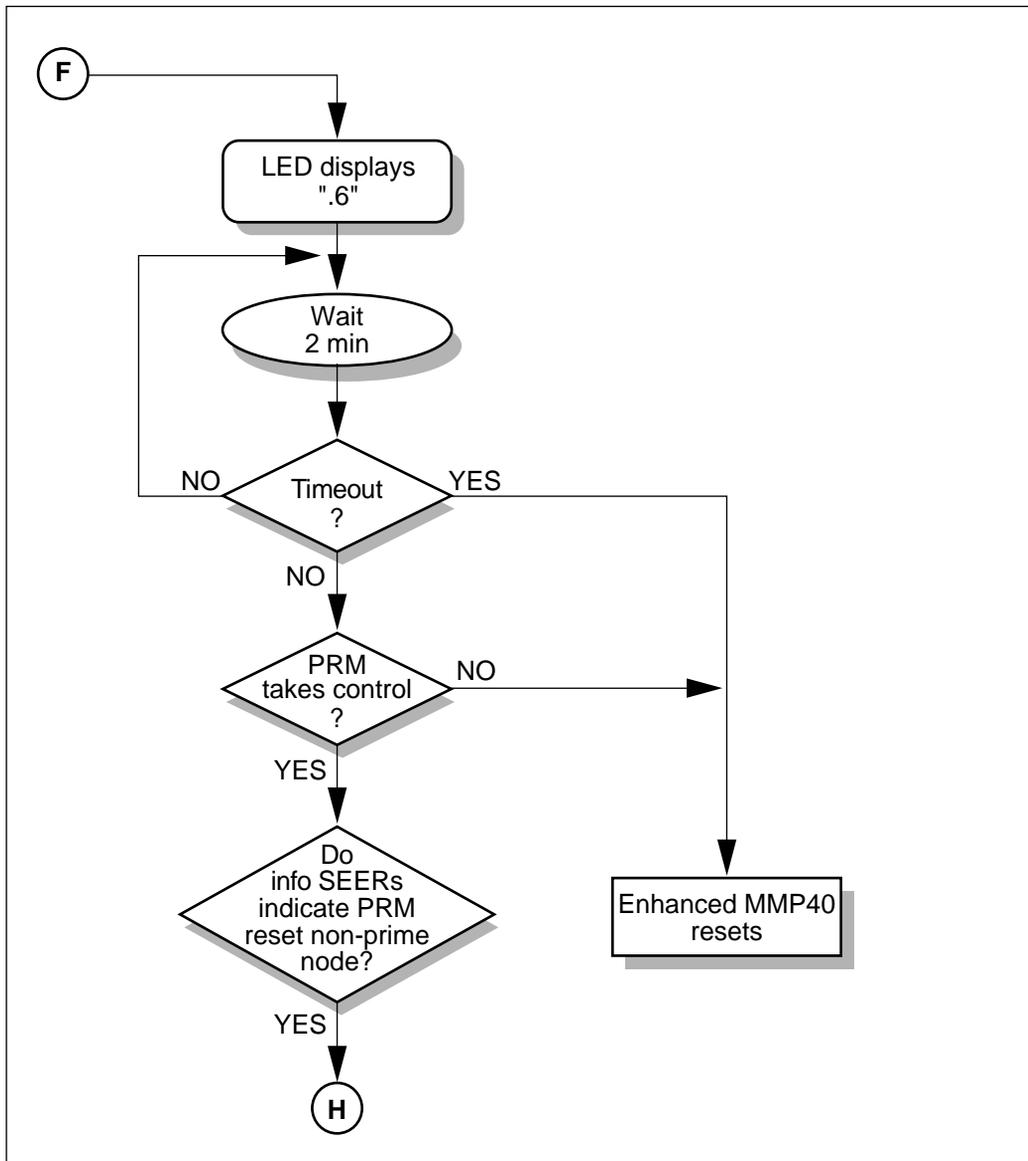
G100425/G

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
