Meridian Mail Modular Option EC

Installation and Maintenance Guide

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Publication history

August 1995

This manual was released as Standard 1.0. This manual documents installation and maintenance procedures for Meridian Mail Product release on the Modular Option EC hardware platform. This release makes all earlier editions obsolete.

April 1995

This manual was released as Standard 1.0. This version documents installation and maintenance procedures for the Release 9.5 Meridian Mail Modular Option EC hardware platform.

This manual consolidates and replaces the March 1994 Standard 1.0 version of the Installation Guide (NTP 555-7061-210) and Maintenance Procedures (NTP 555-7061-500) for the Modular Option EC, Release 9.0.

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About this document

This document describes installation and maintenance procedures to be followed by the technician who installs Meridian Mail or the individual responsible for Meridian Mail system administration and maintenance.

It is assumed that you have a functioning Meridian 1/SL-1 switch and

- do not have Meridian Mail
- have Meridian Mail and are adding one or more nodes
- are troubleshooting a problem with a Meridian Mail system

The “Installation” section of this guide describes the following procedures:

- how to install and configure a Meridian Mail system
- how to connect cables between the switch and Meridian Mail
- how to program the switch to communicate with Meridian Mail

It also shows you how to expand a Meridian Mail system, how to program the switch to recognize the newly added loops and/or ports, and how to communicate command and status information to Meridian Mail.

The “Troubleshooting startup problems” chapter provides tables for fast identification of a problem and procedures for problem correction.

The “Hardware maintenance” chapter describes how to repair or replace a faulty hardware part. Only parts that can be replaced in the field are covered in this document. The parts include the following:

- Printed circuit packs (PCP)
- Module power supplies

- Hard disk subsystems
- Cartridge tape units

The following parts are repaired in the factory and are not covered in this manual:

- Meridian Mail backplane assembly
- Cable harnesses

Administration Guide references

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* (for single-customer systems)
  NTP 555-7001-301
- *System Administration Guide for Multi-Customer System*s
  NTP 555-7001-302
- *Customer Administration Guide for Multi-Customer System*s
  NTP 555-7001-303

Chapter 1: Introduction to Meridian Mail Modular Option EC

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

> ***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.

If you are already familiar with another Meridian Mail platform, for example, Meridian Mail Modular Option, or a previous release of the Meridian Mail software, you may want to read Appendix C of this document for a summary of the enhancements made to Meridian Mail Modular Option EC Release 10.0.

Supported system configuration

For Modular Option EC, an MMP40 card must be installed in every node on the system (primary node and voice nodes). The 68K CPU card is no longer supported.

Platform migration and release conversion

If this is not a new installation (you are migrating from an existing Meridian Mail system), then any hardware installation or modification will have to 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, platform migration, and hardware modification. When necessary, the *System Installation and Modification Guide* will refer back to this manual for hardware installation information.

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 platform migration and release conversion.

Converting from an existing Modular Option EC system

If you are converting from an existing Modular Option EC 68K or MMP40 system to Release 10.0, no platform migration is required.

Conversion to Release 10.0 will require replacement of the CPU card. If you decide to convert your system to 9600 baud, you will also need to replace existing modems with the newer high-speed modems.

> ***Note:*** The UDS V3225 modem has been discontinued by the manufacturer.

New Tandberg tape drives are available (but not mandatory) for Release 10.0, and 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 15 in this manual for replacement instructions.

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 10.0. When the *System Installation and Modification Guide* instructs you to “install the new hardware,” refer to Chapter 15 in this manual for instructions.

> ***Note 1:*** You cannot revert to an earlier version of the Modular Option EC system once you have converted the system to Release 10.0.

Node expansion on an existing system

To perform a node expansion (adding nodes to an existing system), you need to use the system installation and modification program on the Install/data tape. The “Hardware modification” 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* will refer back to this manual for hardware installation information.

Before beginning the system installation and modification procedures, unpack and inspect the new hardware as described in Chapter 4. When the *System Installation and Modification Guide* instructs you to install the new hardware, refer to Chapter 14 in this manual for a complete list of the hardware installation tasks required for a node expansion.

Software

The Meridian Mail Modular Option EC 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 required to set up or modify large groups of users to a minimum.

Hardware

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

Modular Option EC has several hardware features which 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, allowing 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 400 hours of message storage space using 1.0-Gbyte disk drives
- up to four available RS232 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

The system can be configured with up to five nodes. (A node is a functionally independent unit with its own CPU card.) Each node is interconnected to the other nodes in the module by the module backplane. Nodes located in separate modules are connected by an external voice bus (EVB) cable.

The Meridian Mail system can be shadowed or unshadowed resulting in the following possible configurations:

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

Every node is equipped with

- one or two (if you choose the disk shadowing option) hard drives
- one CPU card (MMP40 card with 16-Mbyte RAM)
- one or more voice processors (VP) with either four or eight ports (except for node 1 of a 2- 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)

MMP40 card

The MMP40 card has the following capabilities:

- 16-Mbyte RAM
- 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 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 EC 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 (ESD)I 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 metres (50 and 4000 feet) from the Meridian 1, the administration terminal, a MAT (multiple administration terminal), or GAC (guest administration console)

- Modems for communications if the Meridian Mail module is more than 1219.2 metres (4000 feet) from the Meridian 1, the administration terminal, a MAT or GAC. A central office (CO) or direct-indial (DID) trunk is required for modem connection.

Chapter 2: Preparing for installation

Ensure that the site meets the requirements listed in the *Site and Installation Planning Guide* (NTP 555-7061-200).

Tools required

Tools required for the installation are listed in Table 2-1.

Table 2-1
Tools required for installation

Tool	Description
Anti-static wrist strap	
BIX connector tool	NT product number GYBIX16
Carpenter's level	
Extraction tool	P0741489
Hammer	
Phillips screwdriver	small, medium
Slotted screwdriver	small, large
Socket wrenches	6.35-, 7.94-, and 14.29-mm (1/4-, 5/16-, and 9/16-inch)
Volt meter	
Wire cutters	
Wire strippers	

Reference documents

Installation procedures for some of the components of this system require additional documentation. For example, installation of the universal equipment modules asks you to refer to the Meridian 1 Installation procedures.

Documents referenced for installation procedures in this manual are listed in Table 2-2.

Table 2-2
Referenced documents and NTP numbers

Reference 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 *Meridian Mail System Administration Guide for Multi-Customer Systems*	555-7001-301 555-7001-302
System Administration Tools	555-7001-305
System Administration—AdminPlus	555-7001-310
Meridian Mail Maintenance Messages (SEERS) Guide	555-7001-510
Meridian Mail Modular Option EC Site and Installation Planning Guide	555-7061-200
Note: The SL-1 switch documents referenced above apply to the Meridian 1 switch since for all intents and purposes the switches are the same.	

Chapter 3: Assembly overview

This chapter summarizes the steps required to install a Meridian Mail Modular Option EC. If you are expanding an existing system by adding nodes, see Chapter 14, “Adding a node.”

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

The system is housed in universal equipment modules (UEMs). To install the modules, you will need the appropriate Meridian 1 documentation as indicated in Chapter 2.

Before starting the installation, make sure the site meets the requirements listed in the *Site and Installation Planning Guide* (NTP 555-7061-200).

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

Note: System installation is to be performed by qualified personnel only.

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

Table 3–1

Installation task list

To	See Chapter
Unpack and inspect the equipment.	4
If necessary, install Meridian Mail columns, including power and grounding, and earthquake protection. Install Meridian Mail modules.	5
Install power supplies.	6
Install disk drives and the tape drive.	7
Configure the backplane and install printed circuit packs.	8
Install intra- and intermodule cables.	9
Cable, install, and configure peripheral devices.	10
Install the Meridian Mail to PBX interface.	11
Configure the Meridian 1.	12
Start up, configure, and acceptance test Meridian Mail.	13

Chapter 4: Unpacking and inspecting the equipment

This procedure gives the steps required to unpack and inspect the Modular Option EC equipment to make sure all the components are present and the equipment is placed in an appropriate location.

CAUTION
Risk of equipment damage
Wear an anti-static wrist strap when handling components. As an additional safety measure, handle components by the edges and, whenever possible, with the loosened packing material still around the component.

Procedure 4-1
Unpacking and inspecting the equipment

1. If the equipment is mounted on a shipping pallet, follow the unpacking instructions provided with the packaging material and remove the equipment from the pallet.
2. Cut any remaining strapping or tape.
3. Remove the transport protection devices and loosen any stretch-wrap film (if provided) from equipment.

   The stretch-wrap film can be removed at your own discretion. However, 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 Check all items delivered against the order form and the packing slip. Report any errors or omissions to your supplier.

See “Appendix A” in the *Site and Installation Planning Guide* (NTP 555-7061-200) for a list of part numbers.

5 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 to the components.

Components that are usually shipped in separate boxes include documentation, disk and tape units, power supply, cables, administration terminals, printer, and spares.

6 Place the equipment, unpacked, in a safe, dry location in the equipment room close to its final location.

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

8 Remove the preinstalled printed circuit packs (PCPs) from the shelf, following Procedure 4-2, and check for any loose parts, broken edges, and any other obvious damage to the component.

9 Inspect the remaining equipment for the following:

— damaged connectors or connectors containing foreign material

— defects in the molded plastic covers

— any loose items remaining in the shipping cartons

— any obvious damage to the equipment

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

Report any damage or defects to the supplier.

Procedure 4-2
Removing and reinstalling PCPs

1 Open the ejectors on the card and gently pull the card towards you until it clears the shelf. (See Figure 4-1).

Note: There is a pin on the card that the ejectors latch on to. If the ejectors will not open, pinch them to raise them up and off the pin.

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

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

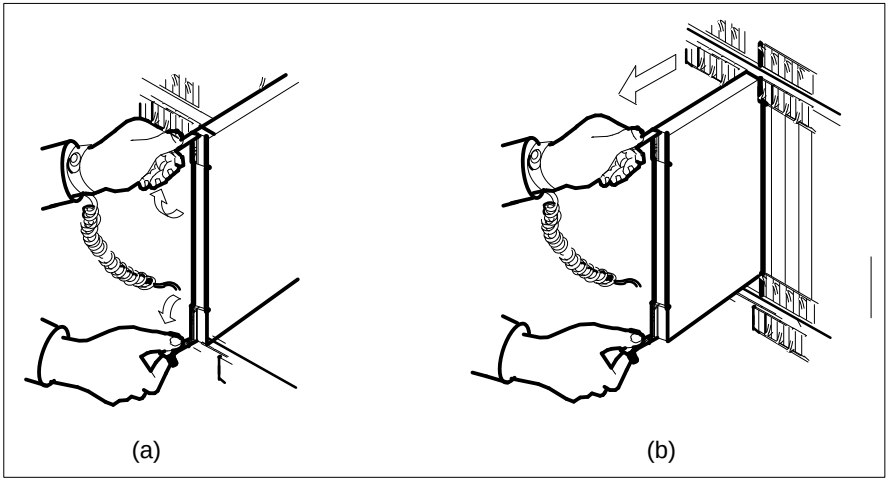
4 Reseat the card in the module by aligning it with the slots in the module with the ejectors still in the open position, and then gently sliding the card back into the module.

5 Seat and lock the card as follows:

   a. Push the upper and lower edges of the faceplate to ensure that the card is fully seated in the module

   b. Close the ejectors

Figure 4-1
PCP removal



Chapter 5: Installing a column or module

The procedure for installing an equipment column or module for Meridian Mail is identical to the procedure for installing a Meridian 1 column or module. Since the relevant documents were supplied with your switch, the information is not repeated here. Instead, references are given to the SL-1 documents in which the information can be found.

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

Table 5-1
Installing a column

Procedure	Reference document	Chapter and Section
Install Meridian Mail columns	*SL-1 System Installation Procedures* (NTP 553-3001-210)	Chapter “Introduction”, section “Equipment handling precautions” except for the part on “Data disks”
Install earthquake protection, if needed	*SL-1 System Installation Procedures* (NTP 553-3001-210)	Chapter “Installing Earthquake Bracing”
Position and level the equipment	*SL-1 System Installation Procedures* (NTP 553-3001-210)	Chapter “Positioning and Leveling Equipment”
Install AC grounding and power (AC-powered systems)	*SL-1 System Installation Procedures* (NTP 553-3001-210) NT6D82 Power System; Description, installation, and maintenance (NTP 553-3001-110)	Chapter “Installing AC power”

–continued–

Table 5-1
Installing a column (continued)

Procedure	Reference document	Chapter and Section
Install DC grounding and power (DC-powered systems)	*SL-1 System Installation Procedures* (NTP 553-3001-210) NT6D82 Power System; Description, installation, and maintenance (NTP 553-3001-110)	Chapter “Installing DC power”
–end–		

Table 5-2
Installing a module

Procedure	Reference document	Chapter and Section
Install Meridian Mail modules	*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. Overlay 37 commands are typed 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 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 supply.

If you are installing a module in an AC system, leave the shelf breakers off.

Module doors and I/O cover

To install power supplies, disk drives, and tape drives, and to check the printed circuit packs, you need the front door of the module to be open. To verify or change backplane switch settings and verify, remove, or fit EVB terminators and address jumper boards, you need the rear door of the module to be open and the I/O cover to be off. To install cables, you need the rear door of the module to be open and may need the I/O cover to be off.

For this reason, you should leave the module doors open after installing the module.

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

Module identification

Modules are identified by a label at the right side of the front of the case. They are numbered Module 0, 1, and 2. In this manual, the modules are referred to as MM0, MM1, and MM2.

If you are expanding an existing system and are adding a new module, the new module is shipped with labels that allow you to label the new module. Label the new module as follows:

- The module containing Meridian Mail node 1 is module MM0.
- The other module in any 2-module system is module MM1.
- In a 5-node shadowed system, the other module that contains two nodes (besides module MM0) is module MM1.
- The last module in a 5-node shadowed system is module MM2.

This Meridian Mail module numbering applies regardless of the placement of modules within a column.

Chapter 6: Installing power supplies

Common equipment power supply (CEPS or DCEPS) installation

This chapter gives the steps required to install the power supplies in each module of either an AC (CEPS) or a DC (DCEPS) system.

References to modules MM0, MM1, and MM2 are to be understood as follows:

- The module containing Meridian Mail node 1 is module MM0.
- The other module in any two-module system is module MM1.
- In a 5-node shadowed system, the other module that contains two nodes (besides module MM0) is module MM1.
- The last module in a 5-node shadowed system is module MM2.

This Meridian Mail module numbering applies regardless of the placement of modules within a column.

Location of power supplies

Use Table 6-1 to determine the proper location for each power supply, then follow the steps in Procedure 6-1 for an AC system, or Procedure 6-2 for a DC system, for each module in the system.

Table 6-1
Location of power supplies

Number of nodes (unshadowed)	Number of nodes (shadowed)	Location of power supplies
1	1	Left CEPS slot in module MM0
2 or 3	2	Left and right CEPS slots in module MM0
4	3	Left and right CEPS slots in module MM0 Left CEPS slot in module MM1
5	4	Left and right CEPS slots in module MM0 Left and right CEPS slots in module MM1
N/A	5	Left and right CEPS slots in module MM0 Left and right CEPS slots in module MM1 Left CEPS slot in module MM2
Note: Do not install power supplies in locations not identified above.		

AC system

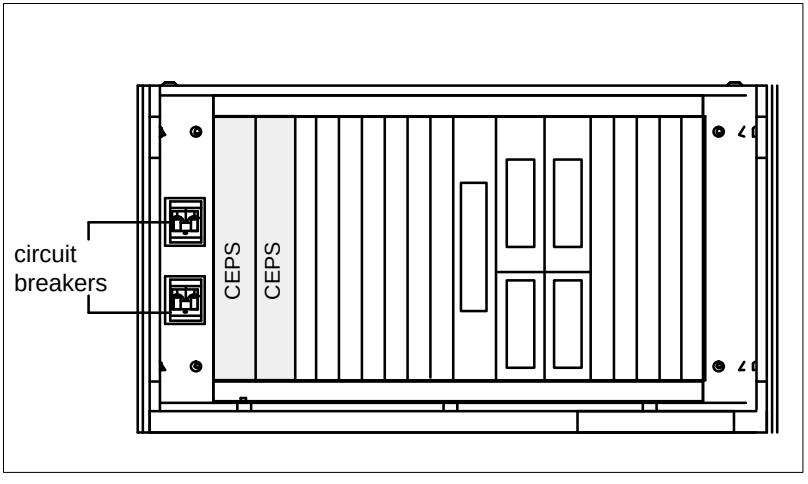
DANGER
Risk of electrocution
Do not remove the power supply unless the shelf breakers are off and the power is disconnected. Wait five minutes after the power has been turned off before removing the power supply.

Procedure 6-1
Installing the CEPS for an AC system

1. Verify that the power to the Meridian Mail module is off. Use the circuit breakers shown in Figure 6-1.
2. Open the ejectors and align the power supply with the appropriate CEPS slot in the module. Refer to Figure 6-1.
3. Gently slide the power supply into the module, pushing on the upper and lower edges to ensure that 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 up.
   a. If they do, turn the power off again.

b. If they do not, follow the procedures in the chapter "Troubleshooting startup problems" later in this guide.

Figure 6-1
Location of CEPS on an AC system



DC system

DANGER
Risk of electrocution
Do not remove the power supply unless the DCEPS switch is off and the power is disconnected. Wait five minutes after the power has been turned off before removing the power supply.

Procedure 6-2
Installing the DCEPS for a DC system

1 Verify that the switches on the DCEPS are off.

2 Open the ejectors and align the power supply with the appropriate DCEPS slot in the module. Refer to Figure 6-2.

3 Gently slide the power supply into the module, pushing on the upper and lower edges to ensure that it is fully seated in the module.

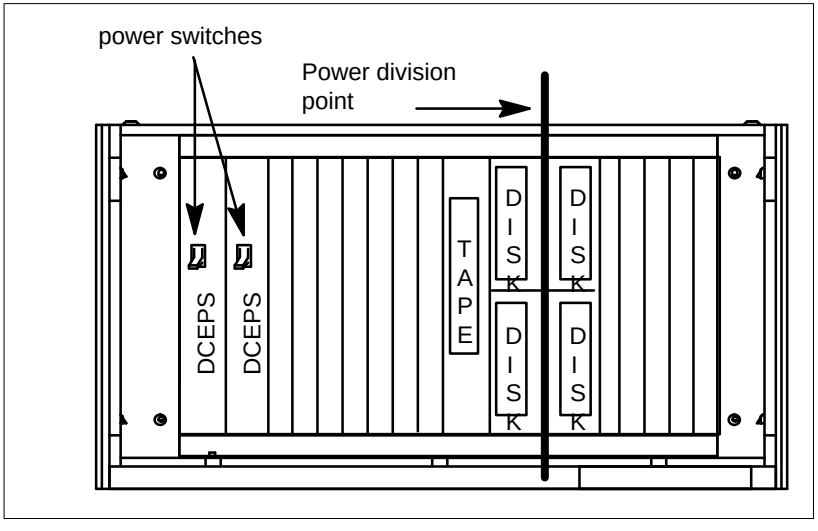
4 Close the ejectors.

5 Briefly turn on the switches on the DCEPS and verify that the LED at the top of each DCEPS lights up.

a. If they do, turn the power off again.

b. If they do not, follow the procedures in Chapter 16 “Troubleshooting startup problems”.

Figure 6-2
Location of DCEPS on a DC system



Chapter 7: Installing the disk and tape drives

This chapter tells you how to install disk and tape drives. You will need to install drives in each module of the system.

Overview of disk drives

Your system comes with one disk drive for each unshadowed node and two drives for each shadowed node. Each drive is labeled for the node it belongs to, and is mounted on a disk drive carrier which also holds the connector to the backplane. Disks that reside in the top disk drive MSU slots (MSU3 and MSU5) contain an auxiliary power pack. This includes the secondary disk in a shadowed node and the disk in node 3 of an unshadowed 3-, 4-, or 5-node system.

The system supports 300-Mbyte and 1.0-Gbyte disk drives. The disk drives, manufacturer model number, and Northern Telecom Product Engineering Codes (PEC) are shown in Table 7-1.

You must verify jumper settings before installing drives. Disk drive jumper settings are shown in Figures 7-3 to 7-9.

> ***Note:*** Diagrams of the disk drives are for reference only. They are not drawn to scale and do not include details of the disks that are not relevant to the procedure described.

Table 7-1
Modular Option EC disk drives

Assembly number / Common product code	Title of assembly	Models	Individual disk drive CPC
NT6P06AA (A0391975)	300 Mbyte hard disk unit	Maxtor LXT340SY	A0351371
		Seagate ST1480N	–
		Seagate ST3390N	A0602257
NT6P07AA (A0391976)	1.0 Gbyte hard disk unit	Maxtor MXT1240	–
		Seagate ST11200	
		Seagate ST31230N	A0616792
		DEC DSP3105/3107	–
NT6P44AA (A0394781)	1.0 Gbyte disk with auxiliary power	Maxtor/Seagate disk drive with power unit	–
		DEC DSP3105/3107	A0383809
		Maxtor MXT1240S	
		Seagate ST11200	
		Seagate ST31230N	A0616792

Disk drives in an unshadowed system

Slot locations

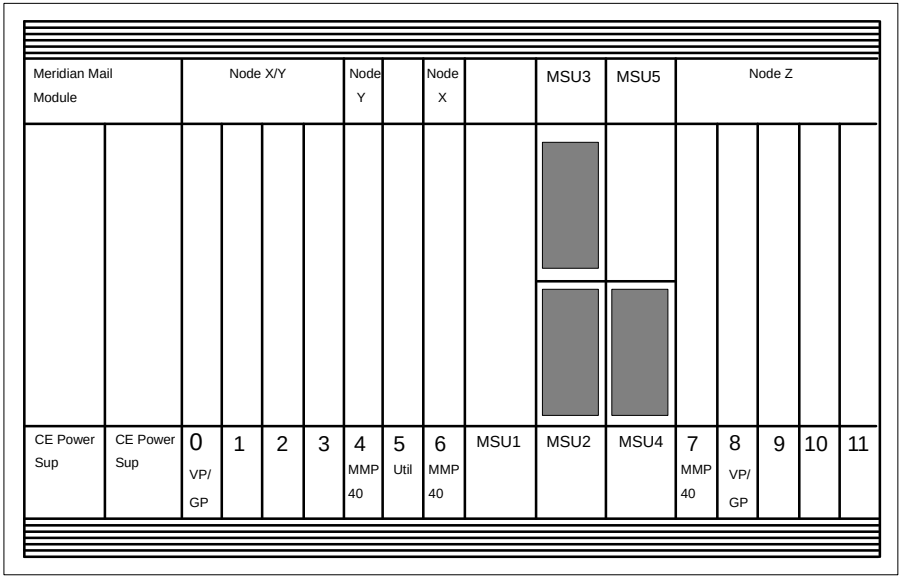
Table 7-2 and Figure 7-1 show the slot locations of the disk drives in an unshadowed system.

Table 7-2
Location of disk drives for each node in an unshadowed system

Node	Module	MSU Slot
Node 1	Module 0	MSU2
Node 2	Module 0	MSU4
Node 3	Module 0	MSU3 (with power pack)
Node 4	Module 1	MSU2
Node 5	Module 1	MSU4

Note: The disk units are labeled to show the node number for which they are configured. Be sure to check the number and install the disk in the correct node. The disk drive with power pack goes in slot MSU3 in module MM0.

Figure 7-1
Location of disk drives in an unshadowed system



Disk installation (unshadowed systems)

DANGER
Risk of electrical shock
Ensure that power to the module you are working on is off before you install or remove disk drives.

CAUTION
Risk of equipment damage
Use extreme care and wear a grounding strap when installing the disk drives. They are susceptible to electrostatic damage and damage from rough or improper handling.

The installation of disks in an unshadowed system involves the following two procedures:

1 setting the SCSI ID of the disk (see Procedure 7-1)

2 the actual installation of the disk (see Procedure 7-2)

Procedure 7-1
Setting the SCSI ID for an unshadowed disk

1 Refer to Table 7-3 to find the appropriate header locations for the disk drive.

Table 7-3
Location of headers for SCSI settings

Disk drive model	Header	See
Maxtor LXT340SY	not applicable	Figure 7-3
Seagate ST1480N	J5 (2-by-3)	Figure 7-4
Seagate ST3390N	J5 (2-by-3)	Figure 7-5
Seagate ST11200	J5 (2-by-3)	Figure 7-6
Maxtor MXT1240	J6 (2-by-6)	Figure 7-7
DEC DSP3107L	J3 (2-by-10)	Figure 7-8
Seagate ST31230N	J5 (2-by-3)	Figure 7-9

2 Set the SCSI ID of the disk to 0 by removing any jumpers on the header. See Figures 7-3 to 7-9 for the locations of the jumpers.

Procedure 7-2
Installing disks in an unshadowed system

1 Power off the module.

2 If the faceplate that covers the disk drive/tape drive area is in place, loosen the screw holding it and slide the faceplate up and out.

3 Lay the disk drive on a flaf stable surface, with the disk drive carrier facing up. (See page 7-10 for description).

If the disk drive contains separators, ensure that they are all present. Separators are little plastic disks that fit over the screw holes and protect the disk drive from damage caused by vibration.

4 Unpack each disk drive and ensure that it has the same part number, including suffix, as the one on your packing slip.

5 Ensure that the SCSI ID on the drive is set to 0 by following Procedure 7-1, “Setting the SCSI ID for an unshadowed disk.”

6 Ensure that all terminators are removed from the disk. Refer to Figures 7-3 through 7-9 for terminator locations for each type of disk drive.

7 Ensure that all other settings (for example, parity and motor start) are correctly set. Refer to Figures 7-3 through 7-9 for disk drive settings.

8 Replace the disk drive carrier if it was removed.

9 Open the ejectors and align the disk drive carrier with the appropriate MSU slot in the module. (Refer to Figure 7-1 and Table 7-2 for disk slot locations within the module).

10 Gently slide the card into the module, pushing on the upper and lower edges to ensure that the disk drive is fully seated in the module.

11 Close the ejectors.

12 Replace the faceplate.

Ensure that all separators are present.

Disk drives in a shadowed system

Slot locations

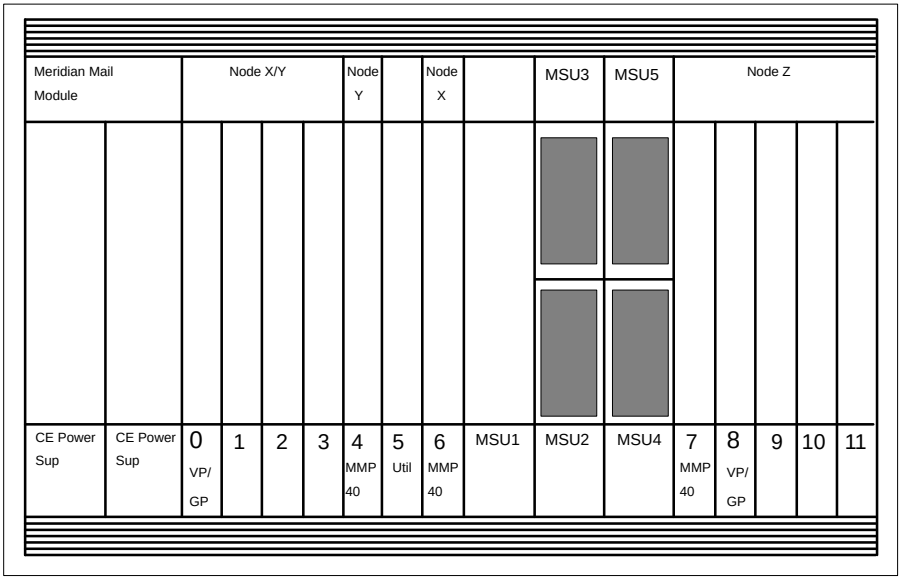
Table 7-4 and Figure 7-2 show the slot locations of the disk drives in a shadowed system.

Table 7-4
Location of disk drives for each node in a shadowed system

Node	Module	MSU slot (primary disk)	MSU slot (secondary disk with power pack)
Node 1	Module 0	MSU2	MSU3
Node 2	Module 0	MSU4	MSU5
Node 3	Module 1	MSU2	MSU3
Node 4	Module 1	MSU4	MSU5
Node 5	Module 2	MSU2	MSU3

Note: The disk units are labeled to show the node number for which they are configured. Be sure to check the number and install the disk into the correct node. Secondary disk drives (with power packs) go in the upper MSU slots (MSU3 and MSU5) in their respective nodes.

Figure 7-2
Location of disk drives in a shadowed system



Disk installation (shadowed systems)

DANGER
Risk of electrical shock
Ensure that power to the module you are working on is off before you install or remove disk drives.

CAUTION
Risk of equipment damage
Use extreme care and wear a grounding strap when installing the disk drives. They are susceptible to electrostatic damage and damage from rough or improper handling.

The installation of disks in an unshadowed system involves the following two procedures:

1 setting the SCSI ID of the primary disk (see Procedure 7-3)

2 setting the SCSI ID of the secondary disk (see Procedure 7-4)

3 the actual installation of the disk (see Procedure 7-5)

Procedure 7-3
Setting the SCSI ID for a primary disk

1 Refer to Table 7-5 to determine the appropriate header location for the primary disk drive.

Note: To set the termination header, the disk drive carrier must be removed. To remove the disk drive carrier see Step 2 in Procedure 7-5.

Table 7-5
Location of headers for primary disk SCSI settings

Disk drive model	Header	See
Maxtor LXT340SY	not applicable	Figure 7-3
Seagate ST1480N	J5 (2-by-3)	Figure 7-4
Seagate ST3390N	J5 (2-by-3)	Figure 7-5
Seagate ST11200	J5 (2-by-3)	Figure 7-6
Maxtor MXT1240	J6 (2-by-6)	Figure 7-7
DEC DSP3107L	J3 (2-by-10)	Figure 7-8
Seagate ST31230N	J5 (2-by-3)	Figure 7-9

2 Set the SCSI ID of the primary disk to 0 by removing any jumpers on the header. See Figures 7-3 to 7-9 for the locations of the jumpers.

Removing these jumpers sets the SCSI ID of the disk to 0.

Procedure 7-4
Setting the SCSI ID for a secondary disk

1 Refer to Table 7-5 to determine the appropriate header location for the secondary disk drive.

Note: To set the termination header, the disk drive carrier must be removed. To remove the disk drive carrier see Step 2 in Procedure 7-5.

2 Set the SCSI ID of the secondary disk to 2 by removing any jumpers, or inserting a jumper, on the header. See Figures 7-3 to 7-9 for the locations of jumpers settings for the secondary disk.

Procedure 7-5
Installing disks in a shadowed system

1 Power off the module.

2 If the faceplate that covers the disk drive/tape drive area is in place, loosen the screw holding it and slide the faceplate up and out.

3 Lay the disk drive on a flaf stable surface, with the disk drive carrier facing up. (See page 7-10 for description).

If the disk drive contains separators, ensure that they are all present. Separators are little plastic disks that fit over the screw holes and protect the disk drive from damage caused by vibration.

4 Unpack each disk drive and ensure that it has the same part number, including suffix, as the one on your packing slip.

5 Ensure that the SCSI ID on each primary drive (without power pack) is set to 0 by following the steps outlined in Procedure 7-3, “Setting the SCSI ID for a primary disk.”

6 Ensure that the SCSI ID on each secondary drive (with power pack) is set to 2 by following the steps outlined in Procedure 7-4, “Setting the SCSI ID for a secondary disk.”

7 Ensure that all terminators are removed from each disk. Refer to Figures 7-3 to 7-9 for terminator locations for each type of disk drive.

8 Ensure that all other settings (for example, parity and motor start) are correctly set. Refer to Figures 7-3 through 7-9 for disk drive settings.

9 Replace the disk drive carrier if it was removed.

10 Open the ejectors and align the disk drive carrier with the appropriate MSU slot in the module (refer to Figure 7-2 and Table 7-4 for disk slot locations within the module).

11 Gently slide the card into the module, pushing on the upper and lower edges to ensure that the disk drive is fully seated in the module.

12 Close the ejectors.

13 Replace the faceplate.

Ensure that all separators are present.

Disk drive diagrams

Disk drives are mounted on a steel disk drive carrier, which also holds the backplane connector and, for drive assemblies with power packs, the power pack. The following diagrams of the disk drives show the view from the disk drive carrier-side, and show the drives as if the carrier were transparent.

You can identify a drive as Seagate, Maxtor, or DEC by comparing the positions of the jumpers on the drive with the diagrams. When you look at the jumper diagrams for Seagate drives, imagine that you are looking at the side or end view of the drive, with the disk drive carrier at the top.

A cutout on the disk drive carrier may allow you to see and change jumper settings for the SCSI ID of a Maxtor drive.

> ***Note:*** Cutouts are not present on (the disk drive plate to accommodate) Seagate and DEC disk drives.

Figure 7-3
300-Mbyte Maxtor LXT340SY disk drive and jumper settings

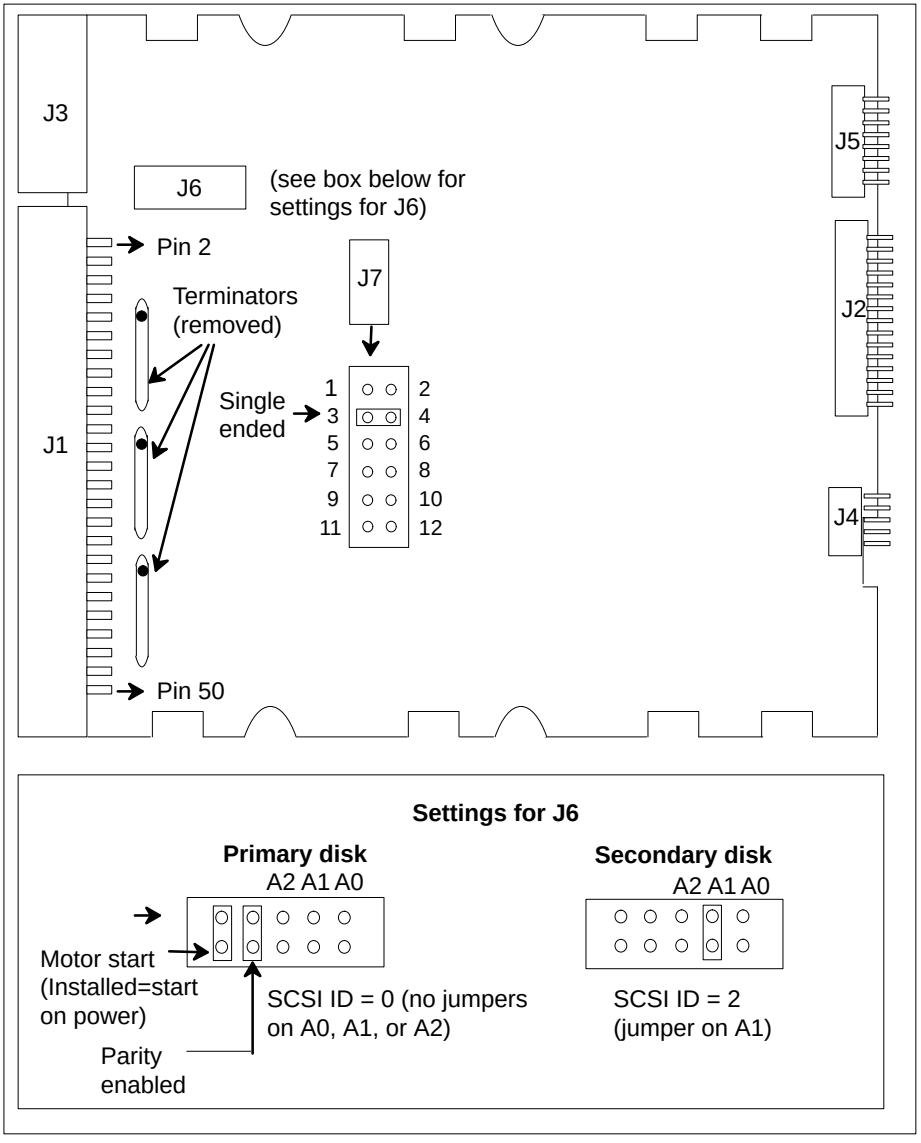


Figure 7-4
300-Mbyte Seagate ST1480N disk drive connectors and jumper settings

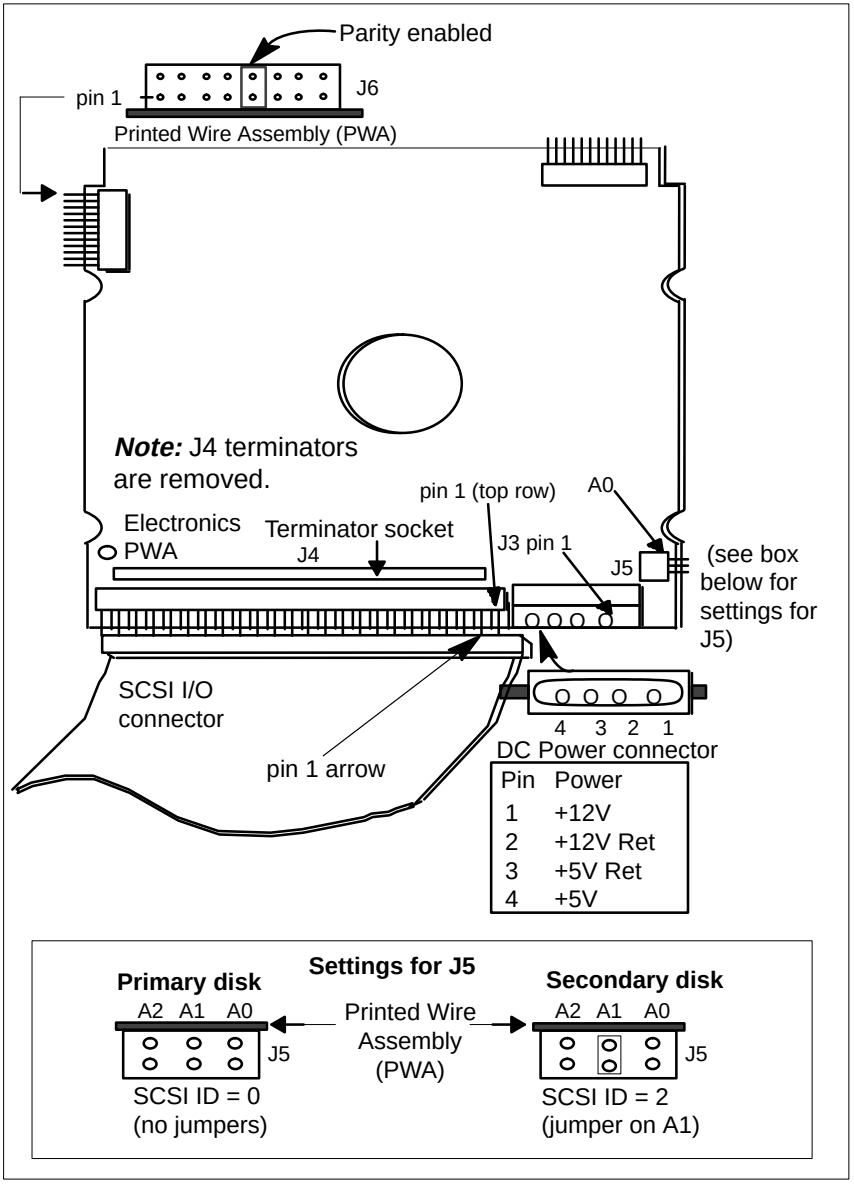


Figure 7-5
300-Mbyte Seagate ST3390N disk drive connectors and jumper settings

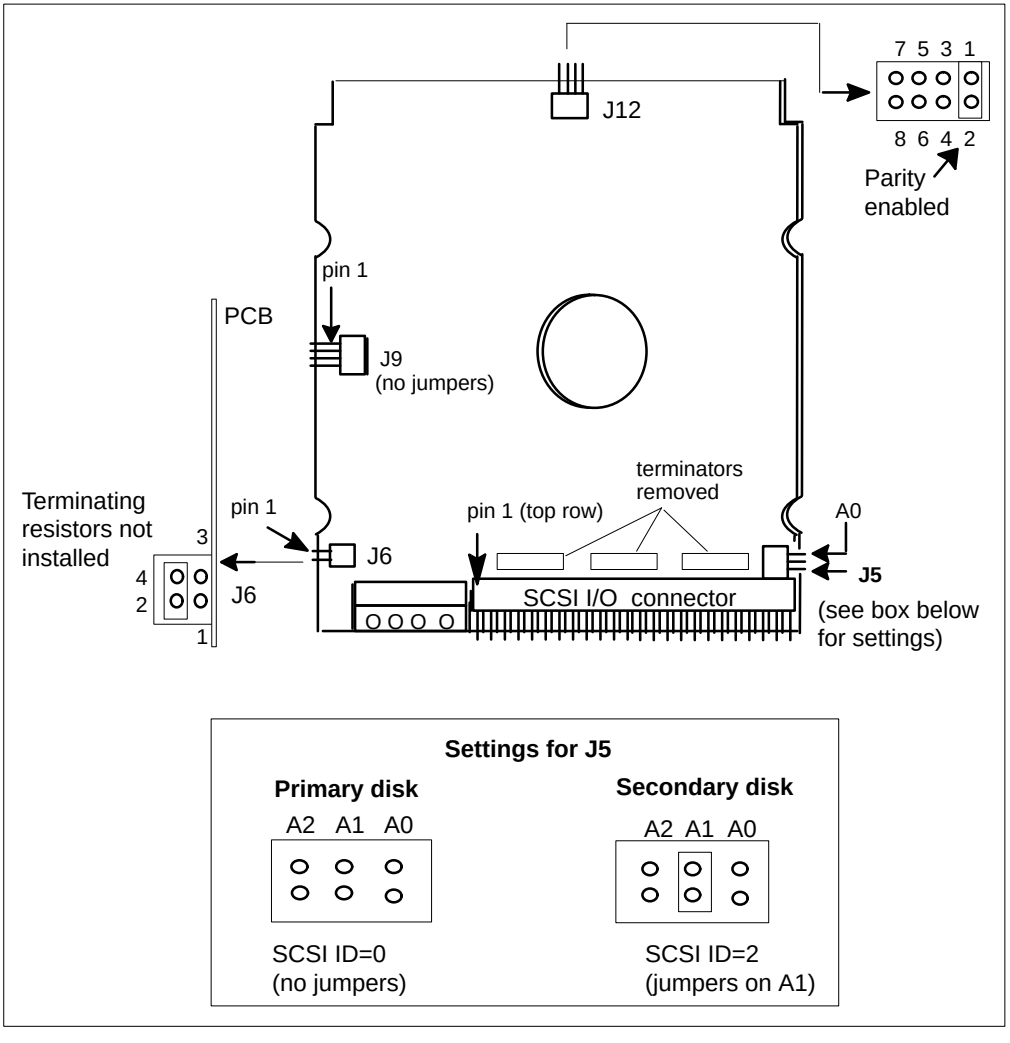
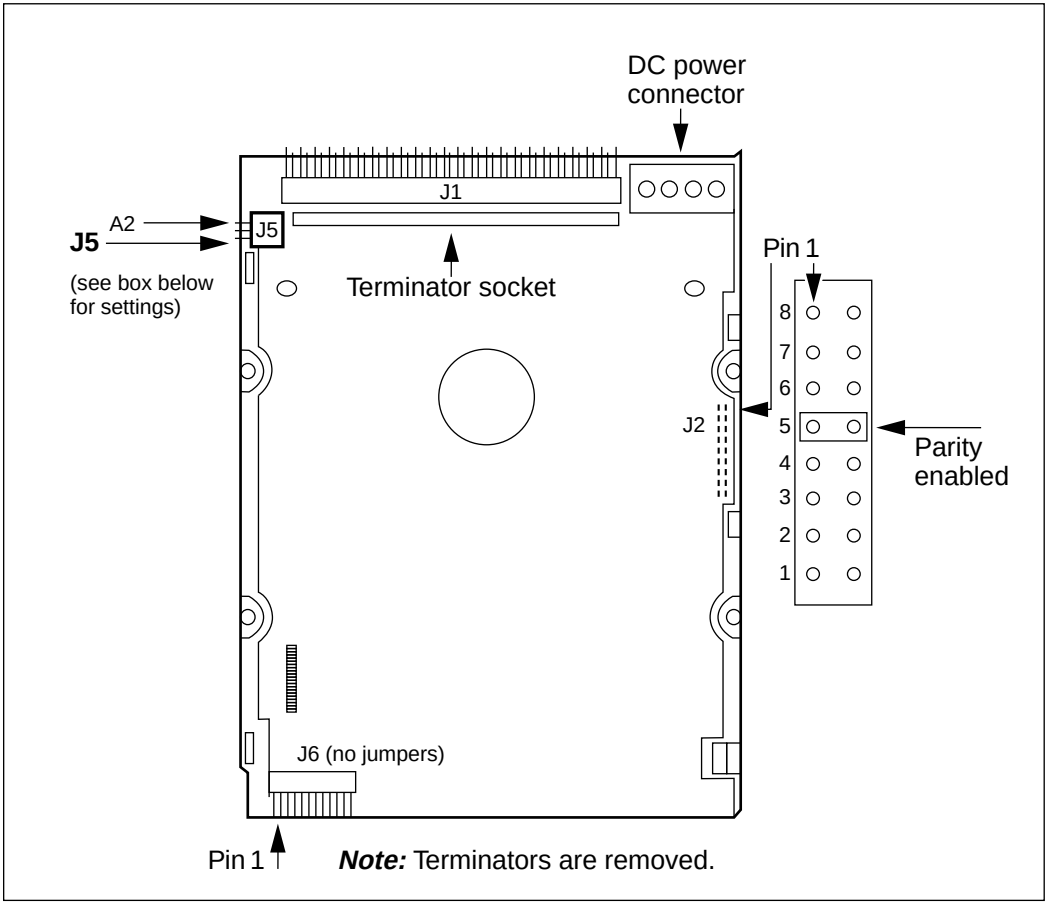
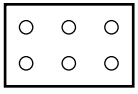


Figure 7-6
1.0-Gbyte Seagate ST11200 disk drive connectors and jumper settings



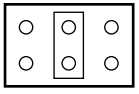
Settings for J5

Primary disk
A2 A1 A0



2-by-3 header
SCSI ID=0
(no jumpers)

Secondary disk
A2 A1 A0



2-by-3 header
SCSI ID=2
(jumper on A1)

Figure 7-7
1.0-Gbyte Maxtor MXT1240 disk drive and jumper settings

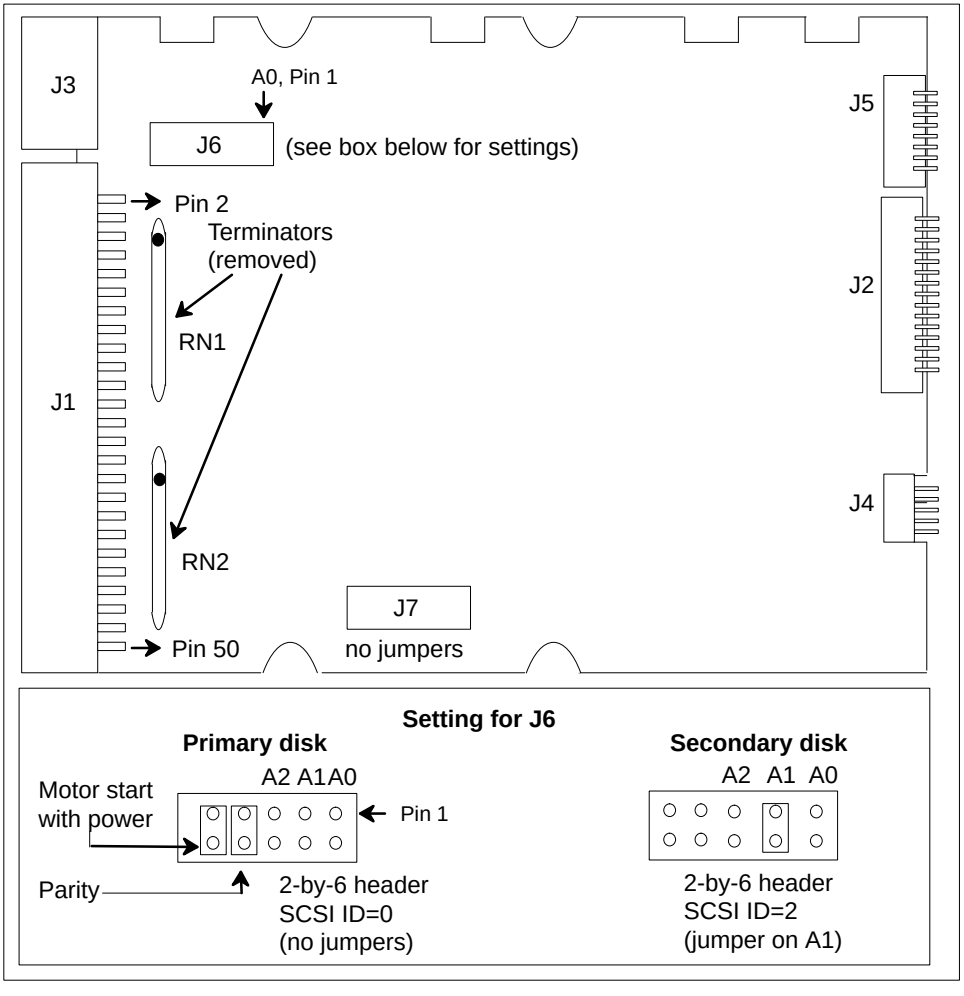


Figure 7-8
1.0-Gbyte DEC DSP3107L disk drive and jumper settings

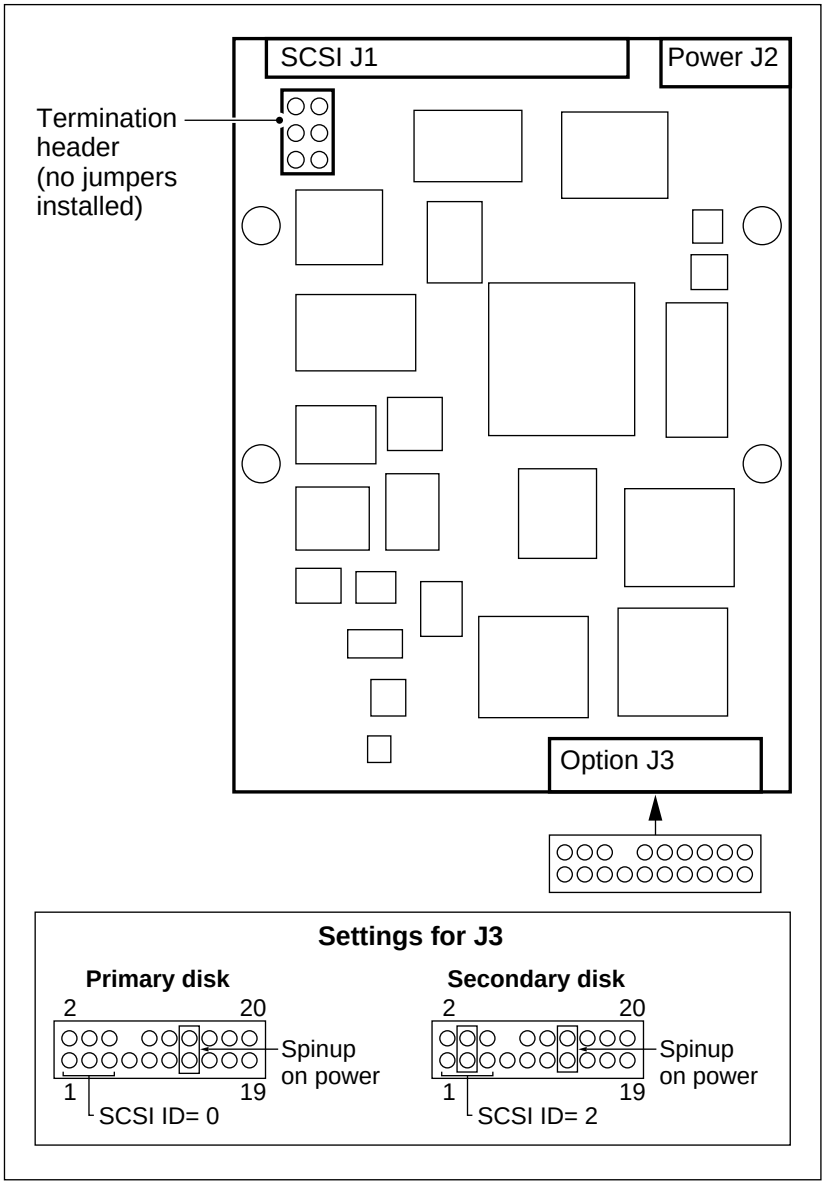
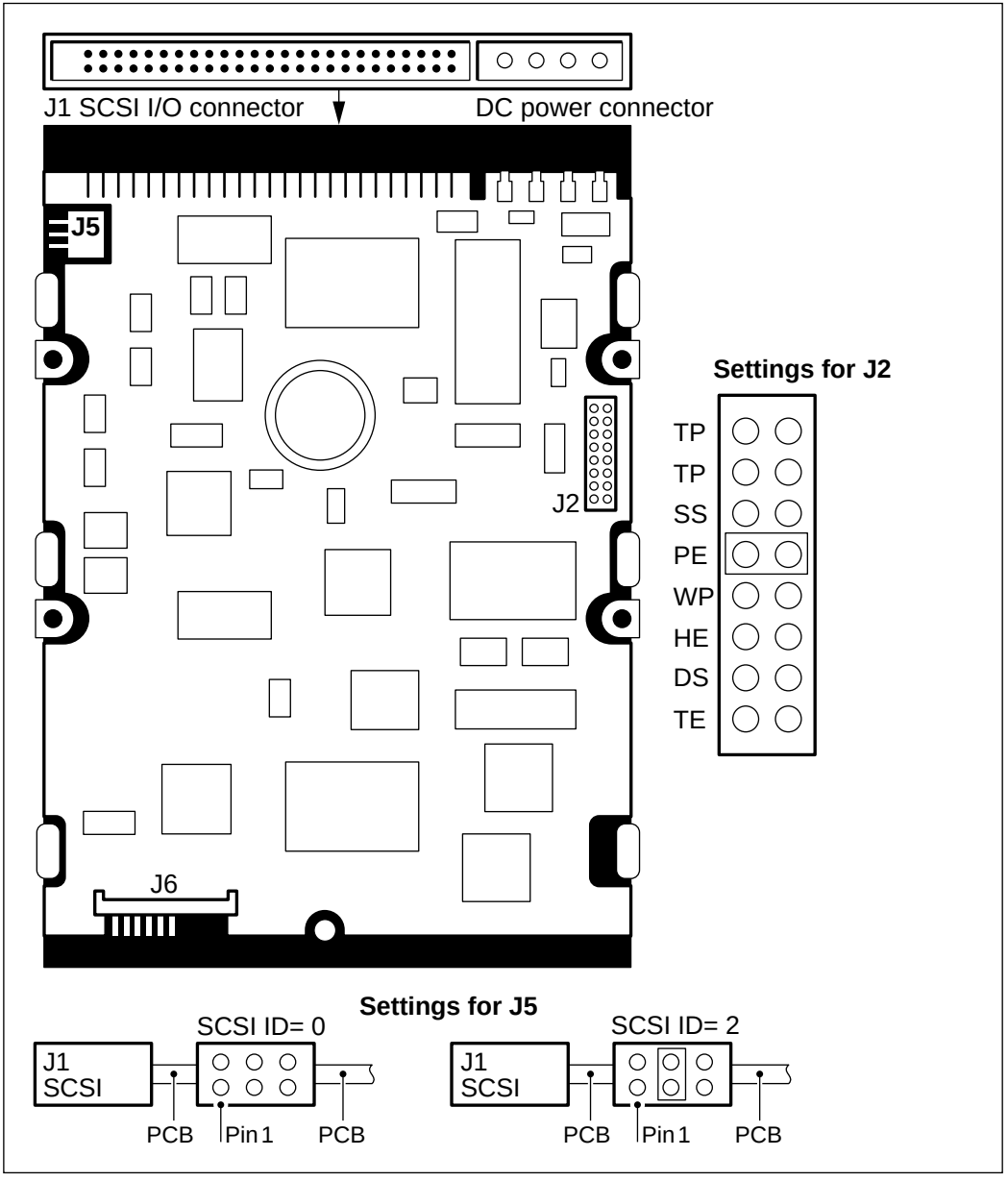


Figure 7-9
1.2- and 2.0 Gbyte Seagate ST31230N disk drive and jumper settings



Overview of tape drives

The system requires a tape drive in order to read information from the Install/data tape cartridge for the installation or upgrading of system software. The tape drive may also be used to back up system and voice data.

Two tape drives are supported for Release 10.0 of the Modular Option EC system, as listed in Table 7-6.

Table 7-6
Supported tape drives

Tape drive	PEC code	Storage capacity
Tandberg TDC 4220	NT6P05BA (A0630014)	2.5 Gbytes
Archive 2150	NT6P05AA (A0391974)	250 Mbytes

Tandberg tape drive

All new Modular Option EC systems will be shipped with the Tandberg TDC4220 tape drive. This tape drive increases the maximum storage capacity from 250 Mbytes to 2.5 Gbytes and doubles the speed of operation. The Tandberg tape drive is compatible with all existing Meridian Mail tapes.

> ***Note:*** An upgrade to the Tandberg drive is not a requirement for conversion from an earlier release of Meridian Mail to Release 10.0, as the existing Archive (Viper) tape drive is fully compatible. If you choose to install the new Tandberg tape drive, refer to Chapter 15, "Converting from an existing Modular Option EC system to Release 10.0," for detailed instructions.

The current status of the drive's operation is shown by an LED indicator light on the front panel of the tape drive. Refer to Table 7-7 for an explanation of each mode.

Inserting and removing tapes

To insert a tape, press the Release button to open the door. (if there is a tape in the drive already, removed it.) Gently push the tape into the drive and close the door. To remove a tape, press the Release button to open the door and remove the tape

Table 7-7
LED indicator on Tandberg tape drive

LED	Status
Off	No cartridge in drive
Green (Steady)	Cartridge inserted
Green (Blinking)	Drive motor is operating
Amber (Steady)	Media or hardware error If a media error, the amber light goes off when the cartridge is removed. If a hardware error, the amber light stays on until the SCSI bus is reset when the system is rebooted.