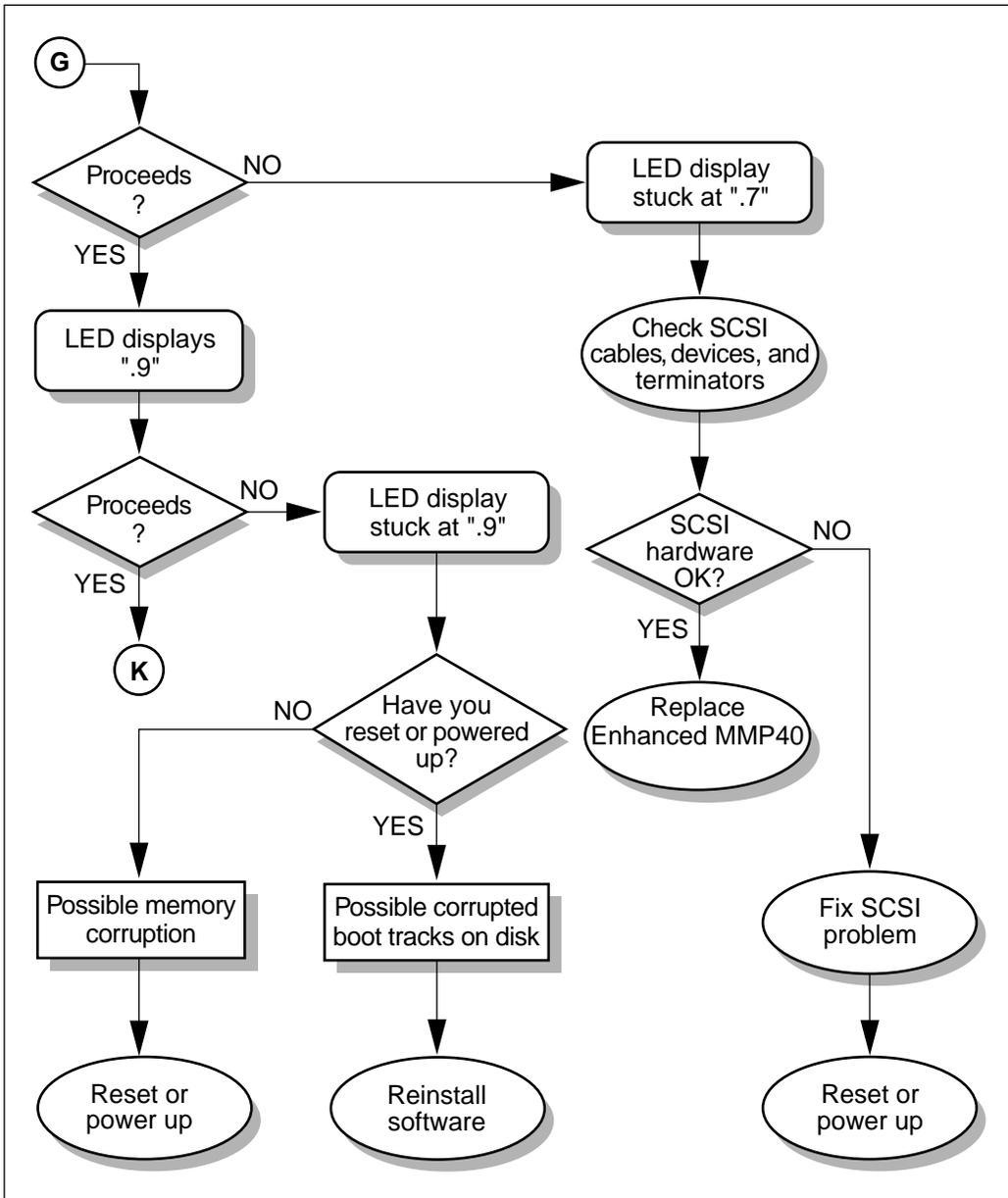
G100425/H