Archive tape drive

The existing Archive tape drive has a storage capacity of 250 Mbytes. There is an LED on the Archive tape drive to indicate whether the drive is working. To determine if the tape drive is working, it is necessary to listen for the distinctive whirring noise.

Inserting and removing tapes

To insert a tape, gently push the tape into the drive and slide it slightly to the left. When it is in position, slide the latch down into position over the tape drive opening. To remove the tape, simply slide the latch up and the tape will be ejected.

Supported tape formats

The Tandberg and Archive tape drives can read and write on a number of tape formats. as listed in Table 7-8.

> ***Note:*** The amount of data which can be written on a tape depends on the condition of the cartridge. If a cartridge has many media imperfections, it will store less data since blocks have to be rewritten in another area on the tape.

Table 7-8
Supported tape formats

Tape format	Tape media	Tape capacity
QIC-24(R*)	DC300XL	40 Mbyte
QIC-120	DC600	60 Mbyte
QIC-150/QIC-150	DC6150/DC6250	155 Mbyte/250 Mbyte
QIC-525	DC6525	525 Mbyte
QIC-1000	DC9100	1 Gbyte
QIC-2GB/QIC-2GB	Magnus 2.0/Magnus 2.5	2-Gbyte/2.5-Gbyte
R*– read–capability only		

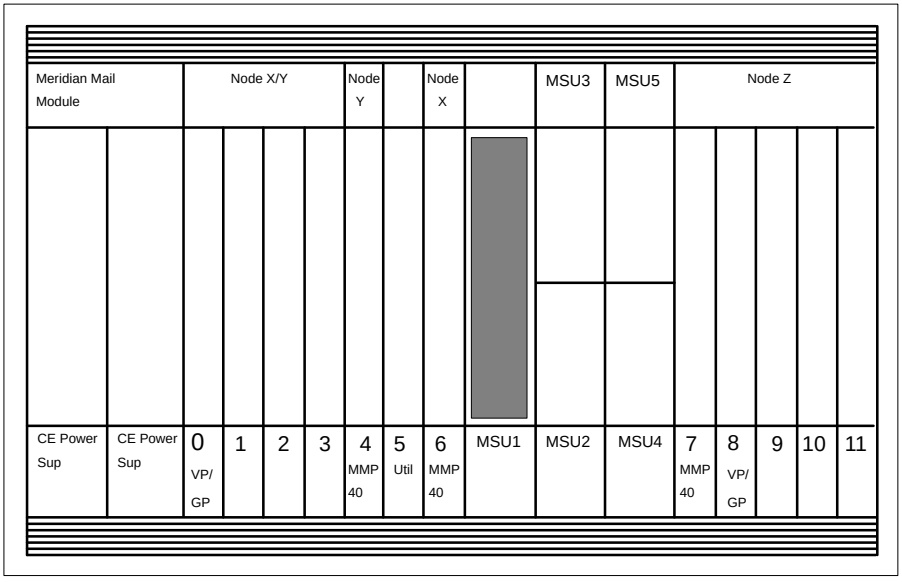
Both the Tandberg and the Archive tape drives can read but not write to the old QIC-24 format tapes. The Archive drive can also read Tandberg backup tapes on 150-or 250-Mbyte cartridges.

WARNING
Risk of data errors
If you are using the DC6250 media. you should not revert back to the DC6150 media as this may cause data errors when reading from the tape.

Tape drive location

Figure 7-10 shows the slot location of the tape drives in a Modular Option EC system. The tape drive is always installed in module MM0 in the slot labeled MSU1 (mass storage unit).

Figure 7-10
Location of tape drive



Tape drive installation

The installation of tape drives involves the following two procedures:

1 setting the SCSI ID of the tape drive (see Procedure 7-6)

2 the actual installation of the tape drive (see Procedure 7-7)

CAUTION
Risk of equipment damage
Use extreme care and wear a grounding strap when installing the tape drive. It is susceptible to electrostatic damage and to damage from rough or improper handling.

DANGER
Risk of electrical shock
Ensure that power to the module you are working on is off before you install or remove the tape drive.

Procedure 7-6
Setting the SCSI ID for the tape drive

1. Find the SCSI ID header. For Archive tape drives, refer to Figures 7-12 and 7-11; and for Tandberg tape drives, refer to Figures 7-14 and 7-13 for the header location.
2. Set the SCSI ID of the tape drive to 1 by removing any jumpers, and inserting a jumper, on the header as indicated in the figures.

   This sets the SCSI ID of the tape drive to 1.
3. Ensure that the tape drive terminator resistor packs are removed as indicated in the figures.
4. Verify the other jumpers. For Archive tape drives, refer to Figures 7-12 and 7-11; and for Tandberg tape drives, refer to Figures 7-14 and 7-13 for jumper information.

Procedure 7-7
Installing the tape drive

1. Power off the module.
2. If the faceplate that covers the disk drive/tape drive area is in place, loosen the screw holding it and slide the faceplate up and out.
3. Unpack the tape drive and ensure that it has the same part number, including suffix, as the one on your packing slip.
4. Ensure that the SCSI ID on the drive is set to 1 by following Procedure 7-6, “Setting the SCSI ID for the tape drive.”
5. Ensure all terminators are removed from the tape drive. For Archive tape drives, refer to Figures 7-12 and 7-11; and for Tandberg tape drives, refer to Figures 7-14 and 7-13 for terminator locations.
6. Open the ejectors and align the tape drive with slot MSU1 in module MM0.

   Note: The tape drive always goes in the MSU1 slot of module MM0.
7. Gently slide the drive into the module, pushing on the upper and lower edges to ensure that the drive is fully seated in the module.
8. Close the ejectors.
9. Replace the faceplate.

Figure 7-11
Rear of Archive tape drive showing location of SCSI ID

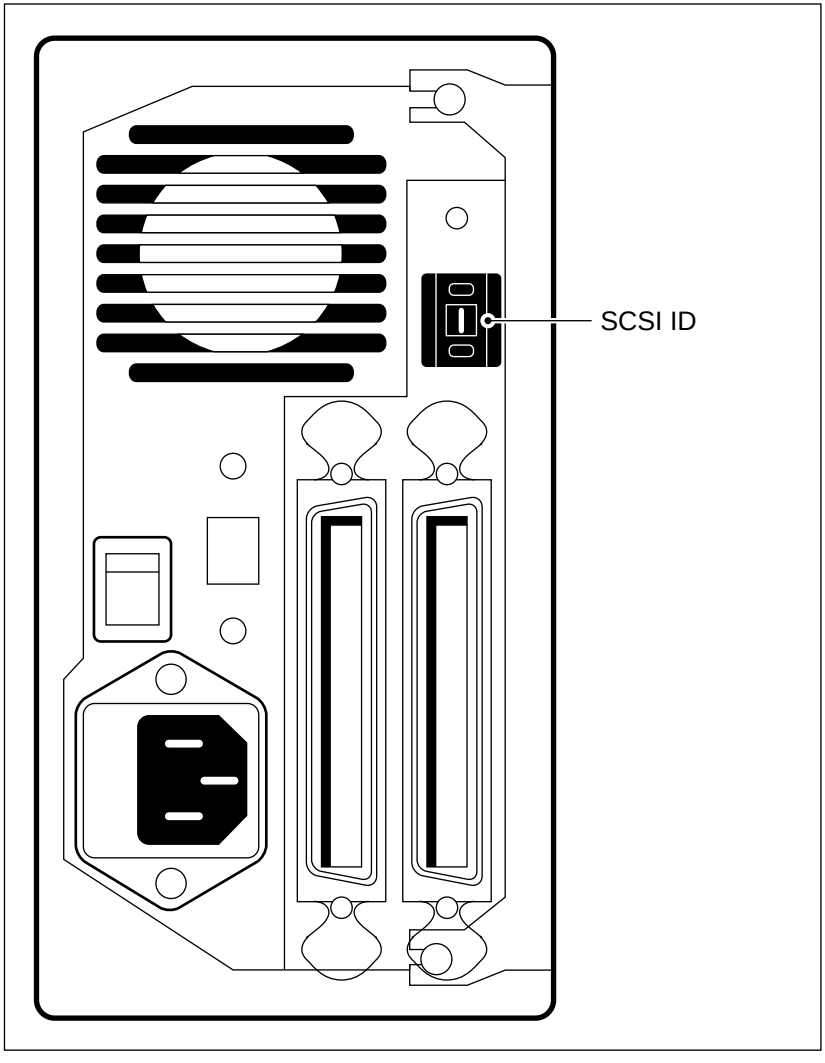


Figure 7-12
Archive tape drive connectors and jumper settings

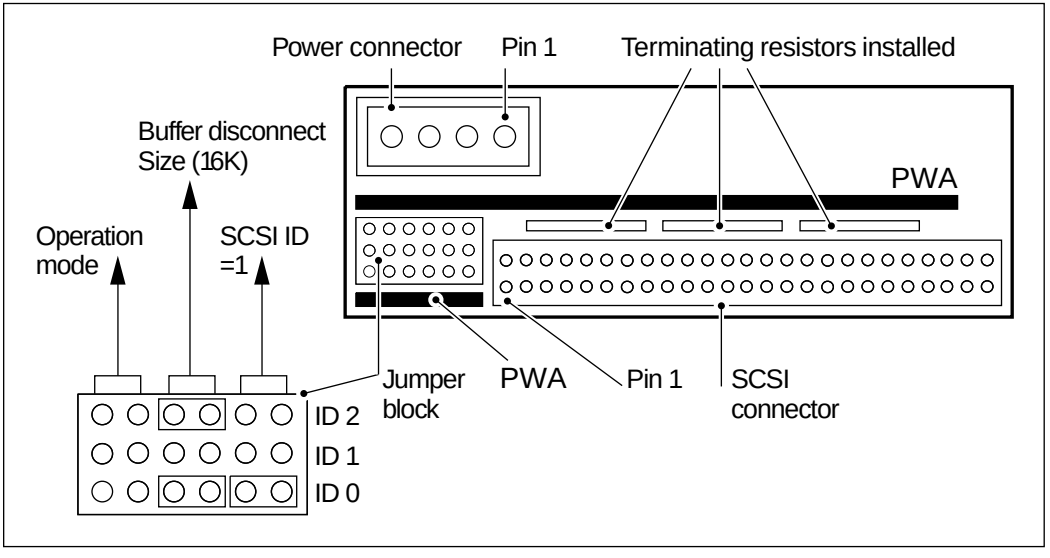
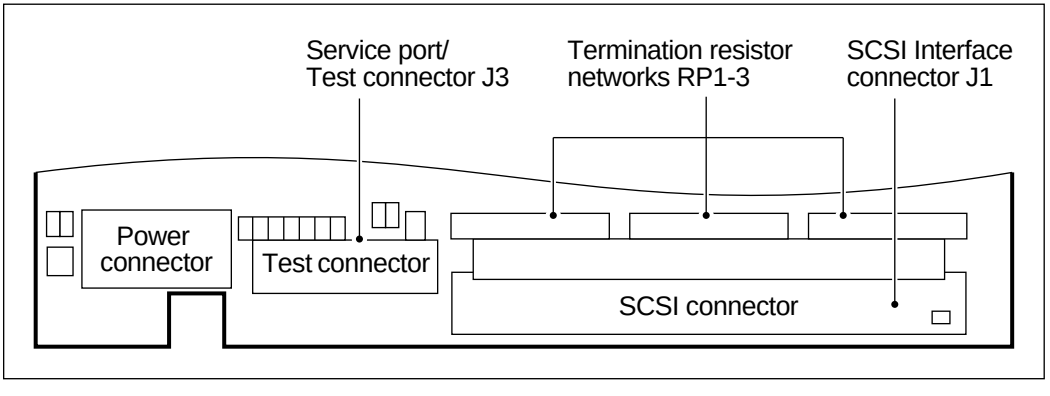
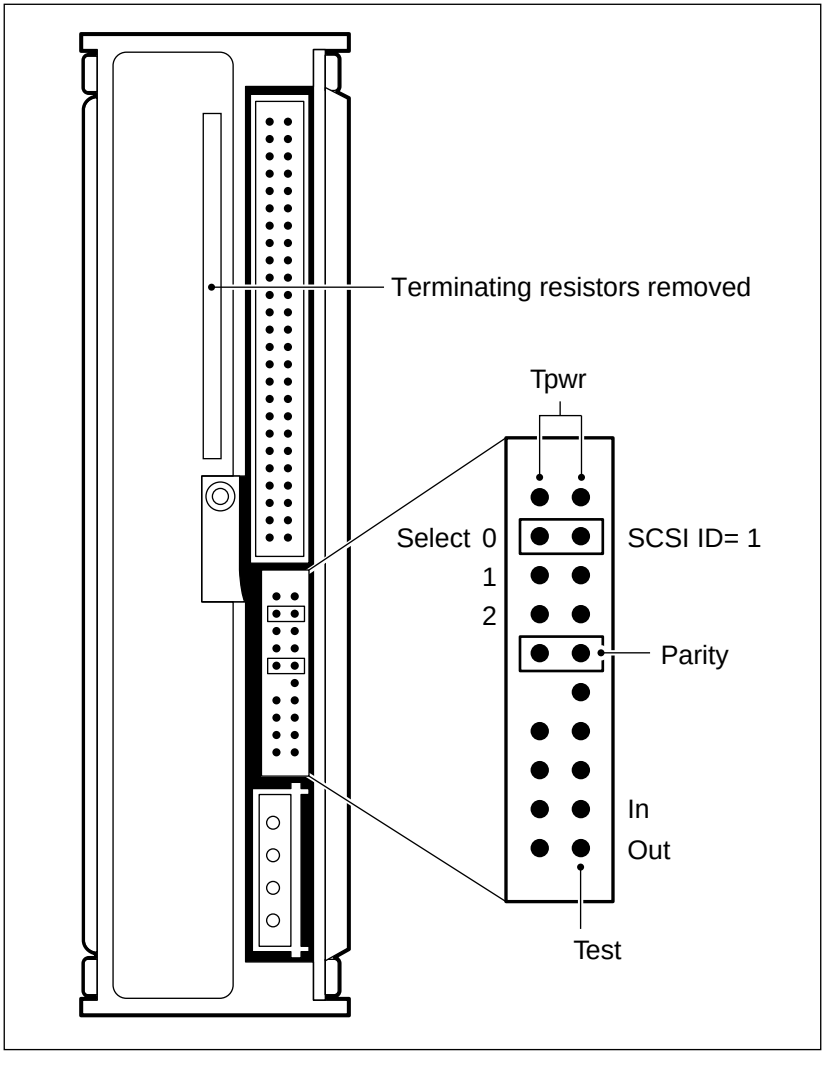


Figure 7-13
Tandberg tape drive connectors (front view)



Note: Terminator resistors are removed.

Figure 7-14
Tandberg tape drive connectors and jumper settings (rear view)



Chapter 8: Configuring the backplane and inspecting the PCPs

Configuring the backplane

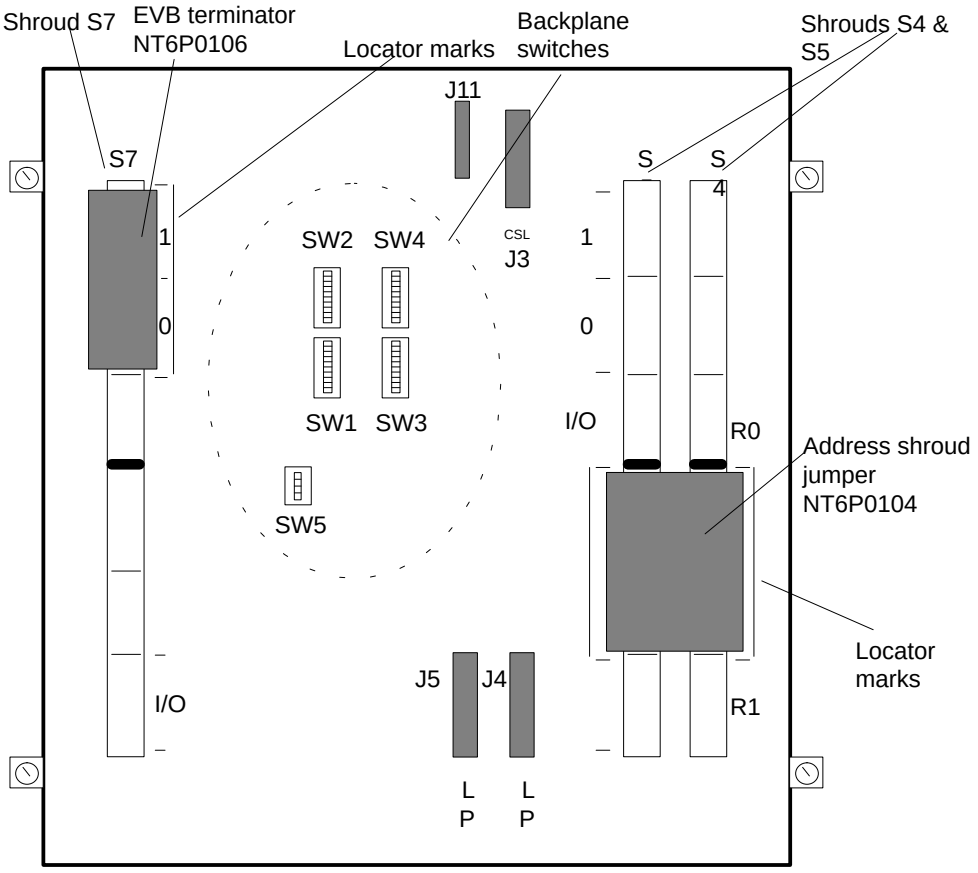
Configuring the backplane consists of the following tasks for each module:

- setting the backplane switches
- installing or removing the address shroud jumper
- installing or removing the EVB shroud terminator

Backplane switch settings

The system is shipped with the backplane switches set for the configuration selected by the customer. However, you should verify the backplane switch settings. Backplane switch locations are shown in Figure 8-1.

Figure 8-1
Location of backplane switches, shrouds, and terminators



Note: S7 is visible when the backplane is viewed at a slight angle. It is normally hidden by the left I/O panel when you look straight into the backplane.

CAUTION
Risk of equipment damage
Wear a grounding strap when working on the backplane. Components attached to the backplane are susceptible to electrostatic damage.

Procedure 8-1
Setting the backplane switches in an unshadowed system

1 To access the backplane, remove the I/O cover by turning each of the four securing screws by approximately one half turn.

CAUTION
Risk of equipment damage
Do not use a lead pencil to change the switch settings. The pencil dust may damage and short the switches. Use an appropriate nonconducting tool.

2 Set backplane switches SW1 and SW3 to the ON position.

3 Set backplane switches SW2 and SW4 to the OFF position.

4 Set SW5 for each module according to the module number as shown in Table 8-1.

Table 8-1
Backplane SW5 switch settings in an unshadowed system

Module number	SW5 settings			
	1	2	3	4
MM0	1	1	0	1
MM1	0	1	0	1

Module references for an unshadowed system

References to modules MM0 and MM1 are to be understood as follows:

- The module containing Meridian Mail node 1 is module MM0.
- The other module in a 2-module system is module MM1.

This Meridian Mail module numbering applies regardless of the placement of modules within a column.

Procedure 8-2
Setting the backplane switches in a shadowed system

1 To access the backplane, remove the I/O cover by turning each of the four securing screws by approximately one half turn.

CAUTION
Risk of equipment damage
Do not use a lead pencil to change the switch settings. The pencil dust may damage and short the switches. Use an appropriate nonconducting tool.

2 Set backplane switches SW1 and SW3 to the off position.

3 Set backplane switches SW2 and SW4 to the on position.

4 Set SW5 for each module according to the module number as shown in Table 8-2.

Table 8-2
Backplane SW5 switch settings in a shadowed system

Module number	SW5 settings			
	1	2	3	4
MM0	1	1	1	1
MM1	0	1	1	1
MM2	1	0	1	1

Module references for a shadowed system

References to modules MM0, MM1, and MM2 are to be understood as follows:

- The module containing Meridian Mail node 1 is module MM0.
- In a 3- or 4-node system, the other module is module MM1.
- In a 5-node system, the other module that contains two nodes (besides module MM0) is module MM1.
- The last module in a 5-node system is module MM2.

Shroud terminators and jumpers

The system is shipped with the shroud terminators and jumpers needed for the configuration selected by the customer. However, you should verify the terminator and jumper locations as described below. Terminator and jumper locations are shown in Figure 8-1.

CAUTION
Risk of equipment damage
The address shroud jumper and the EVB terminator must be installed *very* carefully to avoid damaging the backplane pins.

S4 and S5 address shroud jumper

The address shroud jumper is located at the upper part of the bottom of slots S4 and S5. See Figure 8-1. Locator lines at the left of shroud S5 and the right of shroud S4 mark its location. It is removed *only* in a module in which 3 nodes are located.

Note: The shroud jumper looks like a circuit card.

S7 EVB terminator

The EVB needs to be terminated on the last module of a chain of modules. This requires a terminator across the ‘1’ and ‘0’ positions of shroud S7. See Figure 8-1. Locator lines at the right of shroud S7 mark its location. The only configuration that does not require a terminator is a two- or three-module system that has a utility pack in the last module because the utility card terminates the bus.

Note: The terminator looks like a circuit card.

Printed circuit packs (PCPs)

The following printed circuit packs (PCPs) are used in the Meridian Mail Modular Option EC:

- MMP40 card
- Utility card
- Voice processor cards (VP4 and VP8)

PCPs are shipped in their modules. The following sections are provided to help you to replace PCPs you have removed for any reason and to give you a complete reference of PCP locations.

CAUTION
Risk of equipment damage
Only the voice processor cards are hot-pluggable. That is, you can remove or insert voice processor cards while power to the module is still on. However, the cards must be disabled using the "System Status and Maintenance" function on the administration terminal prior to removal. See the *System Administration Guide* for details on disabling cards.

Removing, inspecting, and installing PCPs

Printed circuit packs (PCPs) are preinstalled in the system before delivery. However you might want to remove the cards to check the switch settings on the utility card and verify that no parts are loose or bent.

Procedure 8-3
Removing, checking, and installing PCPs

CAUTION
Risk of equipment damage
Use extreme care and wear a grounding strap when handling the PCPs. They are susceptible to electrostatic damage and to damage from rough or improper handling.

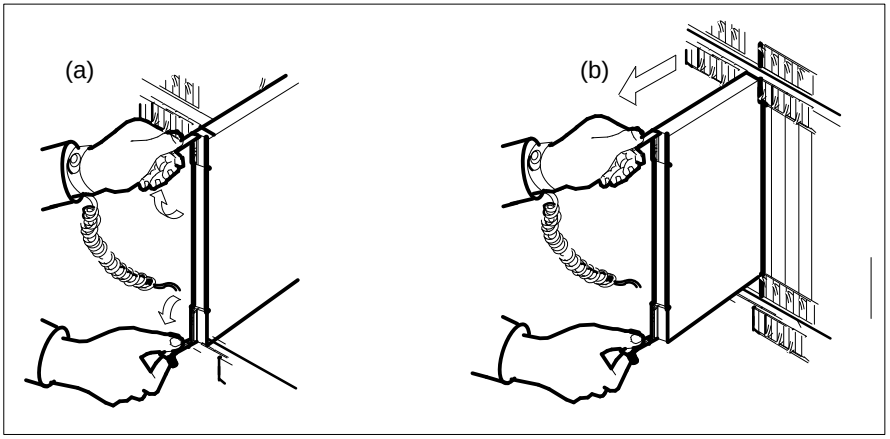
1. Open the ejectors on each card and gently pull the card towards you. (See Figure 8-2).
2. Check each card to make sure that there are no loose parts and it is not bent.
3. Check that the switch settings on each utility card are correct.
   a. For HVS only, set all positions of the onboard switch to on.

      If you have Hospitality Voice Services (HVS), this allows software control of the connection between Meridian Mail and HVS while the faceplate switch is on. If you do not have HVS the onboard switch has no effect.

   b. Set the faceplate switch to NORM.

      While this switch is in the off position, ports 3 and 4 (connectors P2 and P3) of the 5-port RS-232 fanout cable are looped back.
4. If you do not intend to reinstall a card immediately, place it in an electrostatic discharge (ESD) protective container, and place them in a safe location.
5. Reseat the card in the module by aligning it with the slots in the module, ejectors still in the open position, and gently sliding the card back into the module.
6. Seat and lock the card by following the steps listed below:
   a. Push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the module.
   b. Close the ejectors.

Figure 8-2
Card removal



Location of MMP40 cards

The slot location of the MMP40 CPU card in a node depends on the number of nodes in the module. See Tables 8-3 and 8-4, and Figure 8-3.

Table 8-3
Location of MMP40 cards in an unshadowed system

Node	Module	MMP40 card slot
Node 1	MM0	slot 6
Node 2	MM0	slot 7
Node 3	MM0	slot 4
Node 4	MM1	slot 6
Node 5	MM1	slot 7

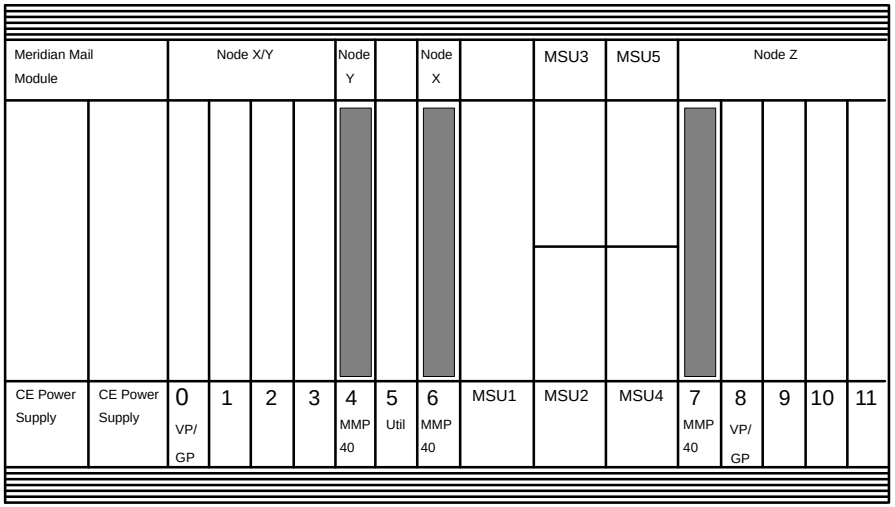
Table 8-4
Location of MMP40 cards in a shadowed system

Node	Module	MMP40 card slot
Node 1	MM0	slot 6
Node 2	MM0	slot 7
–continued–		

Table 8-4
Location of MMP40 cards in a shadowed system (continued)

Node	Module	MMP40 card slot
Node 3	MM1	slot 6
Node 4	MM1	slot 7
Node 5	MM2	slot 6
–end–		

Figure 8-3
Location of MMP40 cards in a shadowed or unshadowed system

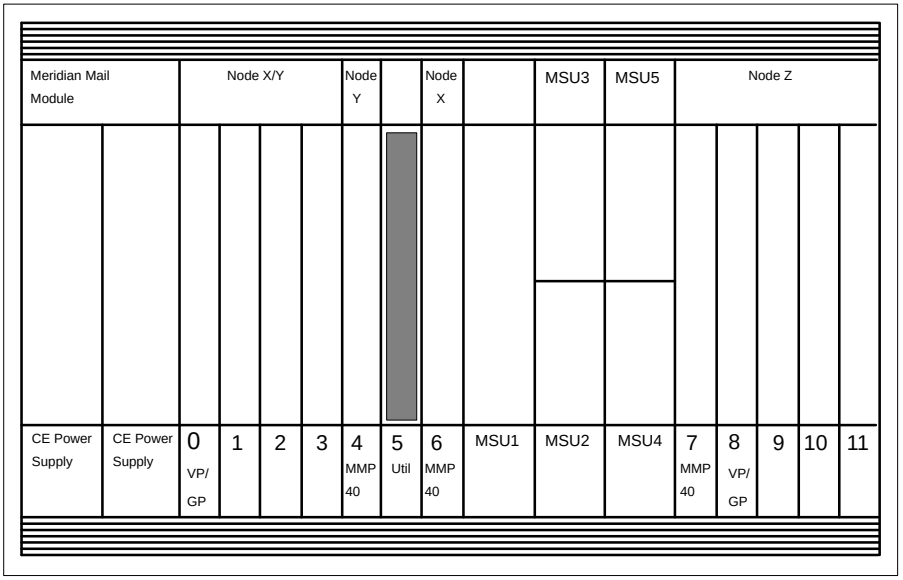


Note: An MMP40 card would go into slot 4 in node 3 of an unshadowed system only. Otherwise, slots 6 and 7 house the MMP40 card in any given module, as shown.

Location of utility cards

There is always a utility card in slot 5 of module MM0. See Figure 8-4. If there is a second utility card, it is located in slot 5 of the last module (that is, in module MM1 for a two-module system, or in module MM2 for a three-module system).

Figure 8-4
Location of utility cards



Location of VP cards

The slot locations of VP cards in a module depends on the number of nodes in the module and the number of ports in the system, as outlined in Tables 8-5 and 8-6. The CPU card used also determines the maximum number of ports allowed per node. The MMP40 card supports up to 96 voice ports. See Tables 8-5 and 8-6.

Note: In a 3-, 4-, or 5-node system, none of the VP cards belong to node 1.

Table 8-5
Location of VP cards in an unshadowed MMP40 system

Number of nodes	Max number of ports	Install VPs in slots	In module
1	24	0 to 3	MM0
2	24 24	0 to 3 8 to 11	MM0 MM0
– continued –			

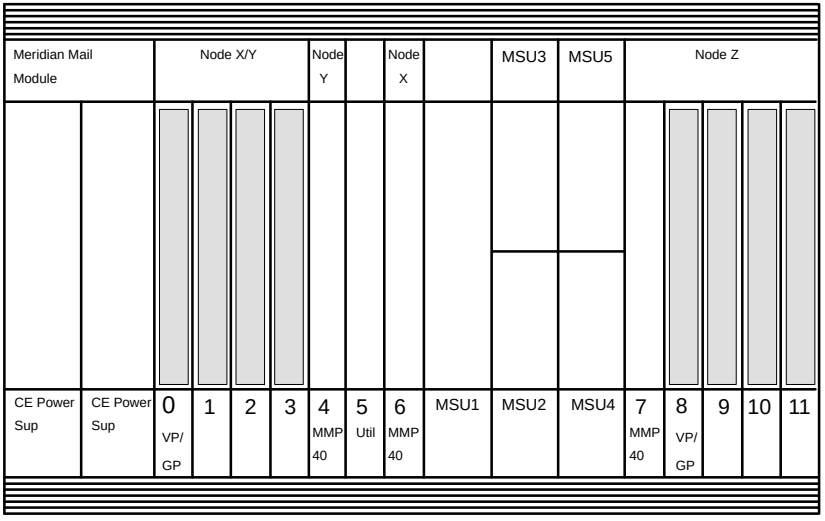
Table 8-5
Location of VP cards in an unshadowed MMP40 system (continued)

Number of nodes	Max number of ports	Install VPs in slots	In module
3	24 24	0 to 3 8 to 11	MM0 MM0
4	24 24 24	0 to 3 8 to 11 0 to 3	MM0 MM0 MM1
5	24 24 24 24	0 to 3 8 to 11 0 to 3 8 to 11	MM0 MM0 MM1 MM1
–end–			

Table 8-6
Location of VP cards in a shadowed MMP40 system

Number of nodes	Max number of ports	Install VPs in slots	In module
1	24	0 to 3	MM0
2	24 24	0 to 3 8 to 11	MM0 MM0
3	24 24	8 to 11 0 to 3	MM0 MM1
4	24 24 24	8 to 11 0 to 3 8 to 11	MM0 MM1 MM1
5	24 24 24 24	8 to 11 0 to 3 8 to 11 0 to 3	MM0 MM1 MM1 MM2

Figure 8-5
Location of VP cards



Note: It is recommended that you fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node. For example, a configuration of VP8, VP8, VP4, VP4 would be acceptable. A configuration of VP8, VP4, VP8 is not recommended due to potential software configuration problems if you later want to expand the number of ports on the node. Also, you cannot skip a voice card slot. For example, a configuration of VP8, blank, VP4 would not be acceptable.

Chapter 9: Installing intra- and intermodule cabling

The following section shows how to route the intra- and intermodule cabling. All cable connections are installed from the rear of the cabinet inside the I/O cover.

Refer to Table 9-1 for a list of cables which are attached to the backplane.

Table 9-1
Cables required

Name	PEC code	Comments
Backplane to I/O cable	NT6P0114 or NT6P0123	These parts differ only in the angle at which the cable exits the connector at the back-plane.
Alarm/MDM cable	NT6P0112	
External voice bus cable	NT6P0111/8/9 or NT6P124/5/6	These parts differ only in the angle at which the cable exits the connector at the back-plane, and in their lengths.

The network loop and AML cabling are dealt with in the chapter “Installing the Meridian Mail to PBX interface.”

The intramodule cabling procedure in this chapter describes the cabling between the backplane and the I/O panel. This includes the backplane to I/O (Procedure 9-2) and backplane to alarm/modem (Procedure 9-3) cables.

The intermodule cabling procedures describe the installation of the external voice bus (EVB) cable between modules or columns. The specific EVB cabling used depends on the number of modules and on whether there are one or two utility cards. Procedures 9-4 to 9-7 cover the combinations available.

Before proceeding with EVB cabling, make sure you are following the procedure for the number of modules and utility cards on the system. Refer to Table 9-2 for a summary of backplane to I/O panel and backplane to next module cables. Refer to Figure 9-2 for an illustration.

References to modules MM0, MM1, and MM2 are to be understood as follows:

- The module containing Meridian Mail node 1 is module MM0.
- The other module in any 2-module system is module MM1.
- In a 5-node shadowed system, the other module that contains two nodes (besides module MM0) is module MM1.
- The last module in a 5-node shadowed system is module MM2.

This Meridian Mail module numbering applies regardless of the placement of modules within a column.

Extraction tool

Follow Procedure 9-1 when removing cables from the backplane shrouds to avoid bending or breaking pins. Do not insert the extraction tool unless the cable connector is locked into the shroud. Do not force the extraction tool deeper than the depth on the cable connector.

CAUTION
Risk of equipment damage
I/O-to-backplane cables NT6P0123 and NT6P0114, and EVB cables NT6P0111/8/9 and NT6P0124/5/6 have high density connectors. If you need to remove the cables, follow Procedure 9-1.

Procedure 9-1
Using the high density connector extraction tool

1 Grasp the cable connector by the strain relief tab.

2 Center the longer flat edge on the angled end of the tool between the cable connector and the wall of the shroud on the right side of the cable connector. See Figure 9-1.

Note: If the straight end of the tool is notched, use that end if the connector can be accessed straight-on. If you must angle the tool at all, use the angled end.

3 Gently insert the extraction tool and gradually press the other end of the tool towards the cable, while gently rocking the cable connector up and down. Do not force the connector.

CAUTION
Risk of cable damage
Forcing the connector may damage the cable.

4 Stop applying pressure as soon as the cable connector comes loose from the shroud.

5 Slowly remove the extraction tool and the cable connector.

Figure 9-1
Extraction tool

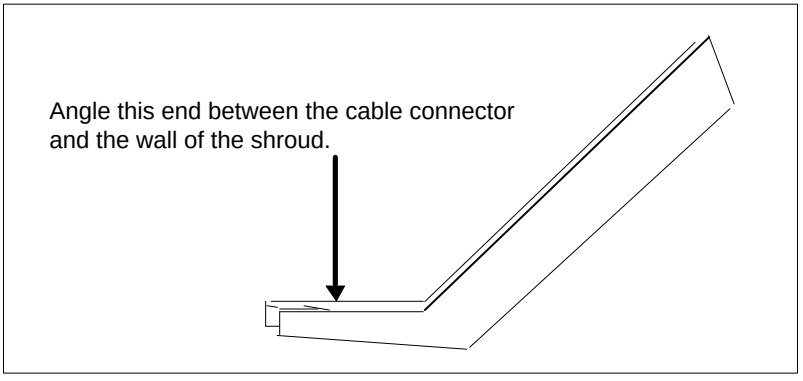
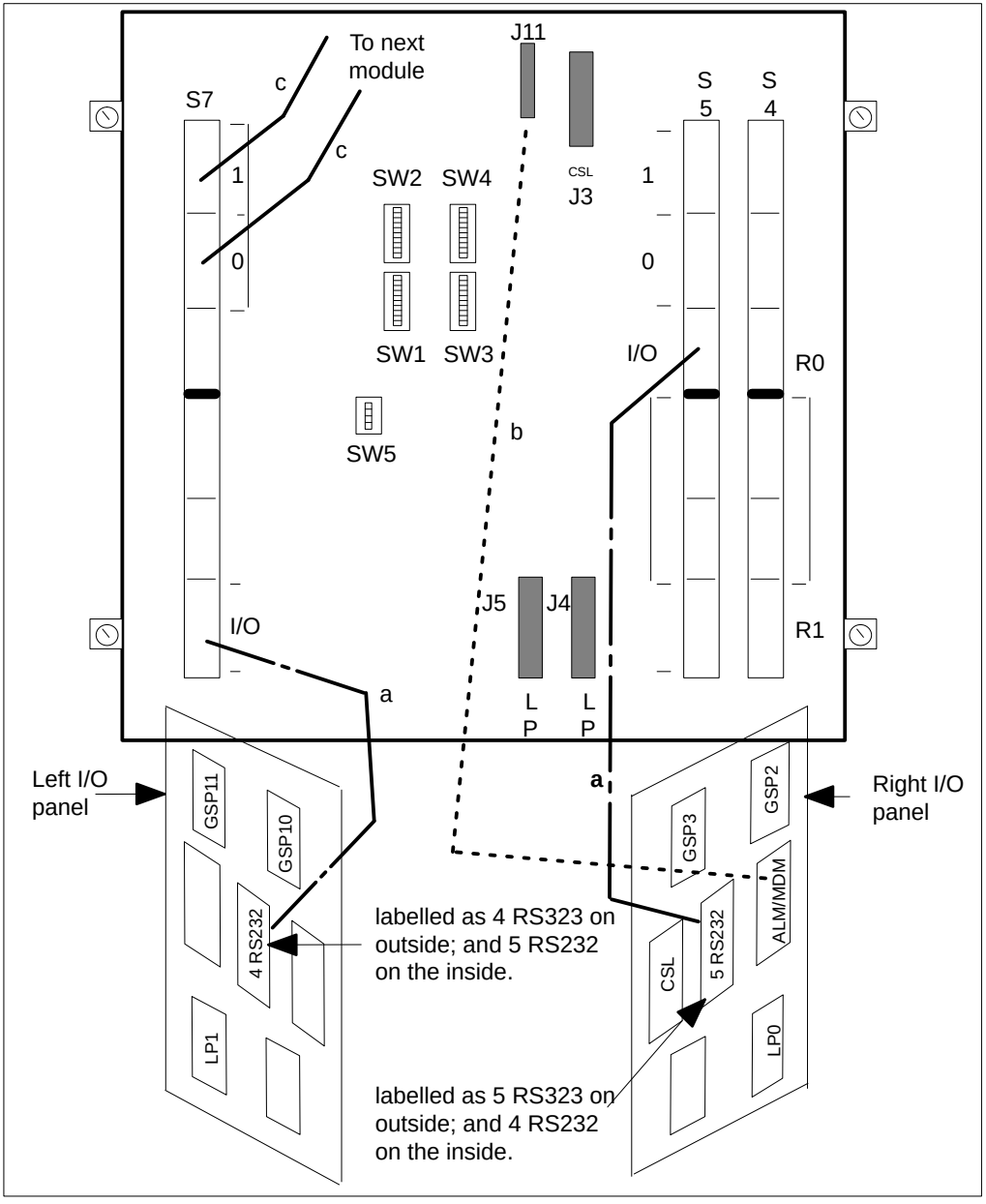


Table 9-2
Summary of cabling from backplane to I/O panel and other modules

Figure reference	NT code	Cable	Routing summary
cable a	NT6P0114 or NT6P0123	I/O to back-plane	**5 port RS232:** From shroud S5, I/O position, to the '5-RS232' connector on the inside of the right I/O panel ***Note:*** The 5-port RS232 cable NT6P0109 connects to the '5 RS232' connector on the outside of the right I/O panel. **4 port RS232:** From shroud S7, I/O position, to the '4 RS232' connector on the inside of the left I/O panel ***Note:*** The 4-port RS232 cable NT6P0110 connects to the '4-RS232' connector on the outside of the left I/O panel.
cable b	NT6P0112	Alarm/MDM	From J11 to ALM/MDM connector on right I/O panel
cable c	NT6P0111 or NT6P0124 (30 in., 76 cm) NT6P0118 or NT6P0125 (60 in., 152 cm) NT6P0119 or NT6P0126 (96 in., 244 cm)	External voice bus	This pair of cables connects modules together. They run from shroud S7 on one module to shroud S5 or S7 on the next module, depending on whether the next module contains a utility card. Refer to the procedures 9-4 to 9-7.

Figure 9-2
Backplane to I/O panel and next module cabling



Installing cables from backplane to I/O panel

Installing RS232 cables

The following procedures describe connecting the 5-port and 4-port RS232 cables and connecting the alarm/modem cable from the backplane to the I/O panel.

CAUTION
Risk of equipment damage
I/O-to-backplane cables NT6P0123 and NT6P0114 have high density connectors at the backplane end. These connectors must be installed *very* carefully to avoid damaging the pins. Line up the connector at right angles to the backplane, and press gently until you hear a 'click.' If you need to remove the cables, use an extraction tool (P0741489), and follow Procedure 9-1.

Procedure 9-2
Installing RS232 cables

You will need two I/O-to-backplane cables (NT6P0123 or NT6P0114), one 5-port fanout cable (NT6P0109), and one 4-port fanout cable (NT6P0110) for each module, except the last module in a 5-node shadowed system which does not use the 4-port cable. Refer to Figure 9-3 for this procedure.

I/O to backplane cables

1. Connect an I/O-to-backplane cable from the I/O position on shroud S5 to the 5 RS232 connector on the inside of the right I/O panel.
2. Connect the end of an I/O-to-backplane cable from the I/O position on shroud S7 to the 4 RS232 connector on the inside of the left I/O panel.

   Note: The connectors on the I/O panels are labelled differently on the inside and outside of the panel. Ensure that the I/O backplane cable is connected correctly. (See Figure 9-2).

4-port RS232 cable

3. Connect the single connector end of the 4-port fanout cable to the 4 RS232 connector on the outside of the left I/O panel.

5-port RS232 cable

4 Connect the single connector end of the 5-port fanout cable to the 5 RS232 connector on the outside of the right I/O panel.

Installing the alarm/modem cable

Procedure 9-3
Installing alarm/modem cable

You will need one alarm/modem cable (NT6P0112). Refer to Figure 9-2 for this procedure.

1 Connect one end of the cable to the J11 connector on the backplane.

2 Connect the other end to the ALM/MDM connector on the inside of the right I/O panel.

Intermodule bus cable connection

Installing the external voice bus cable

The EVB cable (NT6P0111/8/9 or NT6P0124/5/6) connects one module to another. The EVB cable does not come preinstalled with the system. The exact cabling depends on the number of modules and utility cards in the system, and the relative location of one module to another. Refer to Table 9-3 to find the appropriate procedure for the system you are installing. If the system has two columns, also refer to the section “Installing EVB cables between columns” located near the end of this chapter.

Note: The EVB cable *cannot* be routed through the I/O panel.

Table 9-3
EVB cabling guide

Number of utility cards	Number of modules	Procedure to use
1	2	9-4
2	2	9-5
1	3	9-6
2	3	9-7

The EVB needs a terminator (NTP0106) on the last module of a chain of modules unless the last module contains a utility card. In this case, the utility card on the last module acts as a terminator. See the appropriate procedure for details.

CAUTION
Risk of equipment damage
External voice cables NT6P0111/8/9 and NT6P0124/5/6 have high density connectors. These connectors must be installed *very* carefully to avoid damaging the pins. Line up the connector at right angles to the backplane, and press gently until you hear a 'click'. If you need to remove the cables, use an extraction tool (P0741489), and follow the procedure at the end of this chapter.

Procedure 9-4
EVB cabling—two modules, one utility card

You will need one pair of EVB cables (NT6P0111/8/9 or NT6P0124/5/6, depending on which length you need) and an EVB terminator (NT6P0106). (See Figure 9-3, diagram A.)

1. Connect one end of an EVB cable from position 1 on shroud S7 of module MM0 to position 1 on shroud S5 of module MM1.
2. Connect one end of an EVB cable from position 0 on shroud S7 of module MM0 to position 0 on shroud S5 of module MM1.
3. Install the EVB terminator in positions 1 and 0 of shroud S7 of module MM1.

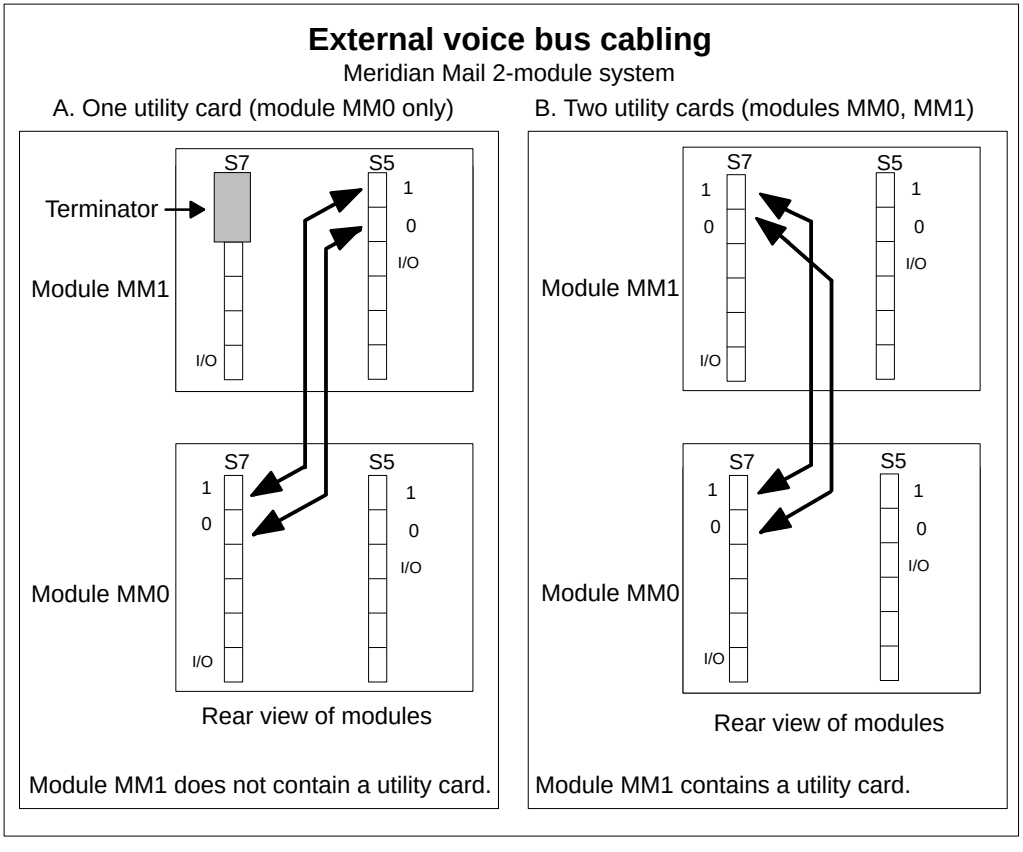
Procedure 9-5
EVB cabling—two modules, two utility cards

Note: No EVB terminator is required in this configuration.

You will need one pair of EVB cables (NT6P0111/8/9 or NT6P0124/5/6 depending on which length you need). (See Figure 9-3, diagram B.)

1. If there is an EVB terminator in positions 1 and 0 of shroud S7 of module MM1, remove it, label it as 'EVB terminator', and store it safely.
2. Connect one end of an EVB cable from position 1 on shroud S7 of module MM0 to position 1 on shroud S7 of module MM1.
3. Connect one end of an EVB cable from position 0 on shroud S7 of module MM0 to position 0 on shroud S7 of module MM1.

Figure 9-3
Intermodule cabling for a two-module system



Procedure 9-6
EVB cabling—three modules, one utility card

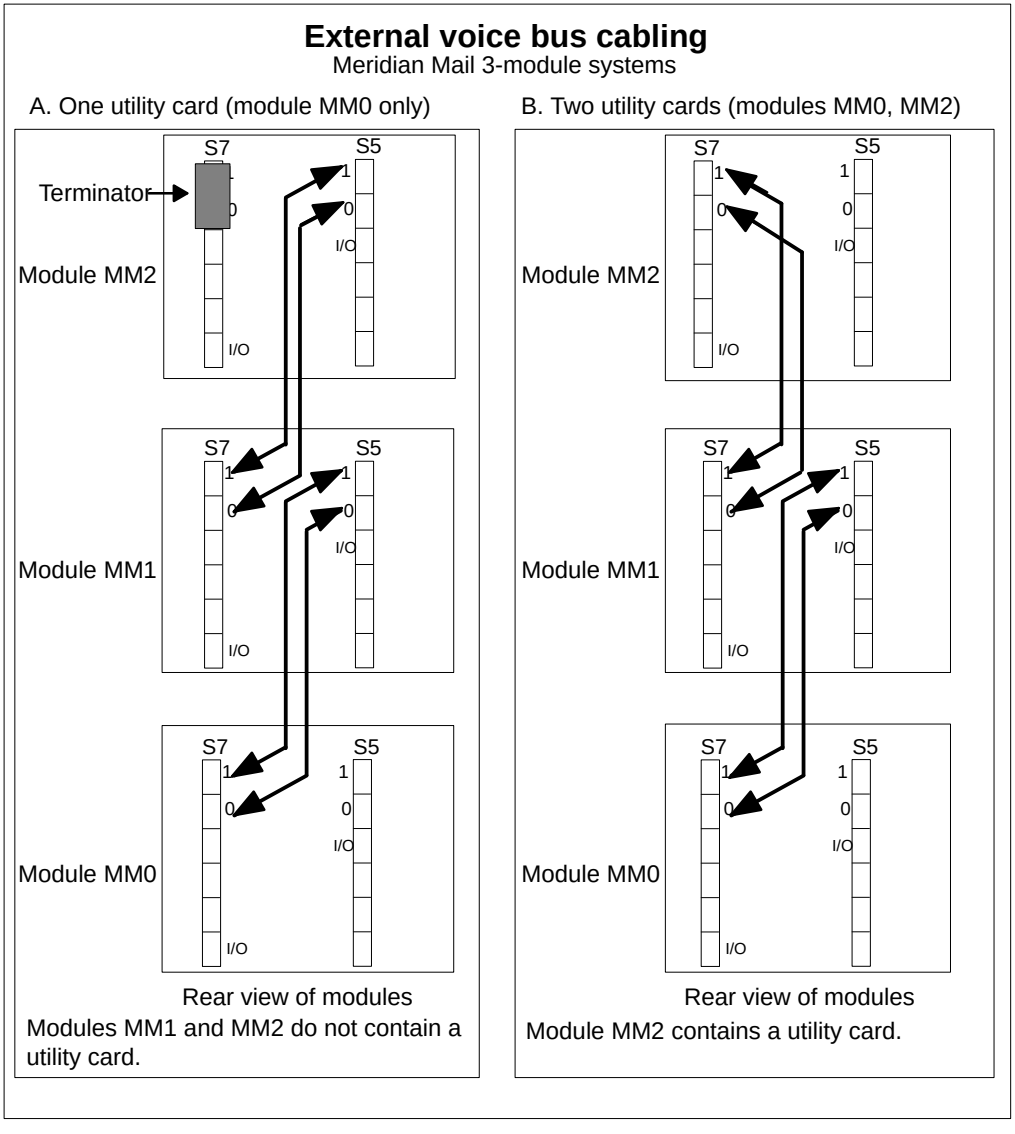
The following procedure applies to connecting modules in which there is only one utility card (NT6P03AA).

> ***Note:*** This is an unusual configuration. Normally, a five-node system would use more than 48 ports, and would need three or four network loops and two utility cards.

You will need two pairs of EVB cables (NT6P0111/8/9 or NT6P0124/5/6 depending on which length you need) and an EVB terminator (NT6P0106). (See Figure 9-4, diagram A.)

1. Connect an EVB cable from position 1 on shroud S7 of module MM0 to position 1 on shroud S5 of module MM1.
2. Connect an EVB cable from position 0 on shroud S7 of module MM0 to position 0 on shroud S5 of module MM1.
3. Connect an EVB cable from position 1 on shroud S7 of module MM1 to position 1 on shroud S5 of module MM2.
4. Connect an EVB cable from position 0 on shroud S7 of module MM1 to position 0 on shroud S5 of module MM2.
5. Connect the EVB terminator in positions 1 and 0 of shroud S7 of module MM2.

Figure 9-4
Intermodule cabling for a three-module system



Procedure 9-7
EVB cabling—three modules, two utility cards

The following procedure applies to connecting modules in which there is one utility card in module MM0 and a second utility card in module MM2.

Note: No EVB terminator is required in this configuration.

You will need two pairs of EVB cables (NT6P0111/8/9 or NT6P0124/5/6 depending on which length you need). (See Figure 9-4, diagram B.)

1. If there is an EVB terminator in positions 1 and 0 of shroud S7 of module MM1 or module MM2, remove it, label it as 'EVB terminator', and store it safely.
2. Connect one end of an EVB cable from position 1 on shroud S7 of module MM0 to position 1 on shroud S5 of module MM1.
3. Connect one end of an EVB cable from position 0 on shroud S7 of module MM0 to position 0 on shroud S5 of module MM1.
4. Connect one end of an EVB cable from position 1 on shroud S7 of module MM1 to position 1 on shroud S7 of module MM2.
5. Connect one end of an EVB cable from position 0 on shroud S7 of module MM1 to position 0 on shroud S7 of module MM2.

Installing EVB cables between columns

The cabling between columns is identical to the intermodule cabling described in procedures 9-4 to 9-7 of this chapter with the following cabling restrictions:

- Cable routing follows the same routing restrictions for column-to-column interface as outlined in *SL-1 System Installation Procedures* (NTP 553-3001-210).
- Maximum cable length between modules is 244 cm (96 inches). EVB cabling comes in three lengths: 76 cm (30 inches), 152 cm (60 inches), and 244 cm (96 inches), with part numbers NT6P0111/8/9 or NT6P0124/5/6 respectively. Offset modules will probably require the longer cables.

Chapter 10: Installing, cabling, and configuring peripheral devices

Peripheral devices

Peripheral devices for Meridian Mail include the following:

- administration terminal and printer
- additional terminals for user administration, if required
- A/B switchbox and local modem (for remote support)

  Note: To get full support from Northern Telecom, you must install an A/B switchbox and local modem, and connect the modem to a functioning phone line. These devices allow Northern Telecom support personnel to dial in to the system and provide diagnosis and maintenance. This facility is under the control of an onsite technician who 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

If you are using the Meridian Mail Reporter (MMR) package, refer to the *Meridian Mail Reporter User Guide* for installation instructions for MMR.

Note 1: The *Meridian Mail Reporter User Guide* will be available for distribution either at the end of 1995, or the beginning of 1996.

Note 2: See *X11 System Management Applications* (NTP 553-3001-301) for information about Single Terminal Access.

Installation overview

The installation of the peripheral devices is described in the following sequence:

1 Installation of the A/B switchbox

2 Installation and configuration of the administration terminal

3 Installation of the multiple user administration terminals (MATs) if you have the Multiple User Administration feature

4 Installation and configuration of the administration printer and connecting it to the administration terminal

5 Installation of the local modem

6 Installation of the remote terminal and modem, if used

7 Installation of the guest administration consoles (GACs) if you have the Hospitality feature

8 Installation of networking modems if used

The cabling described here uses the rear I/O panels and the 4- and 5-port RS232 fanout cables described in Chapter 9. Alternative cabling, using the MDF, is described later in this chapter.

Installing the A/B switchbox

The A/B switchbox is required to permit remote support by Northern Telecom (see Figure 10-1) .

Procedure 10-1
Installing the A/B switchbox

1 Place the A/B switchbox in a suitable location within 1.5 metres (15 feet) of Meridian Mail.

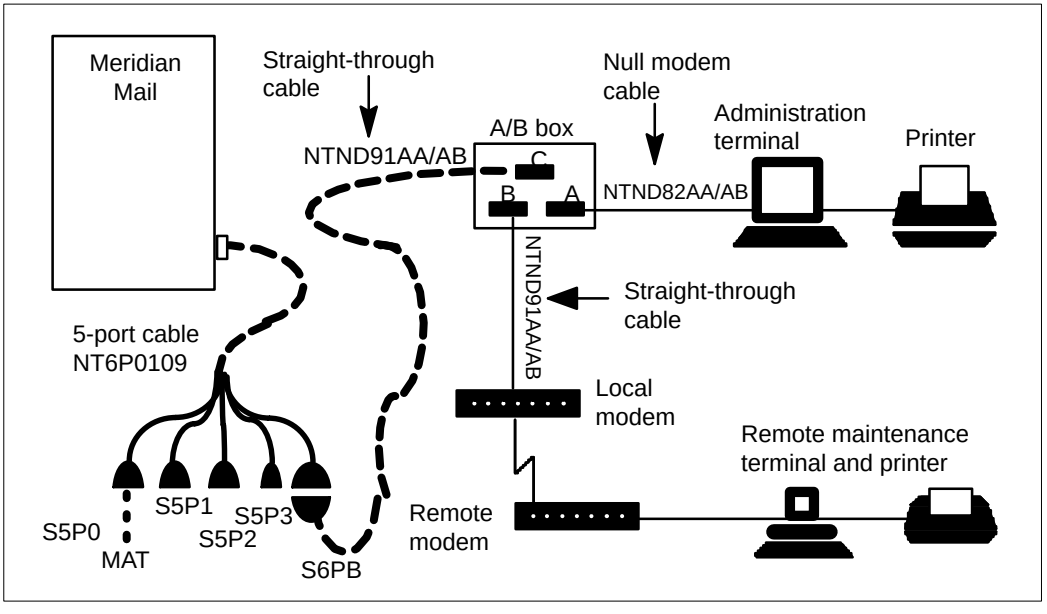
Although the switchbox may not be exactly as indicated in this document, the installation is the same. See the instructions provided with the switchbox for specific details.