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
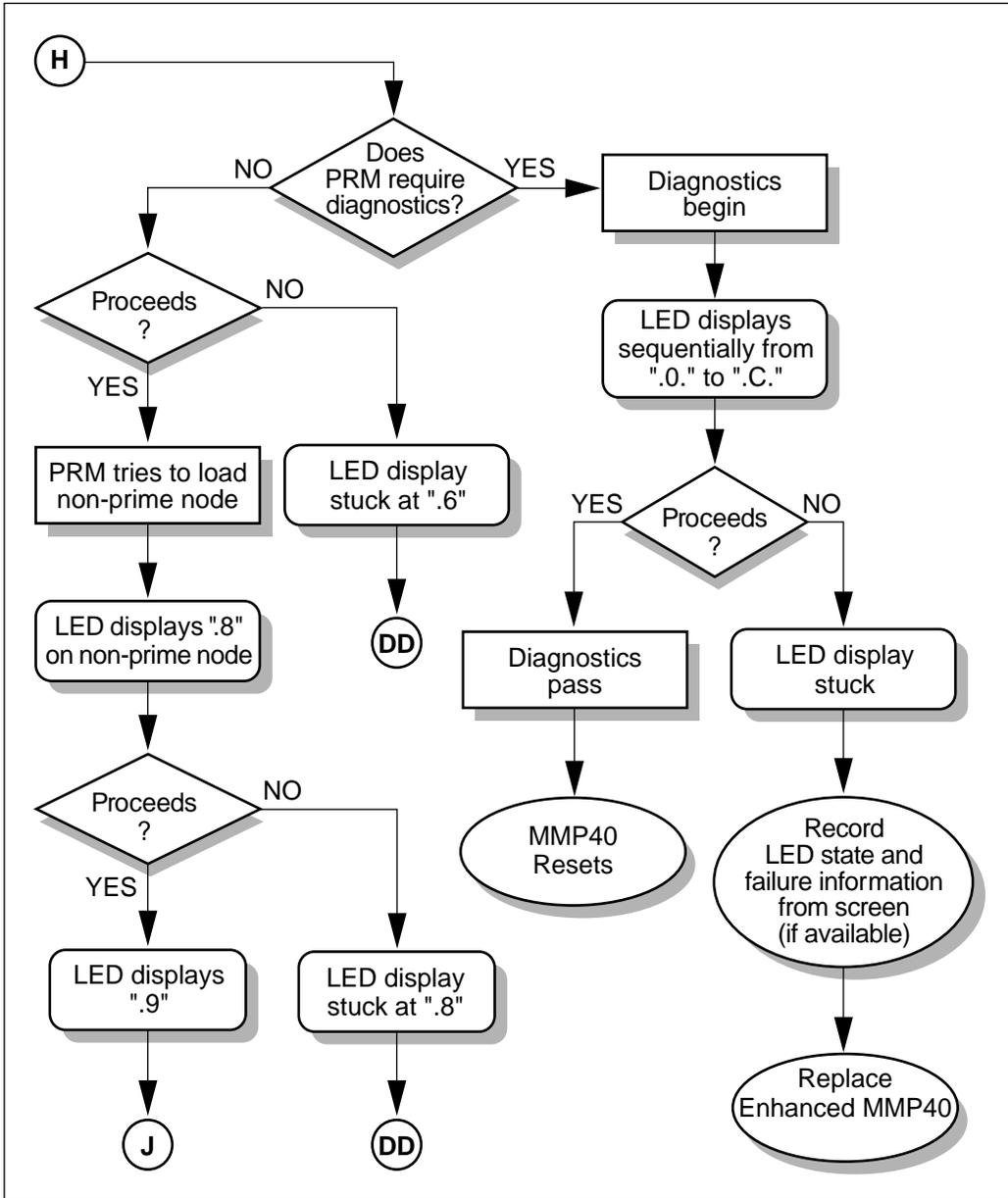
G101113

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
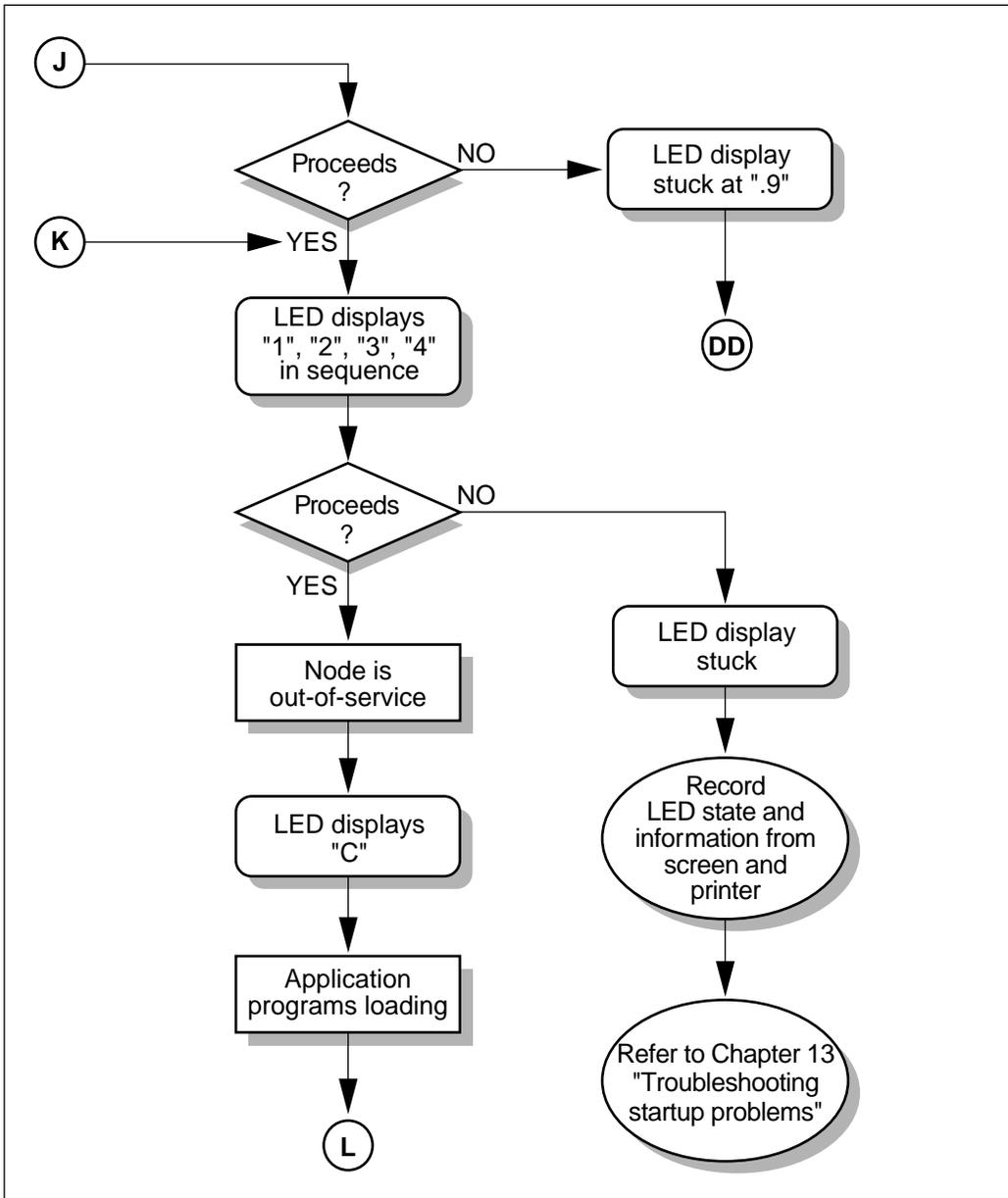
G100425 / J