2 Set the switch on the front of the A/B switchbox to the “A” position.

a. Label the A switch position “local.”

b. Label the other position “remote.”

Figure 10-1
A/B switchbox for remote administration and maintenance



Installing the primary administration terminal and multiple user administration terminals (MATs)

Follow Procedure 10-2 to install the primary administration terminal. Follow Procedure 10-3 to install the multiple user administration terminals (MATs).

Procedure 10-2
Installing the primary administration terminal

1 Place the administration terminal in a suitable location.

The administration terminal should be installed within 15.2 metres (50 feet) of the Meridian Mail system. If the cable distance is greater than 15.2 metres (50 feet), 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, using an INMAC 328 adaptor. Depending on the type of terminal, you may also have to use a 6 to 25-pin adaptor which is supplied with the terminal.

If you are using an A/B switch proceed directly to step 5; otherwise, proceed with step 4 if you are not using an A/B switch.

4 If you are not using an A/B switch, connect the other end of the cable to the connector labeled SLT6-PB on the 5-port fanout cable connected to the Meridian Mail right I/O panel. Proceed with step 6.

5 If you are using an A/B switch (see Figure 10-1)

   a. Connect the other end of the cable to the connector labeled A on the A/B switch.

   b. Connect one end of a straight RS232 cable (NTND91AA/AB) to the 5 port RS232 connector labeled SLT6-PB.

   c. Connect the other end of this 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 the appendix “Terminal configuration” for your type of terminal.

Procedure 10-3
Installing a MAT

Up to three MATs are connected to connectors on a 4- or 5-port RS232 fanout cable. Only one MAT is allowed on any node. If node 1 has two GACs, it may not also have a MAT.

Note: You must have the multiple administration terminals (MAT) feature installed.

1 Place the terminal in a suitable location within 15.2 metres (50 feet) of the Meridian Mail system.

If the cable distance is greater, a pair of limited distance modems (LDMs) is required.

2 Connect the keyboard and power cord to the terminal.

3 Connect one end of the null modem terminal cable (NDND82AA/AB) to the COMM connector on the terminal, using an INMAC 328 adaptor.

Depending on the type of terminal, you may also have to use a 6- to 25-pin adaptor which is supplied with the terminal.

4 Connect the other end of the cable to a connector labeled SLT5-P*x* on the 5-port fanout cable connected to the Meridian Mail right I/O panel, or SLT4-P*x* on the 4-port fanout cable connected to the Meridian Mail left I/O panel. This connector, *x*, must correspond to a port that has been configured for a MAT.

   See Table 10-5 (unshadowed system) or Table 10-6 (shadowed system) for the correspondence between fanout cable connector labels and ports configured during system installation or modification. See "Modify hardware" in *System Administration Tools* (NTP 555-7001-305) for recommended dataport usage.

5 Plug the terminal power cord into an AC receptacle.

6 Power on the terminal.

7 Configure the terminal as described in the appendix "Terminal configuration" for your type of terminal.

   Note: A port should have been configured at software installation time for each MAT. If this was not done, you will need to reconfigure the ports from the administration terminal. Go to the Tools level on the MMI and select "Configure MATs" to configure ports as MATs. See *System Administration Tools* (NTP 555-7001-305).

Installing and configuring the LA75 Plus Companion printer

Install the LA75 Plus Companion printer as described in Procedure 10-4 and configure the printer as described in Procedure 10-5. Note that cables and adaptors needed vary with the type of terminal you are using.

Note: The default baud rate for the LA75 is 4800 bps.

Procedure 10-4
Installing the LA75 Plus Companion printer

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 Figure 10-2.

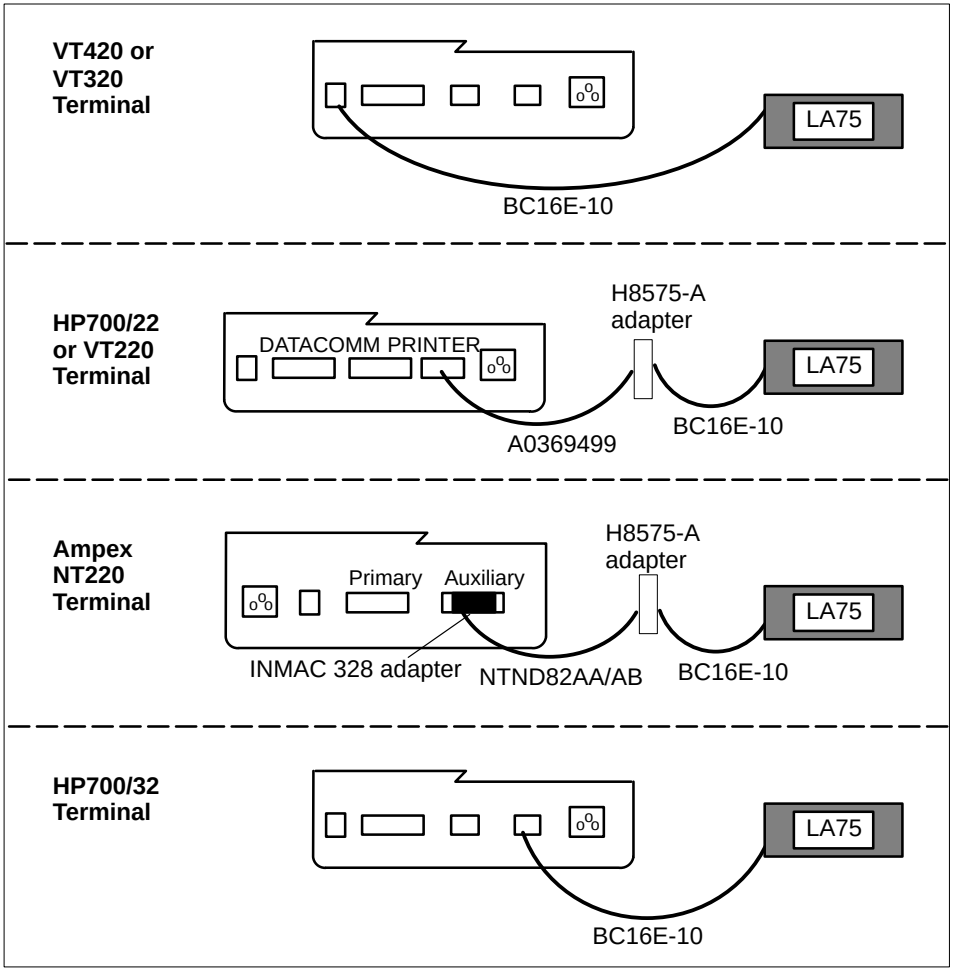
4 Connect the other end of the cable, using adaptors and cables as needed, to the terminal. See Figure 10-2 for details of the required cables and adaptors.

5 Plug the printer power cord into an AC receptacle.

6 Leave the printer powered off to start configuration.

7 Configure the printer as described in Procedure 10-5.

Figure 10-2
LA75 Plus Companion printer connections to administration terminals

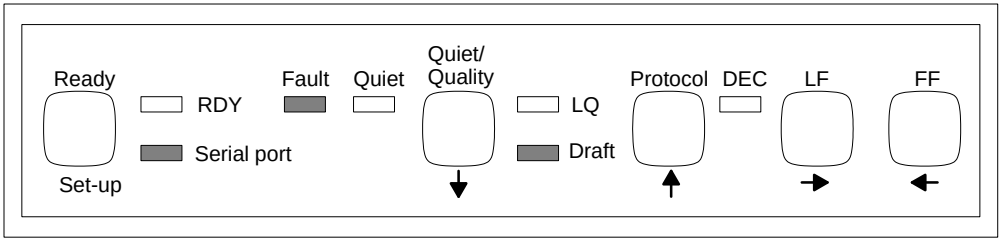


Procedure 10-5
Configuring the LA75 Plus Companion printer

1. Ensure 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. Release the Set-up button one to two seconds after powering on. See Figure 10-3 for the layout of the front panel.

   The printer will automatically print out 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.)

Figure 10-3
Front control panel on LA75 Plus Companion printer



3. If you want to change the value of the current setting, press the left arrow key on the front of the printer. See Table 10-1 for the required values.

   The current feature number is printed again with the new value.
4. If this is not the value you require, press the the left arrow key again and the next value for that feature number is printed.

   Refer to the user manual that is provided with the printer for the list of values available for each feature.
5. Repeat step 4 until the value that you want for this feature is printed. Press the down arrow key to move on to the next feature.
6. Repeat steps 4 and 5 until you have selected the required values for all of the features.
7. Press the Set-up button on the front of the printer to save the settings.

Table 10-1
LA75 printer default settings

Feature number	Name	Re-quired value	Meaning
Generic 1	Protocol at Power-up	3	Port dependent
Generic 2	Form length	9	11 inches (A)
Generic 3	Vertical pitch	4	6 lines per 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 characters per inch (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

Installing and configuring the HP Thinkjet printer

Procedure 10-6
Installing the HP Thinkjet printer

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 Figure 10-4.

4 Connect the other end of the cable, using an adaptor if needed, to the administration terminal. See Figure 10-4 for details of the required cables and adaptors.

5 Set the printer switches as shown in Tables 10-2 and 10-3. Figure 10-5 shows the location of the switches.

6 Plug the printer power cord into an AC receptacle.

7 Power on the printer.

Figure 10-4
HP Thinkjet printer connections to administration terminals

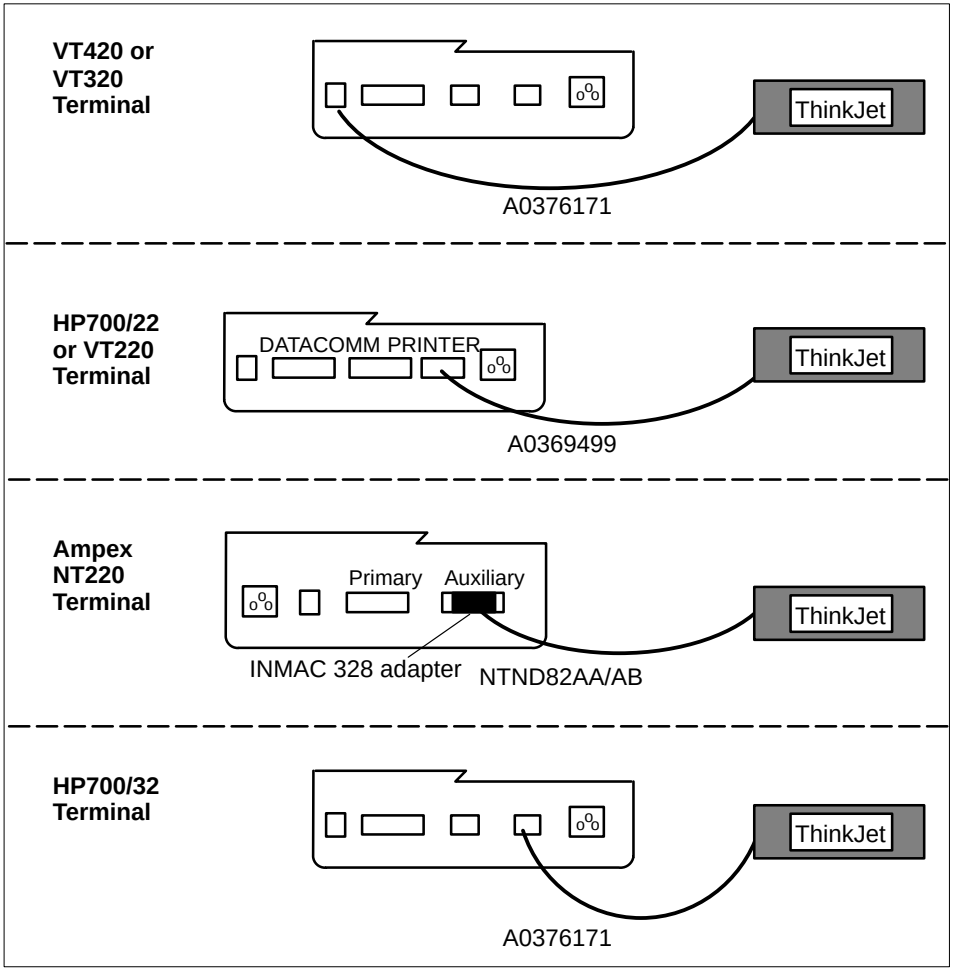


Figure 10-5
HP Thinkjet printer switch locations

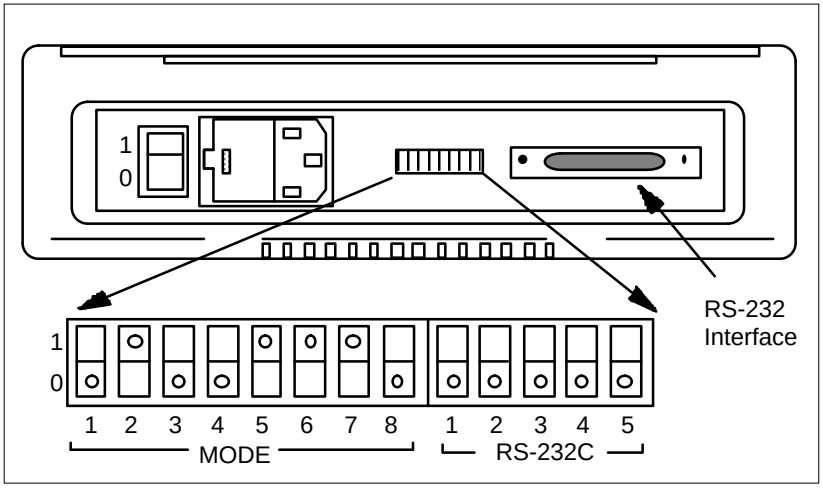


Table 10-2
HP Thinkjet printer mode switch settings

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

Table 10-3
Printer RS232 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 local modems

Follow Procedures 10-7 and 10-8 to install and configure the local modem using the AT command method. If you have a UDS 2440 modem, you may prefer to use the front panel method. Refer to the appendix “Modem configuration” for more information on modem configurations.

Procedure 10-7
Installing the local modem

1. Connect one end of a straight RS232 cable (NTND91AA/AB) to the modem connector labeled
   - RS232/EIA for Ven-Tel modems
   - DTE for UDS modems
2. Plug the modem power cord into an AC receptacle.
3. Power on the modem.

Procedure 10-8
Configuring the local modem

1. For Ven-Tel modems only, set the internal switches. Refer to the appendix entitled “Modem configuration” for detailed instructions.
2. Temporarily disconnect the administration terminal from the A/B switchbox.
3. Connect the free end of the modem cable to the terminal for the purpose of configuring the modem.
4. Configure the modem. Refer to the appendix entitled “Modem configuration” for configuration procedures for your modem type.
5. Disconnect the administration terminal from the modem cable.
6. Reconnect the administration terminal to the A/B switchbox.

7 Connect the free end of the modem cable to the B connector on the A/B switchbox.

8 Connect the modem to the phone line provided for remote support.

Installing and configuring remote modems

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

Follow Procedure 10-9 if you want to configure the remote modem using the administration terminal; otherwise, follow Procedure 10-10 to install and configure the remote terminal.

Procedure 10-9
Configuring the remote modem using the administration terminal

1 For Ven-Tel modems only, set the internal switches. Refer to the appendix entitled “Modem configuration” for detailed instructions.

2 Connect one end of a straight RS232 cable (NTND91AA/AB) to the modem connector labeled

- RS232/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 the appendix entitled “Modem configuration” 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.

Procedure 10-10
Installing the remote terminal and modem

1. Place the terminal and the modem in a suitable location.
2. Connect the keyboard and power cord to the terminal, and the power cord to the modem.
3. Connect one end of a straight-through RS232 cable to the COMM connector on the terminal, via an INMAC 328 adaptor.

   Depending on the type of terminal, you may also have to use a 6 to 25-pin adaptor which is supplied with the terminal.
4. Connect the other end to the modem.
5. Plug the terminal and modem power cords into an AC receptacle.
6. Power on the terminal and modem.
7. Configure the terminal as described in the appendix “Terminal configuration” for your terminal.
8. If you did not already configure the modem, do so now. Refer to the appendix “Modem configuration” for configuration procedures for your modem type.
9. Connect the modem to the phone line used to dial in for remote administration.

Installing and configuring the Guest Administration Console

Follow Procedure 10-11 to install and configure the Guest Administration Console (GAC).

Note 1: You must have the Hospitality feature installed.

Note 2: Up to 2 GACs can be connected to node 1. Only 1 GAC can be connected to any other node. The maximum number of GACs allowed for an entire system is 4.

Note 3: If node 1 has a MAT (multiple administration terminal), only one GAC may be connected to the node.

Procedure 10-11
Installing a guest administration console (GAC)

1. Connect one end of a null modem cable to a connector labeled SLT5-P*x* on the 5-port fanout cable connected to the Meridian Mail right I/O panel, or to the SLT4-P*x* on the 4-port fanout cable connected to the Meridian Mail left I/O panel. See Figure 10-6.

   This connector, x, must correspond to a port that has been configured for a GAC.

See Table 10-5 (unshadowed system) or Table 10-6 (shadowed system) for the correspondence between fanout cable connector labels and ports configured during system installation or modification. See *System Administration Tools* (NTP 555-7001-305) for recommended dataport usage.

2 Connect the other end to the “Comm” connection on the GAC.

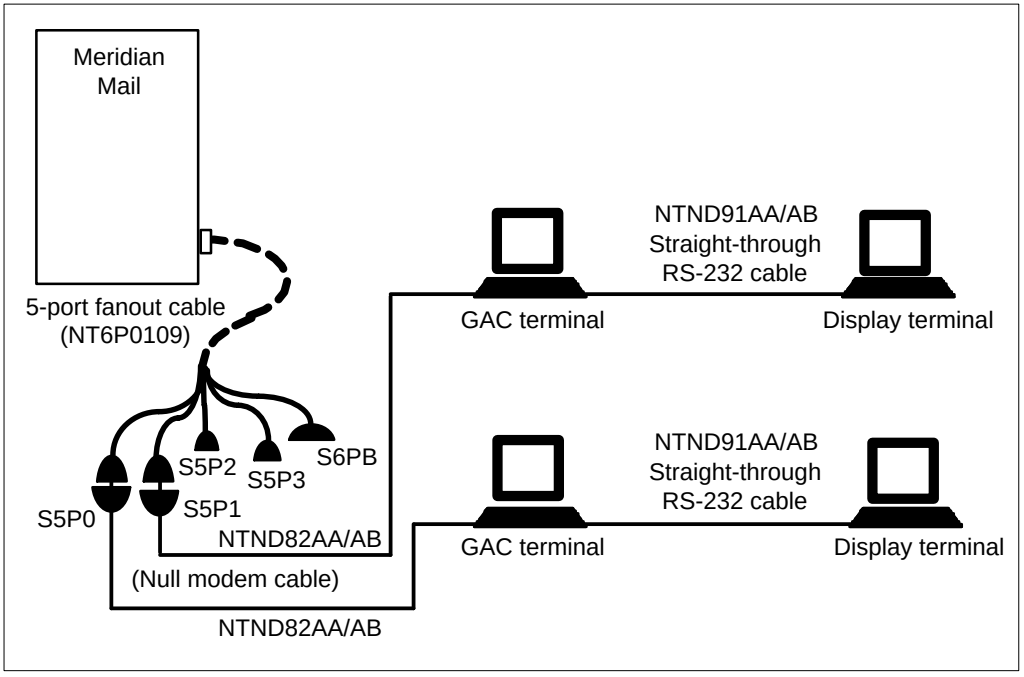
3 Connect one end of a straight-through RS232 cable to the printer port of the GAC.

4 Connect the other end to the “Comm” port on the display-only console.

5 Configure the terminal as described in the appendix “Terminal configuration.”

Note: A port should have been configured at software installation time for each GAC. If this was not done, you will need to reconfigure the ports from the administration terminal. Go to the Tools level on the MMI and select “Configure GACs” to configure ports as GACs. See *System Administration Tools* (NTP 555-7001-305).

Figure 10-6
GAC terminal



Installing a networking modem

Follow Procedure 10-12 to install a networking modem.

Procedure 10-12
Installing a networking modem

1 Connect one end of a null modem cable to a connector labeled SLT5-P*x* on the 5-port fanout cable connected to the Meridian Mail right I/O panel.

This connector, x, must correspond to a port that has been configured for a networking modem.

See Table 10-5 (unshadowed system) or Table 10-6 (shadowed system) for the correspondence between fanout cable connector labels and ports configured during system installation or modification. See *System Administration Tools* (NTP 555-7001-305) for recommended dataport usage.

2. Connect the other end to the RS232/EIA connection on the modem.
3. Configure the modem as described in the chapter “Installing Meridian Networking hardware” in the *Networking Installation Guide* (NTP 555-7001-213). This chapter also describes how to configure the appropriate port, if the port was not configured at software installation time.

Bix block cabling for peripheral devices

The following section outlines the BIX block designations and cabling for the peripheral devices. Cabling peripherals through the main distribution frame (MDF) is an alternative to using the 4- and 5-port fanout cables for any module, and is the normal method of cabling the alarm connections from module MM0 (see Figure 10-7).

To wire any of these three sets of connections to the MDF, install an NEA25B cable to the appropriate Meridian Mail I/O panel connector.

Table 10-4 lists tip, ring, pin, and pair color information for the ALM/MDM cable, and the equivalents of the 4- and 5-port fanout cables.

Alarms

Two Form-C dry contact relays are provided for connection to customer-provided alarms. Each relay contact is rated at 0.5 amps and 150 V DC. The major alarm contacts can be triggered by the MMP40 or 68K processor, a board reset, power off condition, or watchdog timeout (which has a fixed 128-second timeout interval).

Table 10-4
ALM/MDM and 4- and 5- port RS232 BIX block tip, ring, pin, and pair colors

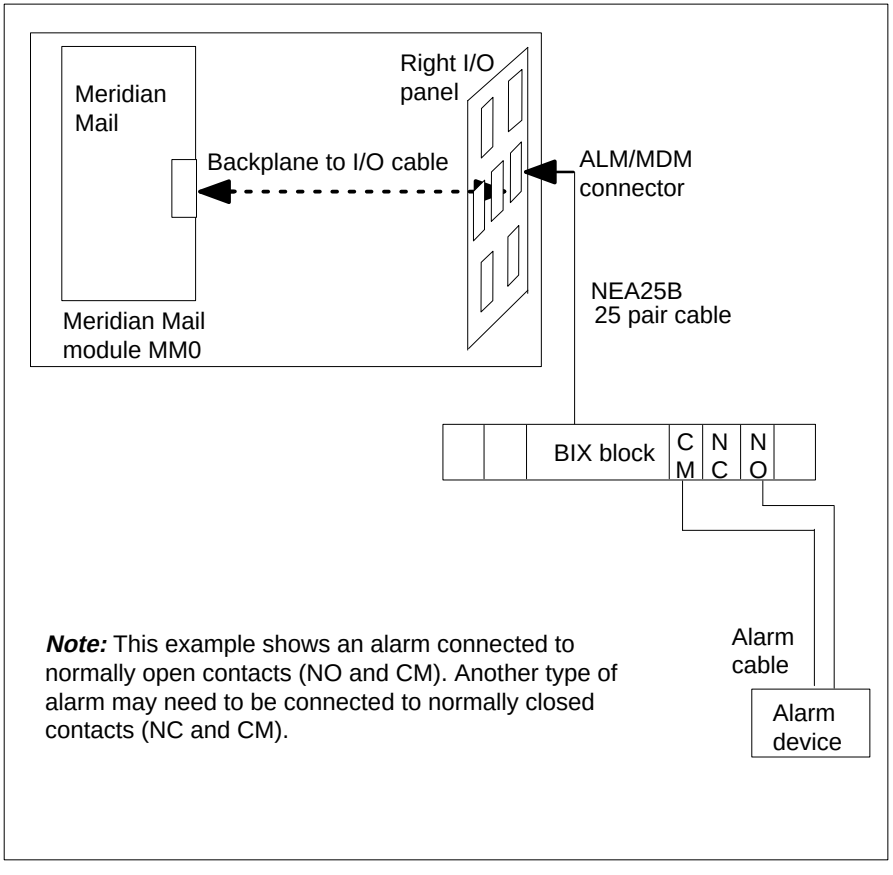
			Bix Label P0736930	Bix Label P0736931	
Pair	**Pin**	**Pair Color**	**Alarm & Modem**	**4-port RS232**	**5-port RS232**
1T	26	W-BL	T MDM	RXD Slot 4	RXD Slot 5
1R	1	BL-W	R MDM	GRD Port B	GRD Port 0
2T	27	W-O	FRM	CTS Slot 4	CTS Slot 5
2R	2	O-W	GRD	TXD Port B	TXD Port 0
3T	28	W-G	NC Minor	DSR Slot 4	DSR Slot 5
3R	3	G-W	CM Minor	RTS Port B	RTS Port 0
4T	29	W-BR	CM Crit	DCD Slot 4	DCD Slot 5
4R	4	BR-W	NO Minor	DTR Port B	DTR Port 0
5T	30	W-S	Power Monitor	RXC Slot 4	RXC Slot 5
5R	5	S-W	NC Crit	TXC Port B	TXC Port 0
6T	31	R-BL	NC Major	RXD Slot 7	RXD Slot 5
6R	6	BL-R	CM Major	GRD Port B	GRD Port 2
7T	32	R-O	NO Crit	CTS Slot 7	CTS Slot 5
7R	7	O-R	NO Major	TXD Port B	TXD Port 2
8T	33	R-G	Spare	DSR Slot 7	DSR Slot 5
8R	8	G-R	Spare	RTS Port B	RTS Port 2
9T	34	R-BR	Spare	DCD Slot 7	DCD Slot 5
9R	9	BR-R	Spare	DTR Port B	DTR Port 2
10T	35	R-S	Spare	RXC Slot 7	RXC Slot 5
10R	10	S-R	Spare	TXC Port B	TXC Port 2
11T	36	BK-BL	Spare	RXD Slot 4	RXD Slot 5
11R	11	BL-BK	Spare	GRD Port A	GRD Port 1
12T	37	BL-O	Spare	CTS Slot 4	CTS Slot 5
12R	12	O-BL	Spare	TXD Port A	TXD Port 1
13T	38	BK-G	Spare	DSR Slot 4	DSR Slot 5
13R	13	G-BK	Spare	RTS Port A	RTS Port 1

–continued–

Table 10-4 (continued)
ALM/MDM and 4- and 5- port RS232 BIX block tip, ring, pin, and pair colors

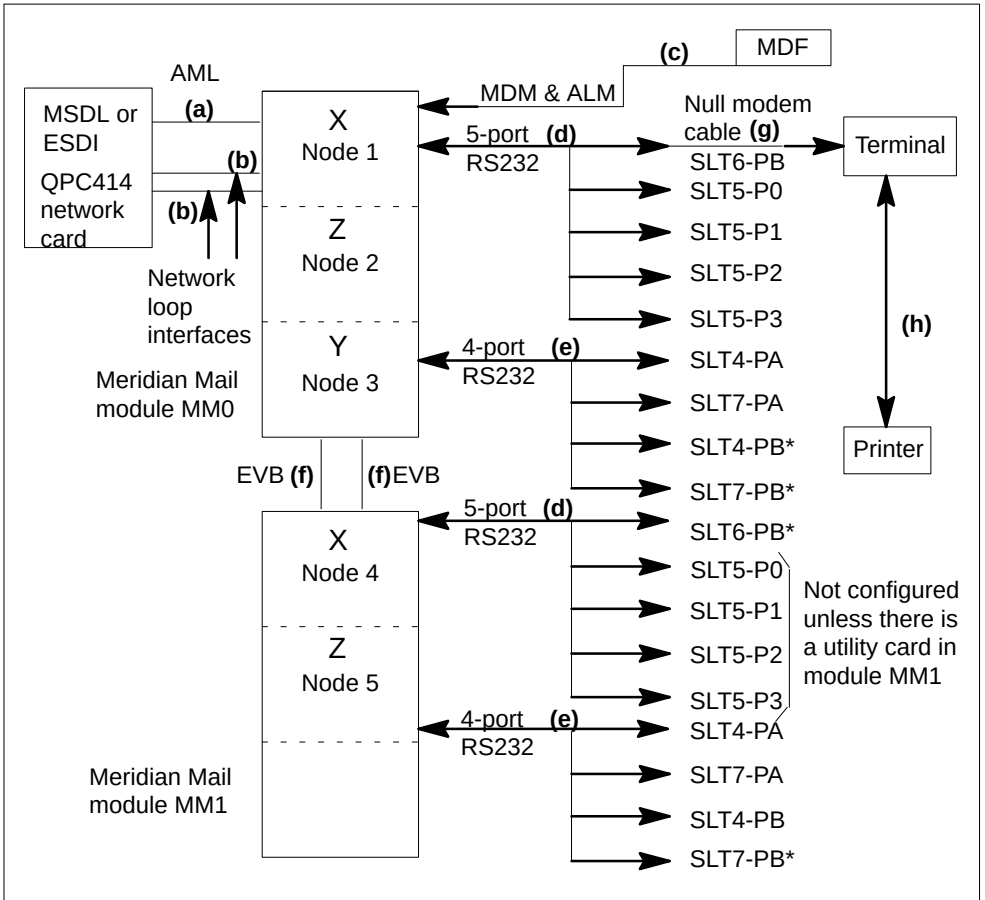
			Bix Label P0736930	Bix Label P0736931			
Pair	**Pin**	**Pair Color**	**Alarm & Modem**	**4-port RS232**		**5-port RS232**	
14T	39	BK-BR	Spare	DCD	Slot 4	DCD	Slot 5
14R	14	BR-BK	Spare	DTR	Port A	DTR	Port 1
15T	40	BK-S	Spare	RXC	Slot 4	RXC	Slot 5
15R	15	S-BK	Spare	TXC	Port A	TXC	Port 1
16T	41	Y-BL	Spare	RXD	Slot 7	RXD	Slot 5
16R	16	BL-Y	Spare	GRD	Port A	GRD	Port 3
17T	42	Y-O	Spare	CTS	Slot 7	CTS	Slot 5
17R	17	O-Y	Spare	TXD	Port A	TXD	Port 3
18T	43	Y-G	Spare	DSR	Slot 7	DSR	Slot 5
18R	18	G-Y	Spare	RTS	Port A	RTS	Port 3
19T	44	Y-BR	Spare	DCD	Slot 7	DCD	Slot 5
19R	19	BR-Y	Spare	DTR	Port A	DTR	Port 3
20T	45	Y-S	Spare	RXC	Slot 7	RXC	Slot 5
20R	20	S-Y	Spare	TXC	Port A	TXC	Port 3
21T	46	V-BL	Spare	TXCD	Slot 4	RXD	Slot 6
21R	21	BL-V	Spare	RI	Port A	GRD	Port B
22T	47	V-O	Spare	TXCD	Slot 7	CTS	Slot 6
22R	22	O-V	Spare	RI	Port A	TXD	Port B
23T	48	V-G	Spare			DSR	Slot 6
23R	23	G-V	Spare			RTS	Port B
24T	49	V-BR	Spare			DCD	Slot 6
24R	24	BR-V	Spare			DTR	Port B
25T	50	V-S	Spare			RXC	Slot 6
25R	25	S-V	Spare			TXC	Port B
–end–							

Figure 10-7
Connecting the alarm to the main distribution frame (MDF)



Note: This example shows an alarm connected to normally open contacts (NO and CM). Another type of alarm may need to be connected to normally closed contacts (NC and CM).

Figure 10-8
Ports for peripheral devices in an unshadowed system



(a) AML cable
(b) Network cable (network loop interface)
(c) Modem and alarm MDF cable
(d) 5-port RS232 fanout cable
(e) 4-port RS232 fanout cable
(f) External voice bus cable
(g) Null modem cable
(h) Printer cable

*Terminal may be connected for BootROM diagnostics during node expansion.

Table 10-5
Ports for peripheral devices in an unshadowed system

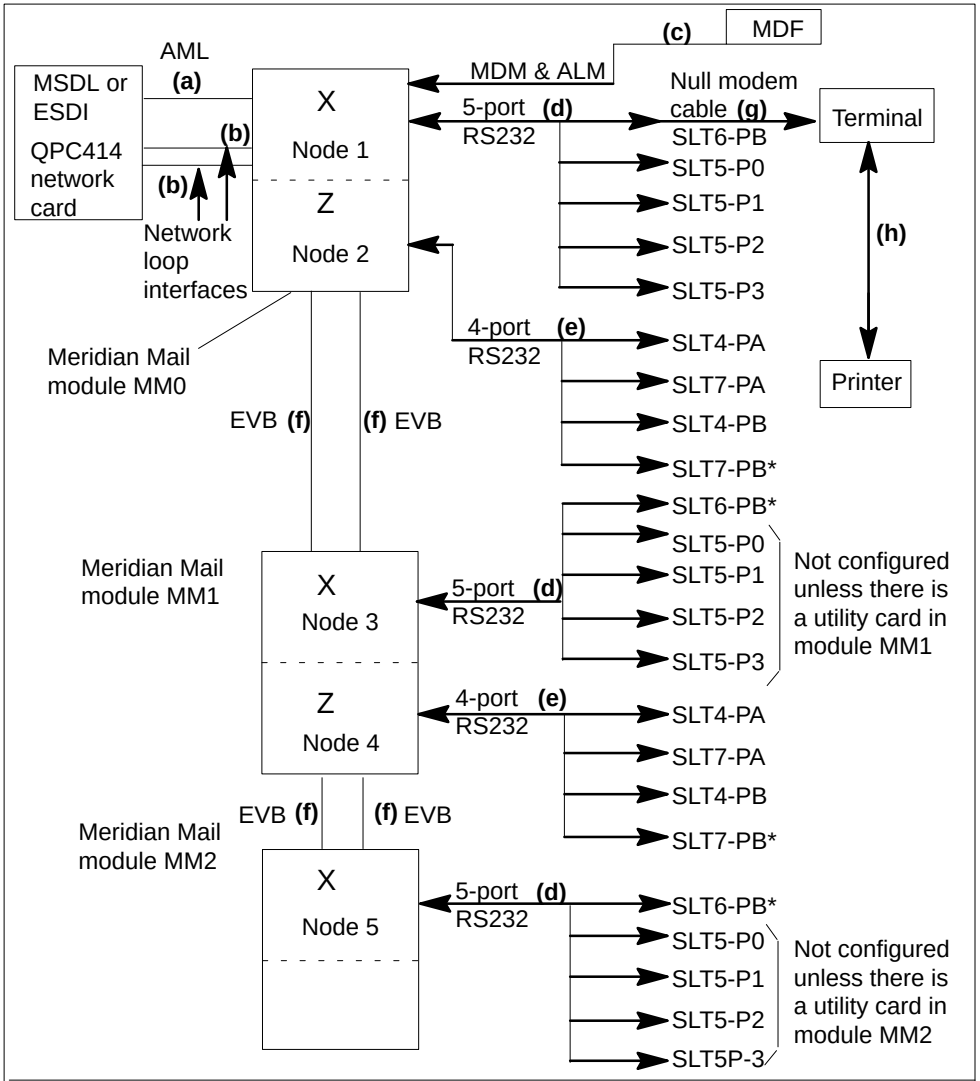
Module	Cable	Card slot	Connector	Dataport designation in software installation procedure	Hardware administration modify node screen
MM0	**CSL**	6 MMP40	**CSL**	Node 1 SBC* Card Port 2	Node 1 Card 7 Port 2
	5-port	6 MMP40	SLT6 PB	Node 1 SBC* Card Port 1	Node 1 Card 7 Port 1
		5 Util	SLT5 P0	Node 1 UTIL Card Port 1	Node 1 Card 6 Port 1
			SLT5 P1	Node 1 UTIL Card Port 2	Node 1 Card 6 Port 2
			SLT5 P2	Node 1 UTIL Card Port 3	Node 1 Card 6 Port 3
			SLT5 P3	Node 1 UTIL Card Port 4	Node 1 Card 6 Port 4
	4-port	7 (Z0) MMP40	SLT7 PB	Node 2 SBC* Card Port 1	Node 2 Card 1 Port 1
			SLT7 PA	Node 2 SBC* Card Port 2	Node 2 Card 1 Port 2
		4 MMP40	SLT4 PB	Node 3 SBC* Card Port 1	Node 3 Card 5 Port 1
			SLT4 PA	Node 3 SBC* Card Port 2	Node 3 Card 5 Port 2
MM1	5-port	6 MMP40	SLT6 PB	Node 4 SBC* Card Port 1	Node 4 Card 7 Port 1
		5 Util ports configured only if a UTIL card is installed	SLT5 P0	Node 4 UTIL Card Port 1	Node 4 Card 6 Port 1
			SLT5 P1	Node 4 UTIL Card Port 2	Node 4 Card 6 Port 2
			SLT5 P2	Node 4 UTIL Card Port 3	Node 4 Card 6 Port 3
			SLT5 P3	Node 4 UTIL Card Port 4	Node 4 Card 6 Port 4
	4-port	7 (Z0) MMP40	SLT7 PB	Node 5 SBC* Card Port 1	Node 5 Card 1 Port 1
			SLT7 PA	Node 5 SBC* Card Port 2	Node 5 Card 1 Port 2
			SLT4 PB	**not configured**	**not configured**
			SLT4 PA	**not configured**	**not configured**

Note 1: If you are converting an existing Meridian Mail EC system, the MMP40 card slot on the old hardware may be labeled “68K”.

Note 2: UTIL card ports are configured in module MM1 only if that module has a utility card installed.

* The dataport designation is: Node x MMP40 Card Port y

Figure 10-9
Ports for peripheral devices in a shadowed system



(a) AML cable
(b) Network cable (network loop interface)
(c) Modem and alarm MDM cable
(d) 5-port RS232 fanout cable
(e) 4-port RS232 fanout cable
(f) External voice bus cable
(g) Null modem cable
(h) Printer cable

*Terminal may be connected for MMP40 verification during node expansion.

Table 10-6
Ports for peripheral devices in a shadowed system

Module	Cable	Card slot	Connector	Dataport designation in software install proc.	Hardware administration modify node screen
MM0	**CSL**	6 MMP40	**CSL**	Node 1 SBC* Card Port 2	Node 1 Card 7 Port 2
	5-port	6 MMP40	SLT6 PB	Node 1 SBC* Card Port 1	Node 1 Card 7 Port 1
		5 Util	SLT5 P0	Node 1 UTIL Card Port 1	Node 1 Card 6 Port 1
			SLT5 P1	Node 1 UTIL Card Port 2	Node 1 Card 6 Port 2
			SLT5 P2	Node 1 UTIL Card Port 3	Node 1 Card 6 Port 3
			SLT5 P3	Node 1 UTIL Card Port 4	Node 1 Card 6 Port 4
	4-port	7 (Z0) MMP40	SLT7 PB	Node 2 SBC* Card Port 1	Node 2 Card 1 Port 1
			SLT7 PA	Node 2 SBC* Card Port 2	Node 2 Card 1 Port 2
		4 MMP40	SLT4 PB	**not configured**	**not configured**
			SLT4 PA	**not configured**	**not configured**
MM1	5-port	6 MMP40	SLT6 PB	Node 3 SBC* Card Port 1	Node 3 Card 7 Port 1
		5 Util ports configured only if a UTIL card is installed	SLT5 P0	Node 3 UTIL Card Port 1	Node 3 Card 6 Port 1
			SLT5 P1	Node 3 UTIL Card Port 2	Node 3 Card 6 Port 2
			SLT5 P2	Node 3 UTIL Card Port 3	Node 3 Card 6 Port 3
			SLT5 P3	Node 3 UTIL Card Port 4	Node 3 Card 6 Port 4
	4-port	7 (Z0) MMP40	SLT7 PB	Node 4 SBC* Card Port 1	Node 4 Card 1 Port 1
			SLT7 PA	Node 4 SBC* Card Port 2	Node 4 Card 1 Port 2
			SLT4 PB	**not configured**	**not configured**
			SLT4 PA	**not configured**	**not configured**
MM2	5-port	6 MMP40	SLT6 PB	Node 5 SBC* Card Port 1	Node 5 Card 7 Port 1
		5 Util ports configured only if a UTIL card is installed	SLT5 P0	Node 5 UTIL Card Port 1	Node 5 Card 6 Port 1
			SLT5 P1	Node 5 UTIL Card Port 2	Node 5 Card 6 Port 2
			SLT5 P2	Node 5 UTIL Card Port 3	Node 5 Card 6 Port 3
			SLT5 P3	Node 5 UTIL Card Port 4	Node 5 Card 6 Port 4
	4-port			**not configured**	**not configured**

Note: UTIL card ports are configured in module MM1 or MM2 only if a utility card is installed in that module.

* The dataport designation is: Node x MMP40 Card Port y

Chapter 11: Installing the Meridian Mail to PBX interface

The procedures described in this chapter show you how to install the two hardware interfaces that link Meridian Mail to the PBX. The two interfaces required between Meridian Mail and the Meridian 1 are

- a network loop for every 24 channels from Meridian Mail to the Meridian 1. For information on how to install the network card and the loop hardware refer to the section entitled “Establishing the network loop connection between Meridian Mail and the Meridian 1”.
- an AML data link from the Meridian Mail prime node to the Meridian 1. For information on how to install either the MSDL or ESDI card and the AML link cabling refer to the section entitled “Establishing the AML link between Meridian Mail and the Meridian 1”.

The Meridian 1 programming needed to support the network connection and the AML link(s) is discussed in the next chapter.

Reference documentation

You will need the following Meridian 1 documents:

- *Circuit Card Installation* (NTP 553-3001-211)
- *X11 Input/Output Guide* (NTP 553-3001-400)

Note: See *X11 System Management Applications* (NTP 553–3001-301) for information about Single Terminal Access.

Establishing the network loop connection between Meridian Mail and the Meridian 1

Meridian Mail can be used with any dedicated Meridian 1 network loop with TNs available for Meridian Mail usage. Each Meridian Mail port requires a TN. The VP4 or VP8 cards on the system can accommodate 4 and 8 TNs respectively.

> ***Note:*** Each VP4 represents a 112 CCS load and each VP8 represents a 224 CCS load.

The cables required, and their respective connections, for installation of the network loop are listed in Table 11-1 and shown in Figure 11-1. A diagram of the AML cabling between Meridian Mail and the Meridian 1 is shown in Figure 11-6.

Table 11-1
Meridian Mail to Meridian 1 network loop cabling

Figure reference	NT code	Cable	Routing information
11-2, cable a	QCAD124C (6ft.,1.8m.) QCAD124D (10ft.,3m.) QCAD124E (15ft.,4.6m.) QCAD124F (20ft.,6m.)	**Direct** network loop cables, non-shielded	From J4/LP0 and J5/LP1 on the backplane of module MM0 to the QPC414 network card on Meridian 1. If three network loop cables are required (more than 48 ports), the third will connect from J4/LP0 or J5/LP1 on module MM1 or MM2, whichever has the second utility card installed, to the second QPC414 network card. If four network loop cables are required (more than 72 ports), the fourth will connect from J4/LP0 or J5/LP1 on module MM1 or MM2 to the free connector on the module with the second utility card.
11-2, cable b	NT6P0122	**Indirect** network loop cable, backplane to I/O panel	From J4 and J5 on the backplane of the modules containing the utility cards to the I/O panels (LP0, right, and LP1, left, respectively).

–continued–

Table 11-1
Meridian Mail to Meridian 1 network loop cabling (continued)

Figure reference	NT code	Cable	Routing information
11-2, cable c	NT8D73AD (76in.,2.9m) NT8D73AF (12ft., 3.7m) NT8D73AL (20ft., 6.2m.) NT8D73AS (30ft. 9m.)	**Indirect** network loop cable, I/O panel to I/O panel, shielded	From Meridian Mail right I/O panel LP0 connector and left I/O panel LP1 connector to Meridian 1 module I/O panel which interfaces with the QPC414.
11-1, cable d	NT8D86AD	**Indirect** network loop cable, I/O panel to network card	Meridian 1 I/O panel to QPC414 network card.
–end–			

Installing the network loop

Procedure 11-1 describes how to install the network loop.

CAUTION
Risk of equipment damage
Wear a wrist strap connected either to the metal frame of the equipment or to the wrist strap frame connector while installing this equipment.

Before continuing, make sure you have all the hardware that is listed below on hand. Refer to Figure 11-1 for a diagram of the cabling.

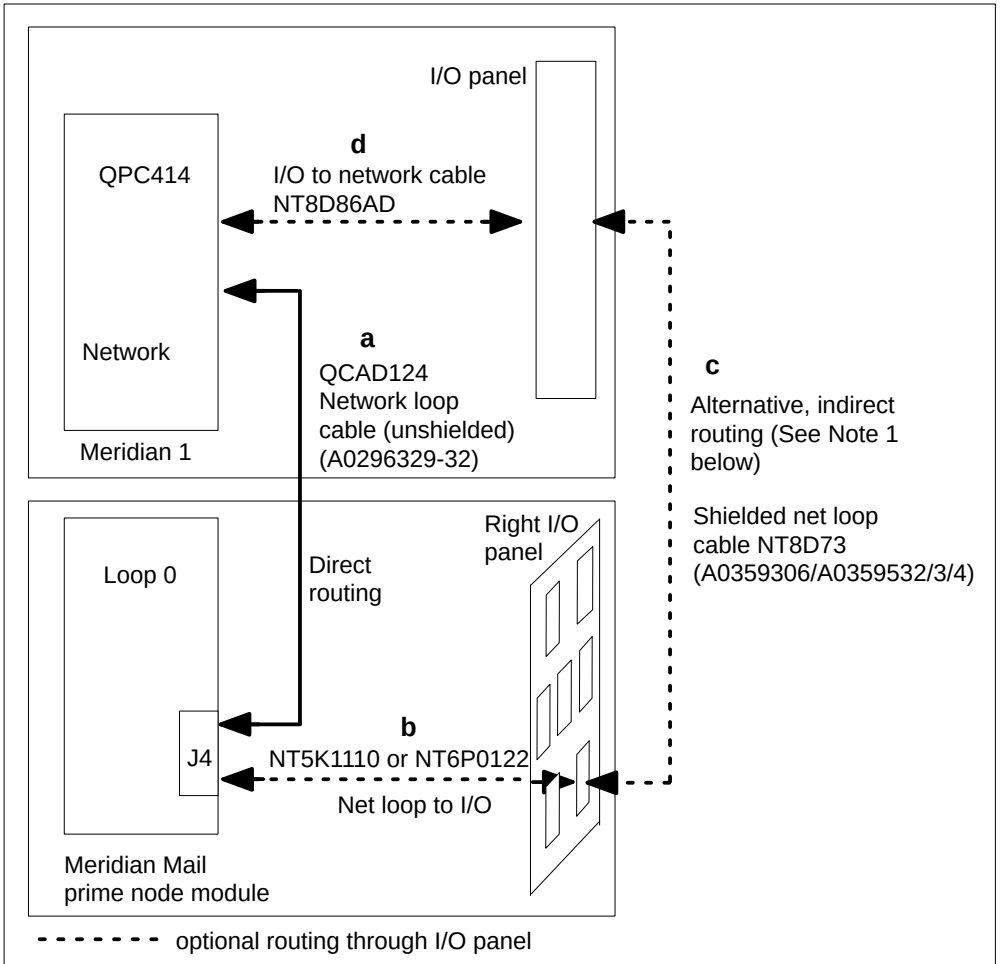
Direct routing from Meridian Mail backplane to QPC414

- QCAD124 (A0296329-32)

Indirect routing from Meridian Mail backplane to QPC414

- NT8D86AD network loop cable
- NT8D73 (A0359306/A0359532/3/4) shielded network cable
- NT5K1110 or NT6P0122 (preinstalled cable from Meridian Mail I/O panel to backplane)

Figure 11-1
Network loop cabling between Meridian Mail and Meridian 1



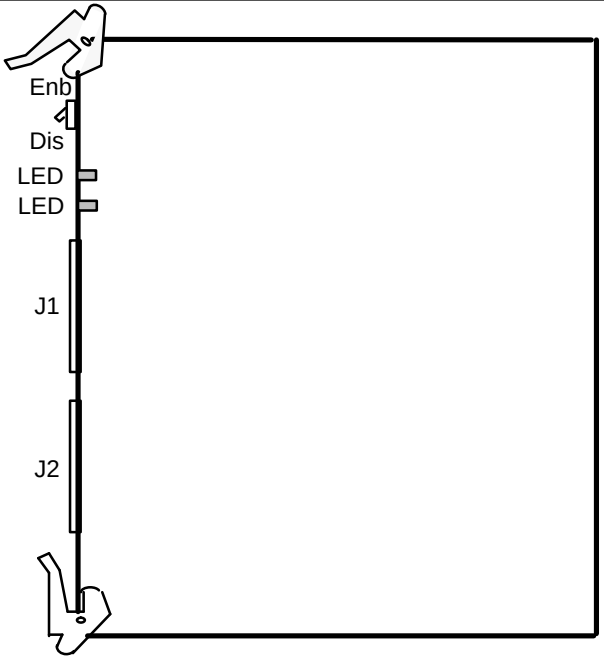
Note: 1 To minimize EMI, cables should stay within the module. Therefore, avoid the use of the alternative, indirect routing wherever possible.

Note: 2 This diagram depicts the alternative cabling through the right I/O panel to Loop 0, J4. The cabling could also be directed through the left I/O panel to Loop 1, J5.

Procedure 11-1
Installing the network loop hardware

1 Select an available slot, in the Meridian 1, to install the network card (QPC414). See *Circuit Card Installation* (NTP 553-3001-211).

Figure 11-2
Network loop card (QPC414)



Note: If the system has more than 48 channels, you will need to install a second network card.

2 Note the slot number and its corresponding loop number. Refer to *Circuit Card Installation* (NTP 553-3001-211) for information on how to identify the slot number and the corresponding loop number.

3 With the enable/disable switch set to disable, install the QPC414.

There are no other switches to set on this card. If you are unfamiliar with how to install circuit cards, refer to *Circuit Card Installation* (NTP 553-3001-211).

Once installed, both LEDs on the card will light.

Note: There are two options for Network loop cabling—direct or indirect—by way of the I/O panel. Depending on your equipment configuration, you many need one or more cables to connect the loop. For cabling routing information, refer to Figure 11-1.

4 Follow Procedure 11-2 if you are using direct cabling; otherwise follow Procedure 11-3 if you are using indirect cabling.

Procedure 11-2
Using direct cabling

Using Figure 11-1 as reference, follow the steps outlined below to install the Meridian Mail to PBX interface using direct cabling.

1 Install the direct loop cable QCAD124 at the Meridian 1 according to step a *or* b below, depending on the loop number selected in steps 1 and 2 of this procedure.

a. If the loop selected is an even number, install the cable in the top slot (J1) of the network card.

b. If the loop selected is an odd number, install the cable in the bottom slot (J2) of the network card.

2 If you have more than one network loop cable, connect the cables at the Meridian Mail as outlined in the following steps:

a. Connect the first network loop cable to J4 of the first module.

b. Connect the second network loop cable to J5 of the first module.

c. If the system has more than 48 channels, a third network loop cable and a second utility card are required. Connect the third loop to J4 of the module that contains the second utility card.

d. If the system has more than 72 channels, a fourth network loop cable is required. Connect this loop to J5 of the module that contains the second utility card.

e. Enter the loop numbers in the Meridian Mail configuration. Refer to the chapter on hardware administration in the *System Administration Guide* (NTP 555-7001-30x).

3 Set the switch on the faceplate of the QPC414 network card(s) to “enable”.

The LEDs will remain on.

Procedure 11-3
Using indirect cabling

Using Figure 11-1 as reference, follow the steps outlined below to install the Meridian Mail to PBX interface using direct cabling.

1 Install the I/O panel cable NT8D86AD according to step a *or* b below, depending on the loop number selected in steps 1 and 2 of this procedure.

a. If the loop selected is an even number, install the cable in the top slot, or J1, of the network card.

b. If the loop selected is an odd number, install the cable in the bottom slot, or J2, of the network card.

2 If they are not already installed, install the network loop cables as shown in Figure11-1 (cable b).

3 Connect the cable(s) NT8D73 between the I/O panels of the EC and Meridian 1.

4 If you have more than one network loop cable, connect the cables as outlined in the following steps:

a. Connect the first network loop cable to J4 of the first module.

b. Connect the second network loop cable to J5 of the first module.

c. If the system has more than 48 channels, an additional network loop cable and a second utility card are required. Connect the third loop to J4 of the module that contains the second utility card.

d. If the system has more than 72 channels, a fourth network loop cable is required. Connect this loop to J5 of the module that contains the second utility card.

e. Enter the Meridian 1 loop numbers in the Meridian Mail configuration. Refer to the chapter on hardware administration in the *System Administration Guide*.

5 Connect the I/O to I/O cables (NT8D73AD/F/L/S) from the LP0 and LP1 connectors on the Meridian Mail I/O panel to the Meridian 1 I/O panel.

6 Set the switch on the faceplate of the QPC414 network card(s) to "enable".

The LEDs will remain on.

Establishing the AML connection between Meridian Mail and the Meridian 1

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 manner, 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 AML (Applications Module Link), known also as the ISDN/AP link (Integrated Services Digital Network/Application Link) or the CSL (Command and Status Link). Without the AML, Meridian Mail does not have enough information to process the call correctly.

Hardware requirements

Establishing the AML data link involves installing the following hardware:

- MSDL card (NT6D80AA) or ESDI card (QPC513, version H or later) which occupies a slot in a common equipment module of the Meridian 1.
- cabling (NTND91AB) from the MSDL or ESDI card to the Meridian Mail backplane

and programming the link in the Meridian 1 software by modifying the configuration record in LD 17 (described in Chapter 12).

> ***Note:*** The MSDL and ESDI cards are both I/O cards that can serve as the interface between the Meridian 1 to Meridian Mail. However, the MSDL card can only be used with X11 software release 18 or later; whereas, the ESDI card can be used with any release of X11 software.

Software requirements

Three values must be selected in order to program the AML link, a device number (DNUM), applications module links (AMLs), and value added server identifiers (VSIDs). All three are selected in LD 17 of the Meridian 1 database in response to the three LD 17 prompts below:

- ADAN NEW AML x or ADAN NEW TTY x — link identifier assigned to the Meridian Mail AML link
- DNUM x — device number for the MSDL card or of a port on the ESDI card which allows Meridian Mail to identify the card.
- VSID x — Value Added Service ID associated with the AML link

However, before you can program the card, you need to know which device numbers, if any, have already been assigned to other devices. This is determined by reviewing the configuration record to see which numbers are already in use.

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 off 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.

Note: 1 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 Table 11-NO TAG.

Note: 2 Each AML must be associated with a VSID, but more than one AML can be associated with a single VSID.

Note: 3 *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.

Note: 4 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.

Note: 5 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 Table 11-NO TAG). 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. So 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, is going to be the same as the TTY number assigned.

Note: 6 The ESDI card is physically addressed by a switch block on the card (SW2).

Note: 7 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 which associates the ACD queue with the VSID.

Table 11-2
I/O card type, DNUM, AML, 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.					

Installing the multipurpose serial data link (MSDL) card

The MSDL card is a major improvement over previous I/O cards in that it has four physical port connections but requires only *one* device number (DNUM) from the system. Because all four ports on the card are associated with one device number, the MSDL occupies only 1 of the 16 allowed devices for Meridian 1 (unlike the ESDI which occupies 2).

Note: Meridian 1 cards are hot-pluggable. However, to remove or install a card, the card must be disabled in the software.

Procedure 11-4
Installing the MSDL card

1. Log on to the Meridian 1.
2. Load overlay 22 and print out the configuration record.
3. Enter the responses indicated in Table 11-3.

   Note: Only the prompts you need to respond to are shown. If you see a prompt not in the table, press <Enter> until the next prompt in the table appears.

   Table 11-3
   Overlay 22—printing existing Meridian 1 configuration

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	Configuration data block

4. Referring to the configuration record, select an available Device Number (DNUM), Application Module Link (AML number), and Value Added Server Identifier (VSID).

   The DNUMs are the same numbers 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. You will need them when configuring the link.

5. Unpack and inspect the MSDL card and check that there are no obviously loose or bent parts.
6. Set the switches on the card for the port you are going to use for the AML link according to the settings shown in Table 11-4.

Table 11-4
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

Figure 11-3 shows the MSDL and the location of the configuration switches on the card.

7 Set the S9 and S10 switches on the MSDL to the device number (DNUM) you chose in step 4. For example, if you chose device number 10, set S9 to1 and S10 to 0.

8 Disable the card, using the [Disable Node] softkey on the System Status screen. For more information on how to disable an I/O card, refer to the System Status and Maintenance chapter in your administration guide.

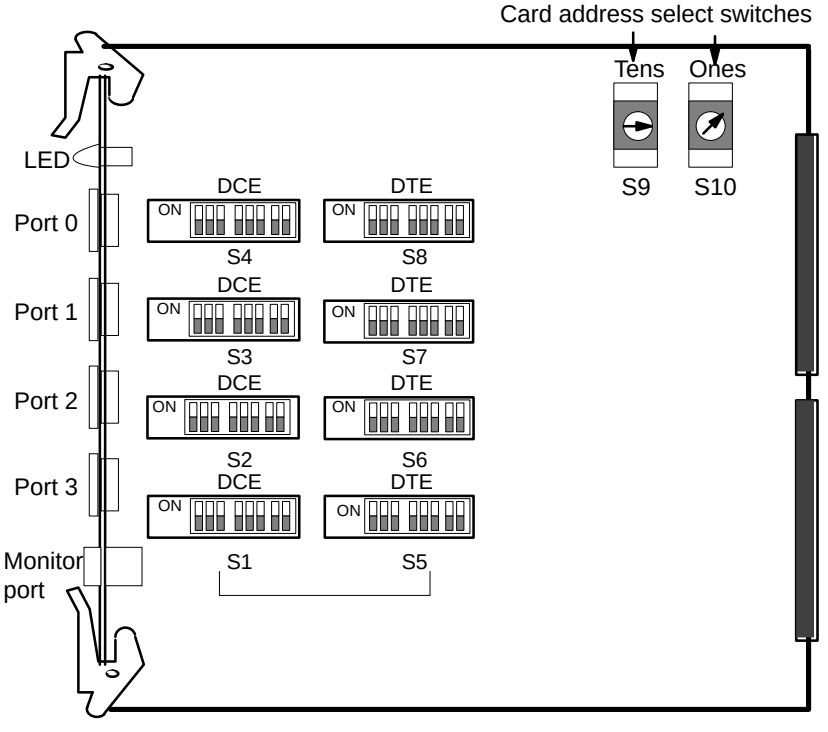
9 Install the card in the Meridian 1, in a loop (LP) slot on a common equipment (CE) shelf.