Enhanced MMP40 or MMP40 troubleshooting flowcharts (continued)
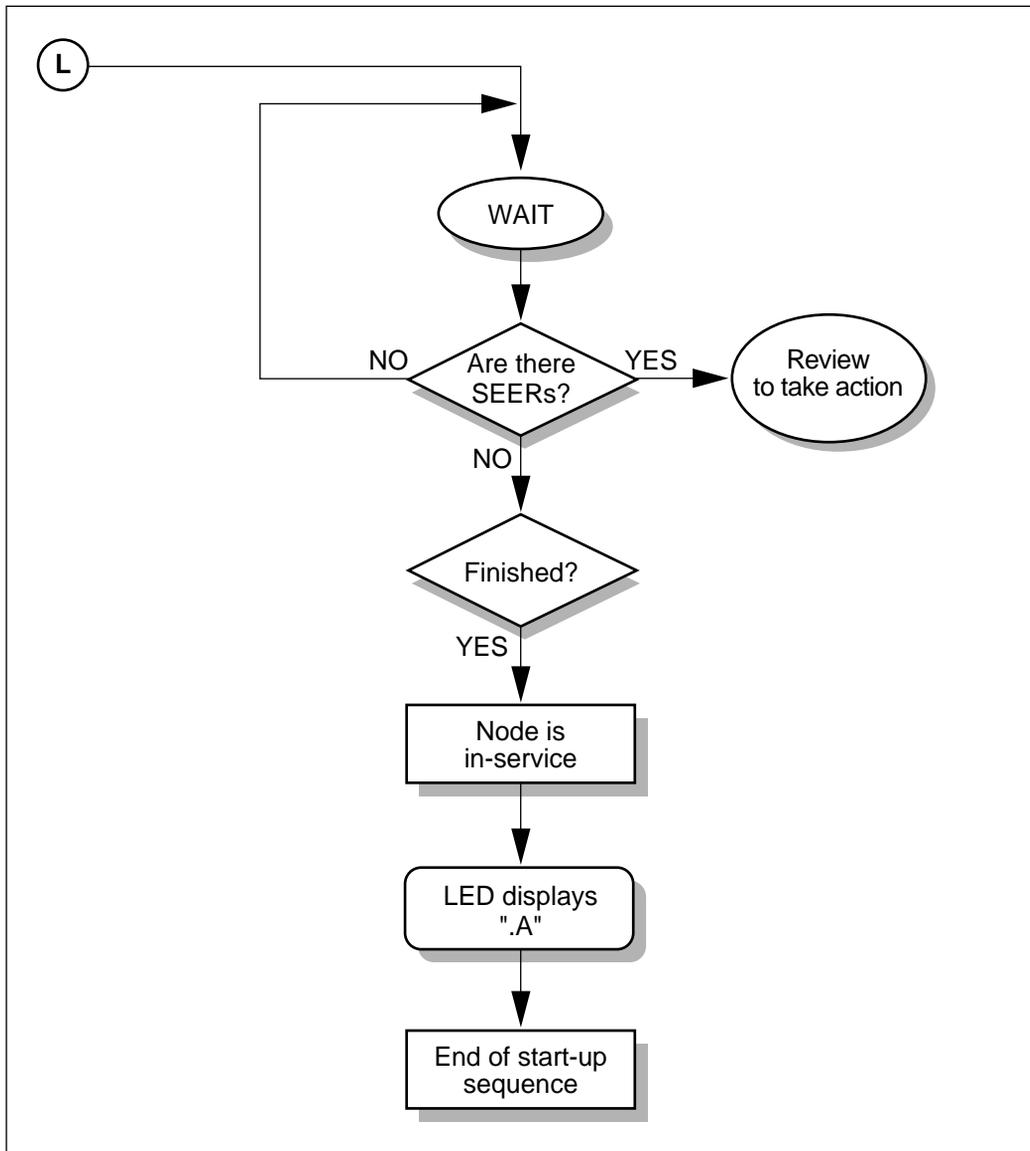
G101114

AA—LED stuck at ".4"

Possible causes	Recovery action
Ctrl-B or BREAK key was pressed, or terminal was powered up during startup sequence.	Reset or power up node again.
A peripheral card such as a VP or Utility card on the same node is faulty.	Replace the faulty card.
Enhanced MMP40 (or MMP40) card may be faulty.	Record messages on screen. Replace Enhanced MMP40 (or MMP40) card.

BB: LED stuck at ".5" (prime node)

Possible causes	Recovery action
Ctrl-B or BREAK key was pressed, or terminal was powered up during startup sequence.	Reset or power up node again.
Enhanced MMP40 (or MMP40) card may be faulty.	Record messages on screen. Replace Enhanced MMP40 (or MMP40) card.

CC: LED stuck at ".5" (non-prime node)

Possible Causes	Recovery Action
Ctrl-B or BREAK key was pressed, or terminal was powered up during startup sequence.	Reset or power up node again.
No bus clocks.	Check that the utility card is installed.
Prime node powered off or prime node CPU absent.	Install/power-up prime node.
Enhanced MMP40 (or MMP40) card may be faulty.	Record messages on screen. Replace Enhanced MMP40 (or MMP40) card.

DD: LED stuck at ".6", ".8", or ".9" (non-prime node)

Possible Causes	Recovery Action
Prime node Enhanced MMP40 (or MMP40) may be faulty.	Record LED state and any SEERs. Replace prime node Enhanced MMP40 (or MMP40).
Enhanced MMP40 (or MMP40) card on non-prime node may be faulty.	Record LED state and any SEERs. Replace non-prime node Enhanced MMP40 (or MMP40).
Utility card may be faulty.	Replace faulty card.

Index

Numerics

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---

1. What is your level of experience with this product?

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    ☐ Learning   ☐ Procedural   ☐ Reference   ☐ Problem solving

3. Did this book meet your needs?

    ☐ Yes   ☐ No

    If you answered No to this question, please answer the following questions.

4. What chapters, sections, or procedures did you find hard to understand?

    _____

    _____

5. What information (if any) was missing from this book?

    _____

    _____

6. How could we improve this book?

    _____

    _____

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