10 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 pattern, replace the card.

11 Enable the card, using the [Enable Node] softkey on the System Status screen. For more information on how to enable an I/O card, refer to the “System Status and Maintenance” chapter in your administration guide.

Figure 11-3
MSDL switch locations and example of switch settings



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

Installing the enhanced serial data interface (ESDI) card

Each 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 (DNUM) which is used to establish the software link with Meridian Mail. (This is explained in the chapter “Configuring the Meridian 1”.)

There are two important criteria to consider when determining and programming the DNUMs for the ESDI card:

- the two numbers must be consecutive
- the lower number must be even

DNUMs are selected on the ESDI card by setting SW2. The maximum possible number of devices on the Meridian 1 is 16. See Table 11-5.

Note: 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.

Table 11-5
Switch settings for device address (DNUM) on ESDI card (QPC513H or later)

Device address (DNUM pair) (set to ADAN prompt in Overlay 17)	Setting for SW2 (1=ON; 0=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

A vintage H ESDI card is required. Be sure to use the correct switch option settings required for this card.

Note: In the Meridian 1 documentation (*Circuit Card Installation* NTP 553-3001-211) this vintage of card is referred to as a “Style B” card.

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

Note: Meridian 1 cards are hot-pluggable. However, to remove or install a card, the card must first be disabled.

Procedure 11-5
Installing the ESDI card

1. Log on to the Meridian 1.
2. Load Overlay 22 and print out the configuration record. Refer to Table 11-6 for instructions.

Table 11-6
Overlay 22—printing existing Meridian 1 configuration

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	Configuration data block

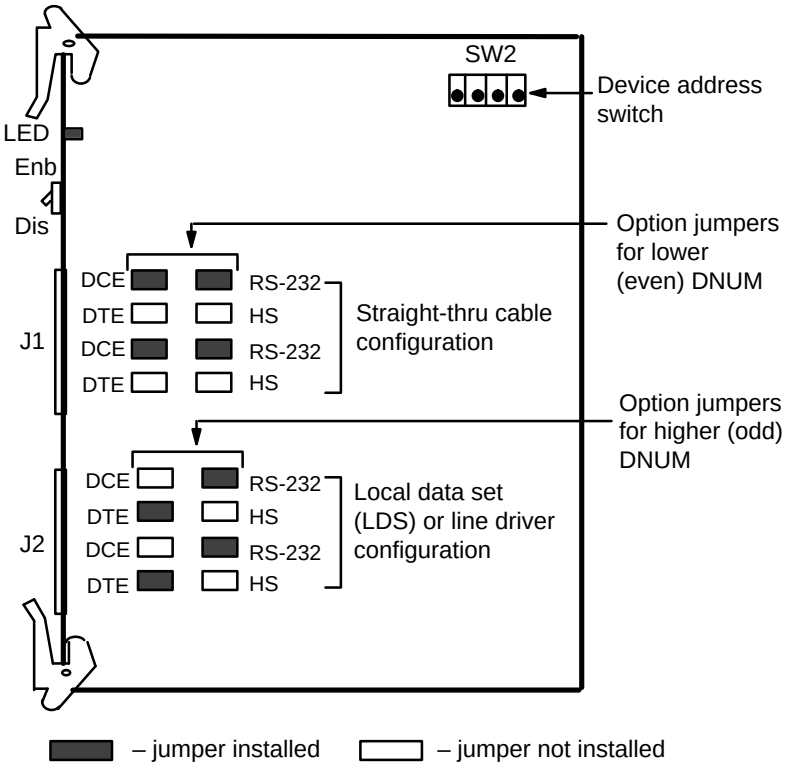
3. Referring to the configuration record, select an available device number (DNUM), Application Module Link (AML number), and Value Added Server Identifier (VSID).

   The DNUMs are the same numbers 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. You will need them when configuring the link and the ESDI.

4. Unpack and inspect the ESDI card and check that there are no obviously 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 Figure 11-4.
7. Remove the banks of jumpers and position the ESDI card as shown in Figure 11-4.

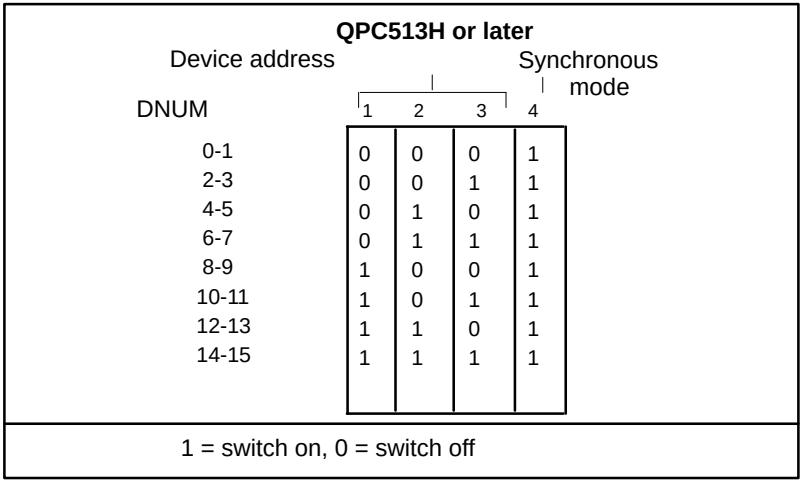
Figure 11-4
QPC513 ESDI card jumper settings



Note: This figure shows both J1 and J2 ports configured for Meridian Mail. The J1-port example shows the required setting when Meridian Mail is within 15.24 metres (50 feet) of the Meridian 1 switch. The J2-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.

8 Set the device address switches on the ESDI card according to Figure 11-5. This is the DNUM that you will use in Overlay 17.

Figure 11-5
QPC513 ESDI card device address switch (SW2) settings



9 Select a slot in the common equipment module of the Meridian 1 and install the ESDI circuit pack.

Refer to Circuit Card Installation (NTP 553-3001-211).

10 Set the ESDI faceplate switch to “ENB”.

Installing the AML link cabling

Procedure 11-6
Installing the AML link cable (indirect routing)

See Figure 11-6.

1 Connect the AML cable as described in either step a (for an MSDL card) or step b (for an ESDI card).

a. MSDL card: Connect one end of the MSDL cable **e** (NTND27AA or NTND27AB) to the assigned MSDL port (ports 0, 1, 2, or 3). Connect the other end to the I/O panel of the Meridian 1.

b. ESDI card: Connect one end of the ESDI cable **d** (P0695822) to J1 (for the lower, even DNUM) or J2 (for the higher, odd DNUM) of the QPC513. Connect the other end to the I/O panel of the Meridian 1.

2 Connect one end of the AML cable **c** (NTND91AA/AB) to the I/O panel of Meridian 1. Connect the other end to the CSL port on the right I/O panel of Meridian Mail.

3 Verify that the cable connections are secure on the cable **b** from J3 on the backplane of module MM0 to the right I/O panel, CSL port.

Procedure 11-7
Installing the AML link cable (direct routing)

1 If there is a cable from J3 on the backplane of module MM0 to the right I/O panel, CSL port, remove it.

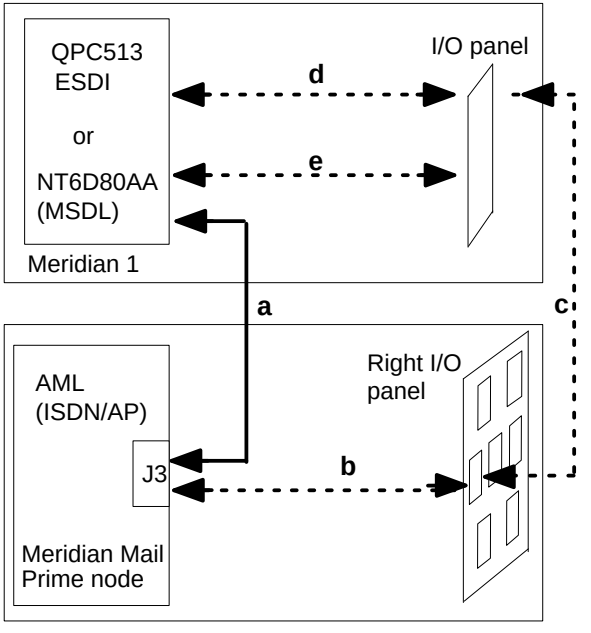
See Figure 11-6, cable **a**.

2 Connect the MSDL or ESDI cables from the card to the Meridian Mail as described below:

a. MSDL card: Connect one end of the MSDL cable (NTND27AA/AB) to the assigned MSDL port (ports 0, 1, 2, or 3). Connect the other end to J3 on the backplane of the Meridian Mail.

b. ESDI card: Connect one end of the (NTND91AA/AB) to J1 (for the lower, even DNUM) or J2 (for the higher, odd DNUM) of the QPC513. Connect the other end to J3 on the backplane of the Meridian Mail.

Figure 11-6
AML cabling between Meridian Mail and Meridian 1



Cables

Direct routing

a AML NTND91AA/AB
or NTND27AA/AB (shielded)

Indirect routing (alternative)

b AML to I/O (NT6D4410)

c AML (NTND91AA/AB)

d I/O to ESDI QPC513
(P0695822)
OR
e I/O to MSDL
(NTND27AA/AB)

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.

Chapter 12: Configuring the Meridian 1

This section describes the Meridian 1 configuration procedures necessary for Meridian Mail service. The following procedures should be performed in the order in which they are presented:

1 replacing the CPU ROM daughterboard on a single-CPU and on a dual-CPU Meridian 1

2 establishing the AML link between the Meridian 1 and Meridian Mail.

Note: The procedure for establishing the AML link is dependent on the I/O card type you have installed and the X11 software release you are using. When establishing the AML link, refer to one of the following sections for the I/O card type you have installed:

— Establishing the AML link using an ESDI card

— Establishing the AML link using a MSDL card

The section entitled, “Establishing the AML link using an ESDI card” provides generic and release-specific instructions for the ESDI card. You should follow the procedures which are applicable to the software release you are using.

3 defining the customer data block

4 defining the primary, and secondary, Meridian Mail ACD queues and voice services ACD queues

5 programming and verifying the network loop

6 adding ACD agents

7 setting call routing options for user phone sets

8 saving changes to the Meridian 1 configuration

Getting started

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 555-7061-200) for details.

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

- *X11 Input/Output Guide* (NTP 553-3001-400)
- *Circuit Pack Option Settings* (NTP 553-2201-211)
- *Circuit pack installation and testing* (NTP 553-3001-211)

Note 1: See NTP 553–3001-301, X11 System Management Applications, for information about Single Terminal Access.

Note 2: It is assumed that you are logged on to the Meridian 1 before you load any of the overlays.

In the 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 the CPU ROM daughterboard

To check the current ROM, load Overlay 22 and enter **ROM** in response to the prompt REQ.

The required ROM is one of the following:

- SL-1 ST (Release 12-14) QPC717
- SL-1 ST (Release 15 or later) QPC940
- SL-1 N QPC782
- SL-1 LE QPC573
- SL-1 XL QPC599
- SL-1 XN QPC600

- SL-1 XN (Memory Enhanced) QPC601
- SL-1 RT/NT/XT QPC602
- 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 connector and pins of the new daughterboard with the pins and connector on the CPU.

Single-CPU Meridian 1

Procedure 12-1
Replacing the CPU ROM daughterboard on a single-CPU Meridian 1

Service will be interrupted during this procedure since you need to power down the Meridian 1.

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.

Dual-CPU Meridian 1

Procedure 12-2
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.

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*.
7. Take the active CPU out of maintenance mode.
8. Use the **SCPU** command (Overlay 35) to switch CPUs.
9. Repeat steps 1 to 7 for the second CPU.
10. Exit from Overlay 35 by entering ********.

Establishing the AML link using an ESDI card

An ESDI card can be used in establishing the AML link between Meridian Mail and the Meridian 1 regardless of X11's software release. However, the commands used to program the link may vary depending on the software release.

Establishing the AML link involves the following procedures:

- Defining the ESDI and AML link
- Enabling the ESDI port (if using X11 release 17 or earlier)
- Activating the AML link (if using X11 release 18 or later)

To establish the AML link between the Meridian 1 and Meridian Mail, using a MSDL card, follow the steps outlined in the section entitled. "Establishing the AML link using an MSDL card" on page 12-11.

Defining the ESDI and AML link

Overlay 17 is used, regardless of X11's software release, to define the ESDI and AML link on the Meridian 1. However, the responses to the prompts will vary according to the software release.

Procedure 12-3
Configuring the ESDI and AML link

1. Enter **LD 17** to load Overlay program 17.

2 Enter the appropriate response to the prompt. Refer to Table 12-1 for link configuration for X11 software release 17 or earlier; refer to Table 12-2 for link configuration for X11 software release 18 or later.

3 Enter ******** to exit from Overlay program 17

Note: The shaded lines in Table 12-1 apply to NMS (Network Message Service systems) systems only.

Table 12-1
Overlay 17—ESDI and AML link configuration (X11 release 17 or earlier)

Prompts	Responses	Description
LCTL	YES	Modify link control parameters.
REQ	CHG	
TYPE	CFN	Configuration data block.
Note: The prompts in the shaded area below are applicable 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 (e.g., FDK if 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.
SYNC	YES	Synchronous mode required.
DUPX	FULL	Full duplex required.

–continued–

Table 12-1
Overlay 17—ESDI and AML link configuration (X11 release 17 or earlier) - continued

Prompts	Responses	Description
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 HDLC data link level).
T1	10	Retransmission timer (range 2-20 is in units of 0.5 s; e.g., 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 on to next prompt.
VAS	NEW or CHG	Define AML link 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 on to next prompt.
CMS	xx (range is 0-15)	Must be the same number as the ESDI device address (DNWM).
CONF	DIR	Link configuration is DIR.
CMS	<cr>	Go on to next prompt.
BPS	9600	AML link data rate.
CLOK	EXT	External clocking arrangement.

–continued–

Table 12-1
Overlay 17—ESDI and AML link configuration (X11 release 17 or earlier) - continued

Prompts	Responses	Description
CSQI	20 *	Max. no. of call registers for input queues (twice the number of voice ports).
CSQO	20 *	Max. no. of call registers for output queues (twice the number of voice ports).
	CR	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.		
–end–		

Table 12-2
Overlay 17—ESDI and AML link configuration (X11 release 18 or later)

Prompts	Responses	Description
REQ	CHG	Change
TYPE	CFN	Configuration data block
ADAN	NEW AML xx (range is 0–15)	The response “NEW AML xx” creates an AML link with a link number xx. The link number can be any number from 0 to 15. The link number must match the physical address switch on the card (DNUM).
CTYP	MSDL or ESDI	Card type
DNUM	0-15	Device number for the AML port. Use the same number that you used for the AML link number. This will make it easier to remember both numbers. The device number must match the physical address switch on the card.
PORT	x	(MSDL only) Port number in the range 0 to 3
DES	aaa...a	AML port designation. This can be any alphanumeric string up to 16 characters: 0-9 and A-Z (upper case only) are allowed. Characters * and # are not allowed.
BPS	9600	Baud rate.
PARM	(R232 DCE)	(MSDL only) Interface and transmission mode
CLOK	EXT	Internal or external clock. Source of primary clock is either internal or external. (ESDI only)
IADR	(3)	Individual Address for the data-link HDLC protocol. The IADR and RADR prompts must be co-ordinated with the far-end. If IADR is defined as 3, then RADR must be 1. Default is 1 prior to release 18.

–continued–

Table 12-3
Overlay 17—ESDI and AML link configuration (X11 release 18 or later) – continued

Prompts	Responses	Description
RADR	(1)	Remote address for the data-link level HDLC protocol. The IADR and RADR prompts must be co-ordinated with the far-end. If IADR is defined as 3, then RADR 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 seconds.
T2	10	Maximum time allowed without a frame being exchanged.
T3	40	Timer for initial link setup in units of 0.5 seconds.
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.
LTHR	NO	Default link performance thresholds (ESDI only).
ADAN	<CR>	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 link number.
DLOP	<CR>	
AML	0-15	AML link number.
CONF	DIR	Direct CSL configuration
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.
		–end–

Enabling the ESDI port or activating the AML link

The link diagnostic program, Overlay 48 (NTP 553-3001-400 Release 18) is used to enable the ESDI port (if running X11 software release 17 or earlier) or to activate the AML link (if running X11 software release 18 or later). If you are using an ESDI card and running X11 software release 17 or earlier, follow procedure 12-4 to enable the ESDI port; otherwise follow procedure 12-5 if you are using an ESDI card and running X11 software release 18 or later.

If you are using an MSDL card and running X11 software release 18 or later, follow procedure 12-6.

Procedure 12-4
Enabling ESDI ports (ESDI, X11 Release 17 or earlier)

1. Enter **LD 48** to load Overlay program 48.For more information refer to NTP 553-3001-400, X11 Release 18.
2. Enter **ACMS *n*** to initiate the Auto Setup sequence and establish a link.
3. Enter ******** to exit from Overlay program 48.

Procedure 12-5
Activating the AML link (ESDI, X11 Release 18 or later)

1. Enter **LD 48** to load Overlay 48.

   Note: The bold and italicized n (***n***) in the commands below, represents a variable. Substitute the AML link number instead.
2. Enter **ENL AML *n* ACMS** to initiate the Auto Setup sequence and establish the link.
3. 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 will issue the following SEER (System Event/Error Report) when the link is up:

- 25-05 CSL P Link is up

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

Establishing the AML link using a MSDL card

An MSDL card can be used in establishing the AML link between Meridian Mail and the Meridian 1 if X11's software release is 18 or greater. To establish the AML link between the Meridian 1 and Meridian Mail, follow the steps outlined in this section.

- Defining the MSDL and AML link
- Activating the AML link

To establish the AML link between the Meridian 1 and Meridian Mail, using an ESDI card, follow the steps outlined in the section entitled. "Establishing the AML link using an ESDI card" on page 12-4.

Defining the MSDL and AML link

Use Overlay 17 to define the MSDL and AML link on the Meridian 1. Refer to Table 12-3 for link configuration.

Table 12-3
Overlay 17—MSDL and AML link configuration

Prompts	Responses	Description
REQ	CHG	Change
TYPE	CFN	Configuration data block
ADAN	NEW AML xx (range is 0–15)	The response "NEW AML xx" creates an AML link with a link number xx. The link number can be any number from 0 to 15. The link number must match the physical address switch on the card (DNUM).
CTYP	MSDL or ESDI	Card type
DNUM	0-15	Device number for the AML port. Use the same number that you used for the AML link number. This will make it easier to remember both numbers. The device number must match the physical address switch on the card.
PORT	x	(MSDL only) Port number in the range 0 to 3
–continued–		

Table 12-3
Overlay 17—MSDL and AML link configuration – continued

Prompts	Responses	Description
DES	aaa...a	AML port designation. This can be any alphanumeric string up to 16 characters: 0-9 and A-Z (upper case only) are allowed. Characters * and # are not allowed.
BPS	9600	Baud rate.
PARM	(R232 DCE)	(MSDL only) Interface and transmission mode
CLOK	EXT	Internal or external clock. Source of primary clock is either internal or external. (ESDI only)
IADR	(3)	Individual Address for the data-link HDLC protocol. The IADR and RADR prompts must be co-ordinated with the far-end. If IADR is defined as 3, then RADR must be 1. Default is 1 prior to release 18.
RADR	(1)	Remote address for the data-link level HDLC protocol. The IADR and RADR prompts must be co-ordinated with the far-end. If IADR is defined as 3, then RADR 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 seconds.
T2	10	Maximum time allowed without a frame being exchanged.
T3	40	Timer for initial link setup in units of 0.5 seconds.
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.

–continued–

Table 12-3
Overlay 17—MSDL and AML link configuration – continued

Prompts	Responses	Description
LTHR	NO	Default link performance thresholds (ESDI only).
ADAN	<CR>	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 link number.
DLOP	<CR>	
AML	0-15	AML link number.
CONF	DIR	Direct CSL configuration
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.
–end–		

Activating the AML link (MSDL card, X11 Release 18 or later)

Use the link diagnostic program, Overlay 48 (NTP 553-3001-400 Release 18), to enable the AML port on the MSDL card. If you are using an ESDI card and running X11 software release 18 or later, follow procedure 12-5 to activate the AML link

Procedure 12-6
Activating the AML link (MSDL card, X11 Release 18 or later)

1 Enter **LD 48** to load Overlay 48.

Note: The bold and italicized n (***n***) in the commands below, represents a variable. Substitute the appropriate information.

2 Enter **ENL MSDL *n*** (where n is the DNUM) to enable the card.

3 Enter **ENL AML *n* AUTO** (where n is the AML link number) to initiate the Auto Setup sequence and establish the link.

4 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 will issue the following SEER (System Event/Error Report) when the link is up:

- 25-05 CSL P Link is up

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

Defining Meridian Mail in the customer data block

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 555-7061-200) available for reference.

Two sets of prompts in Overlay 15 affect the routing of unanswered or busy calls

- Flexible Call Forward (FNAD/FNAL/FNAN) 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.

Procedure 12-7
Defining Meridian Mail in the customer data block

1. Load Overlay 15 at the Meridian 1 administration terminal.
2. Respond to the prompts as shown in Table 12-4.
3. When configuration is complete, enter ******** or type **END** followed by <Return> in response to the prompt REQ.

Table 12-4
Overlay 15—Customer data block

Prompts	Responses	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 0 (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	YES	The CFNA prompt appears only if you respond YES to this prompt.
CFNA	____	Number of ring cycles before the call is forwarded. 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	YES (NO)	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.

–continued–

Table 12-4
Overlay 15—Customer data block (continued)

Prompts	Responses	Description
MATT	YES (NO)	Set to YES, unless NMS (Network Message Service) has been purchased. ***Note***: for MDID, NDID, and MWFB, see Quick Reference Guide .
EEST	NO	Originating party does not receive DTMF feedback. Remote Meridian 1 sites should also be set to NO.
Note: The prompts in the shaded area below are applicable 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 only appears for 5 or 6-digit dialing plans.
	CR	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

–end–

Configuring the trunk route data block (NMS only)

This procedure shows 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).

Procedure 12-8
Configuring route data block

1. Load Overlay 16 at the Meridian 1 administration terminal.
2. Respond to the prompts as shown in Table 12-5.
3. When configuration is complete, reply **END** to the prompt REQ.

Table 12-5
Overlay 16—Route data block parameters

Prompts	Responses	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.
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Defining Meridian Mail primary ACD queues

A separate primary queue must be configured for each port type: Basic voice, Full Service voice, and Multimedia. This procedure shows how to configure the ACD groups for each queue. See "Configuring Voice Services" in the *System Administration Guide* for detailed instructions on configuring the Voice Services queues.

Procedure 12-9
Defining the primary Meridian Mail ACD queues

1. Load Overlay 23 at the Meridian 1 administration terminal.
2. Respond to the prompts as shown in Table 12-6 to add a primary queue.
3. Press <Return> for each prompt that appears after NCFW.
4. When the REQ prompt appears, enter **NEW** to add another voice service primary queue.
5. Repeat steps 2 to 4 for each primary queue you want to configure.
6. When the primary ACD queues have been configured, enter **END** followed by <Return> at the next REQ prompt to exit the overlay**.**

Table 12-6
Overlay 23—Voice Messaging ACD parameters

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block.
CUST		Meridian 1 customer number.
ACDN	____	Enter the main DN for the voice service. This number should be the same as the DN specified for the service 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.

–continued–

Table 12-6
Overlay 23—Voice Messaging ACD parameters – continued

Prompts	Responses	Description
MAXP	____	Maximum number of ACD agents for the appropriate primary queue. This should be equal to or greater than the number of voice channels allocated to the service.
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.
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.
		–end–

Defining Meridian Mail secondary ACD queues

Separate secondary ACD queues must be defined for each primary ACD queue which has been established. This procedure shows 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.

Procedure 12-10
Defining Voice Services ACD queues

1. Load Overlay 23 at the Meridian 1 administration terminal.
2. Respond to the prompts as shown in Table 12-7.
3. Press <Return> for each prompt that appears after NCFW.
4. Repeat steps 1 to 3 for each agent that you want to add.

Table 12-7
Overlay 23—Voice service and satellite site ACD parameters

Prompts	Responses	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 main DN for the primary queue for the selected service. (If this is an NMS satellite site, use network format.)
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Meridian Mail numbering requirements are slightly different when the Guest Voice Messaging option is installed. Refer to the *System Administration Guide* for details.

Programming the network loop

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

Procedure 12-11
Programming the network loop

1 Load Overlay 22 and print out the configuration record. Refer to Table 12-8. By reading the configuration record, select a loop that is not already reserved.

Note: Meridian Mail EC supports only double density loops.

The maximum number of channels per loop is 24. The Utility card supports a maximum of 48 channels. Meridian Mail can have up to 96 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 section "Common Equipment, 'CEQU'".
3. Program the Meridian Mail loop by responding to the prompts shown in Table 12-8.
4. Print out the configuration record to verify your programming.

   Your configuration record will be similar to the example in Table 12-9. In this case, Loop 34 could be supporting Meridian Mail.

Table 12-8
Overlay 17 – Configuring the network loop

Prompts	Responses	Description
REQ	CHG	Change
TYPE	CFN	Configuration data block
	(CR)	<Return>
CEQU	YES	This prompt is the gate-opener for configuring common equipment parameters.
	(CR)	<Return>
TERQ	0-159	Enter the loop number you selected for Meridian Mail. TERQ means a double density local terminal loop, the only type of loop supported on the EC.
	CR	<Return> until all prompts are finished and your entry is updated.

Table 12-9
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

Procedure 12-12
Verifying the network loop

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 extinguish. This indicates that the loop is enabled.

2. Load Program 30 to verify the status (STAT) and test (LOOP) the network loop of *'x'* (where *'x'* represents the particular loop being tested). Follow the acceptance testing procedure listed in the *Circuit Card Installation* (NTP 553-3001-211).

3. If you receive an error message, refer to the *X11 Input/Output* document to troubleshoot and correct the problem.

   If you receive an "OK", the loop connection is successfully established.

Adding ACD agents

There must be one ACD agent for each Meridian Mail voice processor channel. The ACD agents are defined as Meridian 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 1: It is useful to have the AML disabled when adding agents. If you leave it enabled, the service changes will take much longer to perform.

To disable the link, use the Overlay 48 command

— DIS ESDI n (X11 Release 17 or earlier) or

— DIS AML m LYR2 (X11 Release 18 or later)

where n *is the ESDI port number and* m *is the AML number.*

Note 2: If an LD44 audit program is running, VAS002 and SCH3484 error messages may appear on the Meridian 1 console. Ignore them.

Note 3: 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 "System status and maintenance" chapter of the *System Administration Guide,* to change DNs. To modify TNs, refer to "Node configuration" section in the "Modify hardware" chapter of *System Administration Tools* (NTP 555-7001-305).

Note 4: ACD agents are hard-coded to accept shelves 0 and 1, and card slots 2 and 3, for TN assignments only. The maximum number of agents per loop on Meridian Mail is 24.

Note 5: The Modular Option EC supports only double density loops.

Procedure 12-13
Adding ACD agents

1. To begin adding ACD agents, load Overlay 11.
2. Respond to the prompts (as shown in Table 12-10) for the first agent.
3. Repeat step 2 for each ACD agent.
4. When all agents have been added, reply ******** to the prompt REQ.

Table 12-10
Overlay 11—ACD agents

Prompts	Responses	Description
REQ	NEW	
TYPE	SL1	
TN	ll s cc u	Enter an ACD agent TN. Ranges: Double Density Loop = 0-159 Shelf = 0-1 Card = 2-3 Unit = 0-7 (for DD)
CDEN	DD	ACD agents must be on double density line card.
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.

–continued–

Table 12-10
Overlay 11—ACD agents

Prompts	Responses	Description
KEY	0 ACD xxxxxxx 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.
KEY	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 the *System Administration Guide*.
KEY	2 MSB	Define key 2 as a Make Set Busy key.
KEY	3 NRD	Define key 3 as a Not Ready key.
KEY	6 TRN	Define key 6 as a Transfer key.
KEY	7 AO3 (letter 'O')	Define key 7 as a Conference key.
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.
		–end–

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.
3800 and 3801 are the agent position DNs, and must be unique.
2800 and 2801 are the secondary ACD queue DNs, and are put in the CAT.

Setting call routing options for user telephone sets

Set call routing options for each user's set as shown in Overlay 10 (Table 12-11) for 2500 sets and Overlay 11 (Table 12-12) for Meridian 1 sets.

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, Table 12-11) and FDN (Overlay 11, Table 12-12). 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 11).
  - — The Call Waiting feature is enabled for the user in two forms: Call Waiting (applies to incoming trunk calls) and 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 lamp, or an audible indication (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).

Table 12-11
Overlay 10—2500 set data

Prompts	Responses	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	3-party call conferencing feature
	FBA (FBD)	Call forward busy allowed (denied).
	LPA (LPD)	Message-waiting lamp is equipped (not equipped). If a lamp is not equipped, users are notified by interrupted dial tone.
	DTN	Digitone class of service
FTR	FDN HTA	Hunting allowed.
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 <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Table 12-12
Overlay 11—Meridian 1 set data

Prompts	Responses	Description
REQ	NEW, CHG	
TYPE	____	Type of set (e.g., 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	Hunt allowed.
	MWA	Message waiting allowed.
	FNA	Call forward no answer allowed.
	FBA (FBD)	Call forward busy 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/lamp, where yyyy is the Meridian Mail DN. For phone 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.
KEY	1-9 AO3	Add a 3-party conference key. This is necessary for some basic Meridian Mail features.
KEY	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 <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Saving Meridian 1 changes

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

Procedure 12-14
Saving changes to Meridian 1 configuration

1. Load Overlay 43.
2. At the next "." prompt, enter **EDD** to start dumping the data to disk.

   The system displays all the data being saved.

   The following message appears:
   RECORD COUNT=xxxx
   DATADUMP COMPLETE
3. Return to step 2 and repeat this step two more times, each time using a new diskette.

   Note: Do NOT remove the diskette while the LED is lit. As long as the LED is on, the diskette is still being written to.
4. Enter ******** to exit from Overlay 43. (The **END** command does not work in this case.)
5. Enter **LOGO** to logout.

Chapter 13: Starting up and configuring Meridian Mail

Meridian Mail software has already been installed on the system. Software tapes (Install/data tapes) are included with the system to allow you to reinstall Meridian Mail, in case of problems, and to allow you to perform hardware modifications and other specialized functions. Do not load software from the tapes unless specifically instructed to do so.

Note: See *X11 System Management Applications* (NTP 553–3001-301) for information about Single Terminal Access.

Starting up Meridian Mail

Procedure 13-1
Starting up Meridian Mail

Note: If any problems occur during startup, see Chapter 17 "Troubleshooting startup problems."

1. Power on the administration terminal, printer, and other peripheral devices.
2. On the administration terminal, press <Ctrl> and <Print Screen> at the same time to turn on automatic printing. Note that the <Print Screen> key may be labelled differently on your keyboard.

   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 capture a printout of the bootup messages when you power on the Meridian Mail system. The bootup messages that should appear are outlined in the "Troubleshooting startup problems" chapter. If you encounter a problem starting up the Meridian Mail system, you can compare the bootup messages that appeared on your system to the proper messages described in the "Troubleshooting startup problems" chapter.

3 Before you power up the Meridian Mail system, look at Table 13-1 and be prepared to verify the proper behavior of the LEDs visible at the front of each module.Be prepared to observe the hexadecimal display on the front of the MMP40 card (see Figure 13-1).

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.

If this system has more than one Meridian Mail module, power on module MM0, followed by module MM1, followed by module MM2.

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.

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

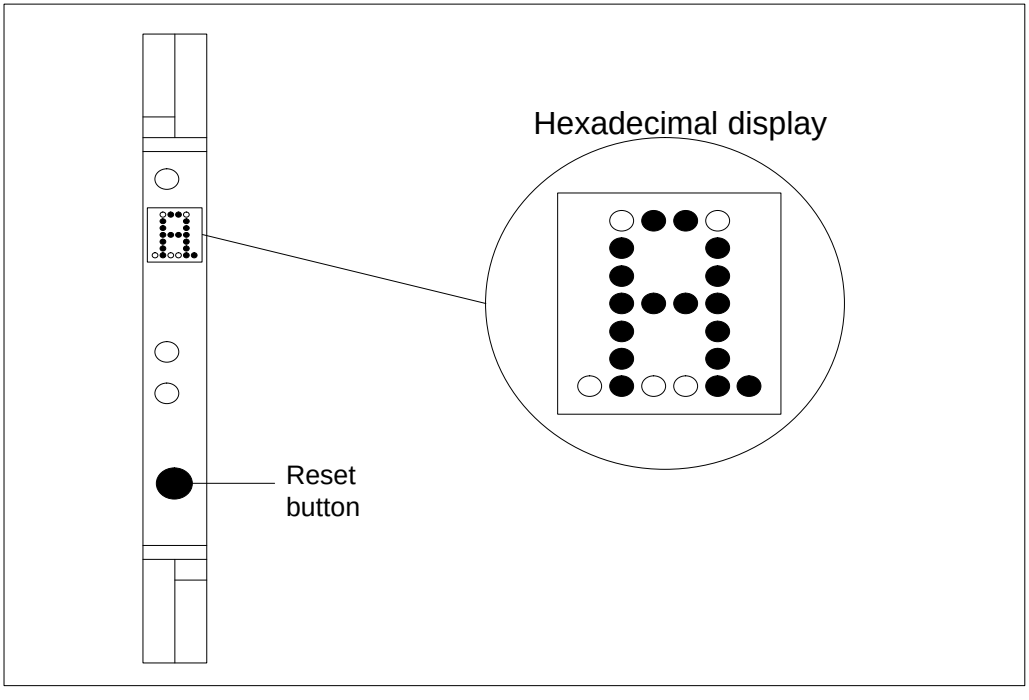
5 Check for power problems:

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. If these LEDs do not behave as described, consult the "Troubleshooting startup problems" chapter.

Table 13-1
Starting up Meridian Mail—behavior of LED indicators

Location of LED	Color	Behavior
Power supplies	Green	On while power switch (DC) or shelf breaker (AC) is ON.
VP	Green	On while power to node is ON.
MMP40 (hexadecimal display)	Red	Always on while power to node is on. Can display numbers 0 to 9 or letters A to F (representing a hexadecimal number), plus a dot to the left and/or right of the letter or number.

Figure 13-1
Hexadecimal display on MMP40 card



ATTENTION
Reduce system stress
To reduce stress on the system, use the RESET button on the faceplate of the 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.

6 Check the hard copy of the bootup messages. If the word “FAILED” appears beside any diagnostic message, refer to the “Troubleshooting startup problems” chapter for troubleshooting procedures.

7 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.

8 Check the terminal display by typing <Ctrl><w>.

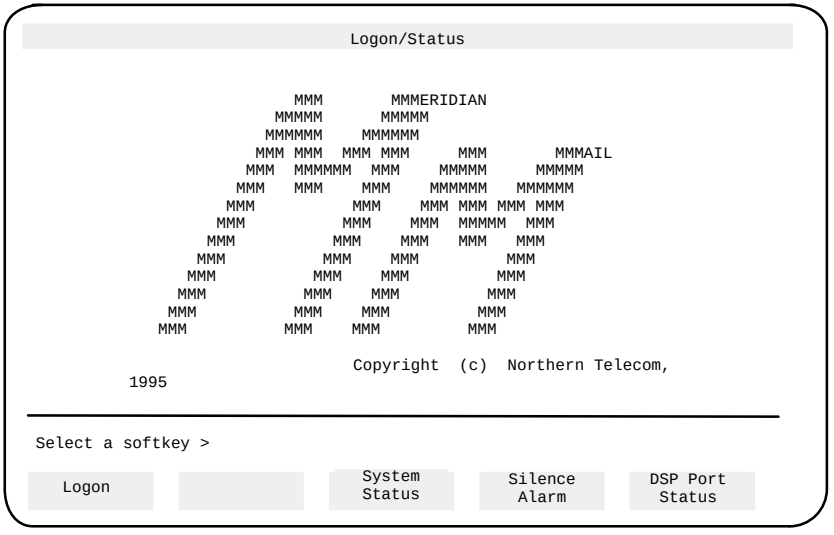
a. If information appears in a box with straight lines, close the window by pressing <s>.

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

9 Perform the software installation, as outlined in ”Software Installation” in the *System Installation and Modification Guide* (NTP 555-7001-215).

10 When all diagnostics have completed and all software has been loaded, the Meridian Mail Logon screen should appear on the administration terminal (see Figure 13-2), and the hexadecimal display on the MMP40 cards should read “A.” with the dot blinking.

Figure 13-2
The Logon screen



11 Check the system status to make sure the channels are functional and all links are up.

a. Press the [System Status] softkey.

Node status should be InService for all nodes, and DSP port status should be Idle for all voice ports. Prior to reaching the InService state, the node status and port status go through a Loading state while the software is being loaded. See Figure 13-3 for an example of the System Status screen.

Note: For a full description of this screen, see the *System Administration Guide*.

If you power the system up without the network loops connected, the diagnostics will run and the software will load, but the channels will time out and fail, and error messages will appear.

Figure 13-3
System Status screen

```
                                    System Status

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
```

12 If the total number of ports for each node is incorrect, refer to the "Modify hardware" chapter in *System Administration Tools* (NTP 555-7001-305).

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

Configuring Meridian Mail

To configure Meridian Mail, follow procedure 13-2 when the Logon screen appears on the administration terminal.

Procedure 13-2
Configuring Meridian Mail

Note: You may need *System Administration Tools* (NTP 555-7001-305) and the *System Administration Guide* to complete this procedure.

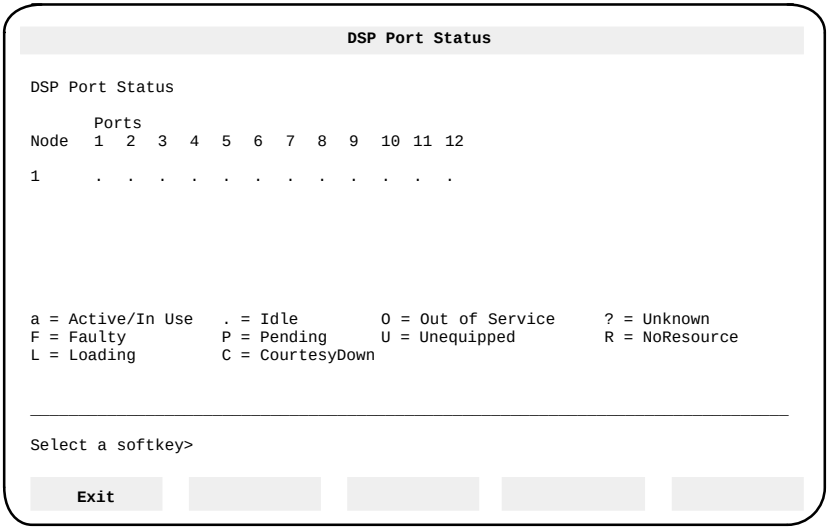
1. Logon to Meridian Mail using the default system password.
2. Change the administration password from the installation default.
3. Verify that remote login works by setting the A/B box switch to “Remote” and dialing in.

   Note: If you are using a high-speed (9600 bps) modem (for example, the Ventel Plus II), and the connection fails, wait 15 seconds before attempting to reconnect.
4. Reset the A/B switch to “Local”.
5. Make sure the customer number is correct.

   The system is delivered with the customer number already configured. Check the General Options function under the General Administration menu item.
6. Check that the voice service DNs (Voice Messaging, Express Messaging, and so on.) are correctly set up. Use the Voice System Administration menu, Voice Service DN table.
7. If you have made any changes to the system, reboot the system as described below:
   a. Power down the system for 10 seconds then power back on.
   b. Check the system by adding some mailboxes and using some Meridian Mail features.
8. Logout.
9. Check the status of each DSP port to make sure they are all functional. Press the [DSP Port Status] softkey. DSP Port Status should be Idle for all ports. See Figure 13-4.

   Note: For a full description of this screen, see the *System Administration Guide*. This document also describes how to run out-of-service diagnostics for ports which do not come to idle status on bootup, or to active status during the testing described in steps 10 to 12.

Figure 13-4
DSP Port Status screen



10 While watching this screen, dial the voice messaging DN from a phone connected to the switch.

11 Note which channels become active.

12 Ensure there is no noise on the line.

13 Release, and repeat steps 10 to 12 until all ports have been tested.

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

15 Replace the faceplates that cover the disk/tape drive areas.

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

Acceptance testing of Meridian Mail

1 Check basic features by performing all functions outlined in the *Meridian Mail Voice Messaging User Guide* (P0730459).

2 Test optional features using the appropriate NTP. Refer to the *Meridian Mail NTP Contents Overview* (NTP 555-7001-000) for NTP listings for this platform.

3 Test the system and administrative features as described in the *System Administration Guide*.

Chapter 14: Adding a node

Additional disk space or voice channels can be provided to an existing Meridian Mail Modular Option EC system by adding one, or more, nodes to the system. Adding a node can be done in one of two ways depending on your requirements

- ***Incremental expansion*** involves adding only one node and configuring the system. This method should be used if your system requires only the additional amount of disk space or voice channels provided by adding one node.

  Note: If you wish to perform an incremental expansion, you will require the intermediary and final keycode for each node configuration you perform. The keycodes are obtained from your Northern Telecom sales representative when you order your expansion kits.

- ***Multinode expansion*** involves adding several nodes and configuring the system based on the final node configuration (for example, two-, three-, four-, or five-node, shadowed or unshadowed, system). This method should be used if your system requires additional amount of disk space or voice channels that can only be provided by adding several nodes.

  Note that an incremental expansion could be performed to achieve the same result; however, with a multinode expansion you do not have to repeat the intermediary steps involved in an incremental expansion.

Getting started

Read the “Hardware modification” section in the *System Installation and Modification Guide* (NTP 555-7001-215) before continuing with this section. It contains the full list of steps involved as well as important preparation steps.

Node expansion consists of the following tasks. Each task includes a reference to an earlier chapter which will provide more detailed information should you require assistance in carrying out the expansion.

Table 14-1
Node expansion task list

Task	Reference
Unpack and inspect equipment.	Chapter 4
If necessary, install Meridian Mail columns and modules, including power and grounding, and earthquake protection.	Chapter 5
Install power supplies.	Chapter 6
Install disk drives and the tape drive	Chapter 7
Configure the backplane and install printed circuit packs (PCPs).	Chapter 8
Install intra- and intermodule cables.	Chapter 9
Install and configure peripheral devices.	Chapter 10
Install Meridian Mail to PBX interface.	Chapter 11
Configure the Meridian 1.	Chapter 12
Start up, configure, and acceptance test Meridian Mail.	Chapter 13

Note 1: The procedures in this chapter refer to CEPS. This should be read as DCEPS for a DC system.

Note 2: The procedures in this chapter refer to powering a module on or off. If the system has more than one Meridian Mail module, power on module MM0, followed by module MM1, followed by module MM2. Power modules off in the opposite order.

To turn on an AC system, switch on the upper breaker in each module before the lower breaker. To turn off an AC system, switch breakers off in the opposite order.

To turn on a DC system, switch on the left DCEPS in each module before the right one. To turn off a DC system, switch DCEPS off in the opposite order.

Note 3: If you are adding a module, leave the front and rear doors off the new module, and remove the front and rear doors from the existing modules. Remove the I/O cover from each module.

Note 4: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node. For example, a configuration of VP8, VP8, VP4, VP4 would be acceptable. A configuration of VP8, VP4, VP8 is not recommended due to potential software configuration problems if you later want to expand the number of ports on the node. Also, you cannot skip a voice card slot. For example, a configuration of VP8, blank, VP4 would not be acceptable.

Expanding unshadowed systems

Procedures 14-1 to 14-4 describe how to perform an incremental expansion on an unshadowed Modular Option EC system incrementally. If you want to perform a multinode expansion refer to Procedure 14-5.

CAUTION
Risk of equipment damage
Wear an anti-static wrist strap when handling components. As an additional safety measure, handle components by the edges and, when possible, with the loosened packing material still around the component.

One- to two-node expansion (unshadowed)

Node two is located at the right side of the same module as node 1. See Figure 14-1.

Procedure 14-1
Expanding from a 1- to a 2-node unshadowed system

1 Power down the module.

Note: The system must be properly “courtesied down” before being powered down. For more information on courtesy down procedures, refer to the “System status and maintenance” chapter in the *System Administration Guide* appropriate to your site.

2 Insert the additional CEPS, MMP40 card (slot 7), and disk drive (slot MSU4) into node 2 (Node Z) as indicated in Figure 14-1.

Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7.

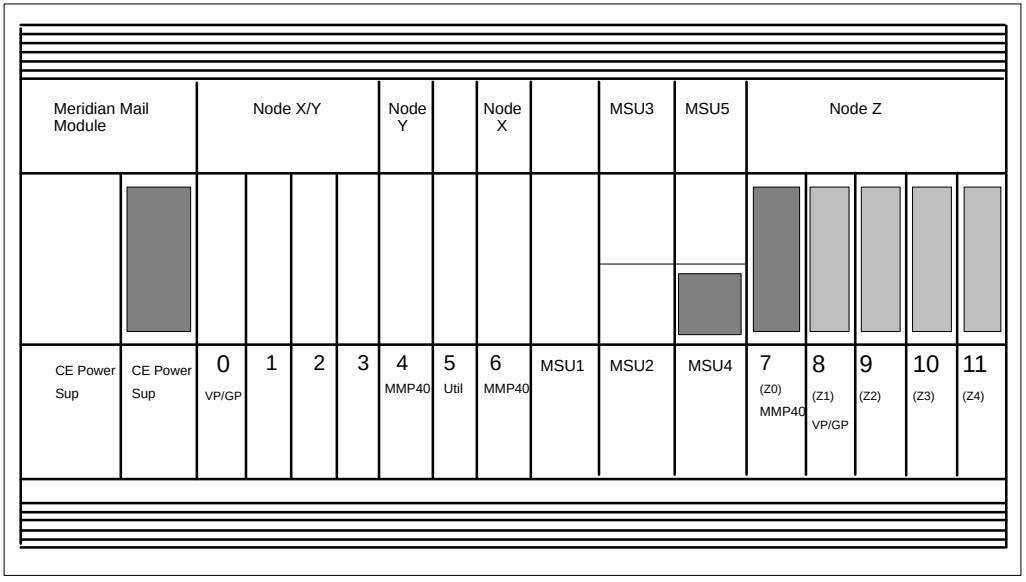
3 Remove the VP4 or VP8 cards from slots 0 to 3 as necessary, and install them, along with the VPs supplied for expansion, as follows:

- Install 24 ports in slots 8 to 11.
- Then install a maximum of 24 ports in slots 0 to 3.

  Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node. (See Figure 14-1).

4 If you are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of the module. See Chapter 11 for details.

Figure 14-1
Adding node 2 to an unshadowed system



5 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up module MM0 again and observe the hexadecimal display on node 2.

The hexadecimal display should increment to at least .6 on the non-prime node.

f. If the hexadecimal display on node 2's MMP40 card reaches .6, (this indicates that the testing has successfully completed), power off the module and proceed with the software expansion (Step 6).

g. If the hexadecimal display on node 2's MMP40 card does not increment to .6, then power off the module, replace node 2's MMP40 card, and try again (return to Step e.).

6 Turn to "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

7 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 of this guide for details.

Two- to three-node expansion (unshadowed)

Node 3 is located in the same module as nodes 1 and 2. See Figure 14-2.

Note: If you are expanding to a three-node unshadowed system, the Address Jumper board is not required.

Procedure 14-2
Expanding from a 2- to a 3-node unshadowed system

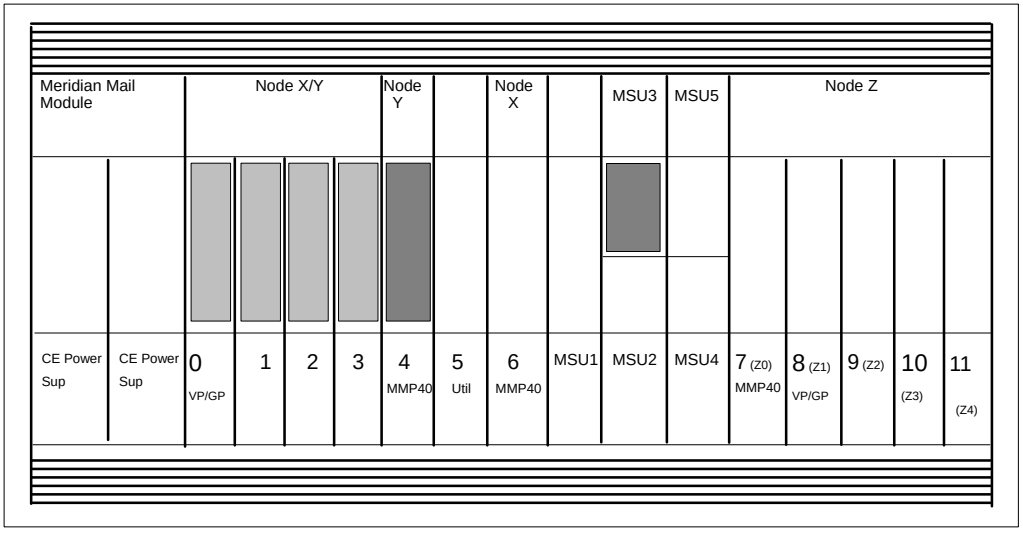
1 Power down the module.

Note: The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.

2 Insert the MMP40 card (slot 4) and disk drive (slot MSU3) into node 3 (Node X/Y) as indicated in Figure 14-2.

Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7.

Figure 14-2
Adding node 3 to an unshadowed system



3 Remove and install VP4 or VP8 cards as necessary to meet the following criteria:

- Install 24 ports in slots 8 to 11.
- Then install a maximum of 24 ports in slots 0 to 3.

Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node.

4 Remove the address jumper located between slots 4 and 5 of the backplane. See Chapter 8 for details. Label this jumper as “Address Jumper” and store. You will need this jumper if you decide later to install disk shadowing.

5 If you have not yet installed a second network loop, and are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of the module. See Chapter 11 for details.

6 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1’s MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up module MM0 again and observe the hexadecimal display on the MMP40 cards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. If the hexadecimal display on each non-prime node's MMP40 card reaches .6 (this indicates that the testing has successfully completed), power off the module and proceed with the software expansion (Step 7).

g. If the hexadecimal display on any MMP40 card does not increment to .6, then power off the module, replace that MMP40 card and try again (return to Step e.).

7 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

8 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Three- to four-node expansion (unshadowed)

Determine where the expansion module should be placed, according to *Meridian Mail Modular Option EC Site and Installation Planning* (NTP 555-7061-200).

Procedure 14-3
Expanding from a 3- to a 4-node unshadowed system

1 Power down the system.

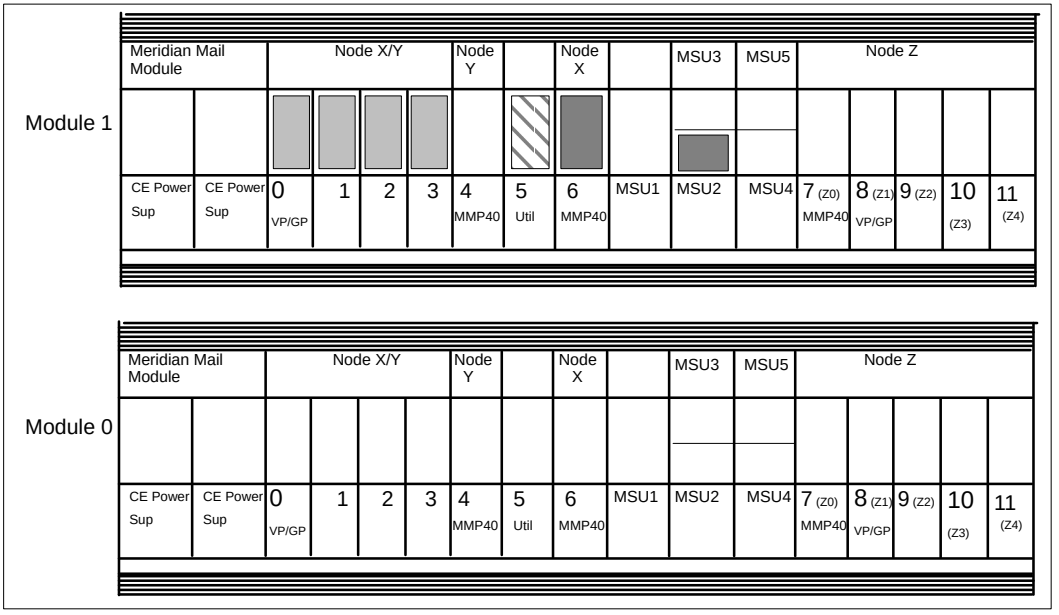
Note: The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.

2 Install the new module. Refer to the section on "Adding a module to a column" in *SL-1 System Installation Procedures* (NTP 553-3001-210).

3 Insert the CEPS, MMP40 card (module MM1, slot 6) and disk drive (module MM1, slot MSU2) into node 4 as indicated in Figure 14-3.

Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7.

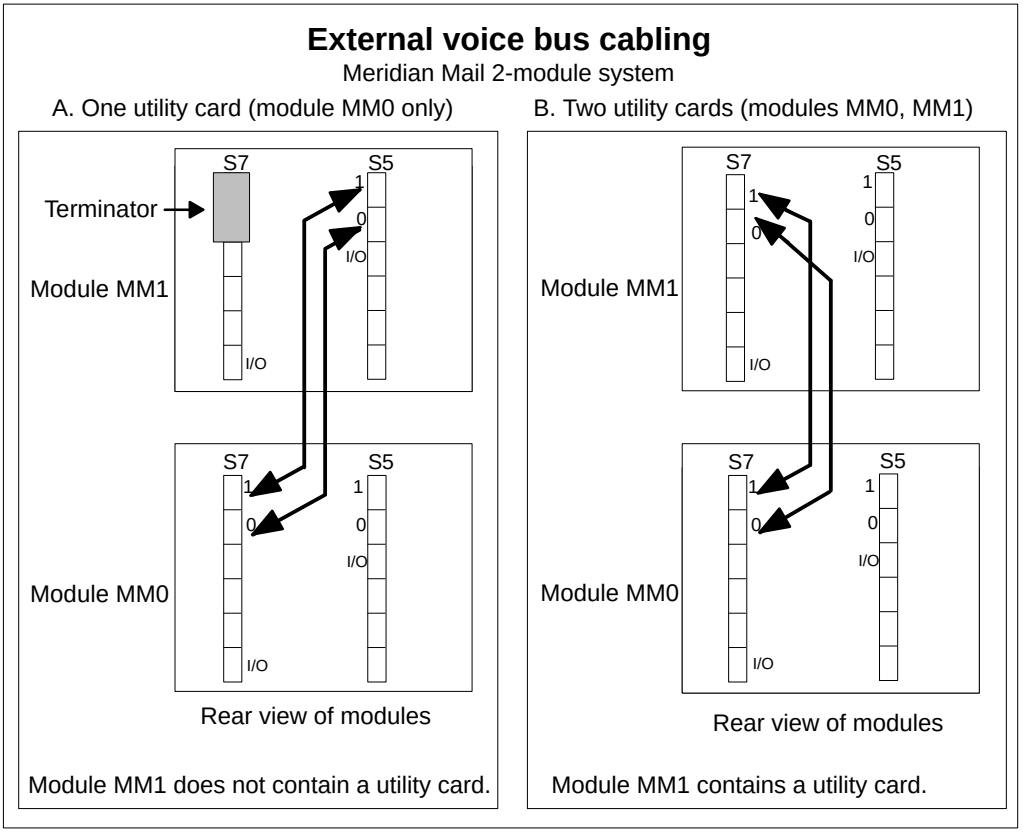
Figure 14-3
Adding node 4 to an unshadowed system



4 If you need extra RS-232 ports, install a utility card (module MM1, slot 5).

5 Install the EVB cables as shown in Figure 14-4. If you did not install a utility card, install an EVB terminator on shroud S7 in module MM1 (unless you are going to have more than 48 ports. See Chapter 9 for details.

Figure 14-4
Intermodule cabling for a two-module system



6 Ensure switch settings on the backplanes of both modules are correct. See Chapter 8 for details.

7 If you have not yet installed a second network loop and are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11 for details.

8 If you are going to have more than 48 ports

a. install a utility card in module MM1, slot 5, if you have not already installed a utility card in this slot.

b. install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM1. See Chapter 11 for details.

c. remove the EVB terminator, if there is one, from shroud S7 in module MM1

9 Remove and install VP4 or VP8 cards as necessary to meet the following criteria:

Module 0

- Install 24 ports in slots 8 to 11.
- Install 24 ports in slots 0 to 3.

Module 1

- Install a maximum of 24 ports in slots 0 to 3.

Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node.

10 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up both modules and observe the hexadecimal display on the MMP40 cards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. After the hexadecimal display on each non-prime node's MMP40 card reaches .6, the testing has successfully completed. Power off all modules and proceed with the software expansion (Step 11).

g. If the hexadecimal display on any MMP40 card does not increment to .6, then power off the module, replace that MMP40 card and try again from Step e.

11 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

12 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Four- to five-node expansion (unshadowed)

Node 5 is installed in the existing module that houses node 4.

Procedure 14-4
Expanding from a 4- to a 5-node unshadowed system

1 Power down the system.

> ***Note:*** The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.

2 Insert the additional CEPS, MMP40 card (module MM1, slot 7) and disk drive (module MM1, slot MSU4) into node 5 as indicated in Figure 14-5.

> ***Note:*** Before you install the disk unit, verify its jumper settings. Refer to Chapter 7.

3 If you have not yet installed a second network loop and are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11 for details.

4 If you are going to have more than 48 ports

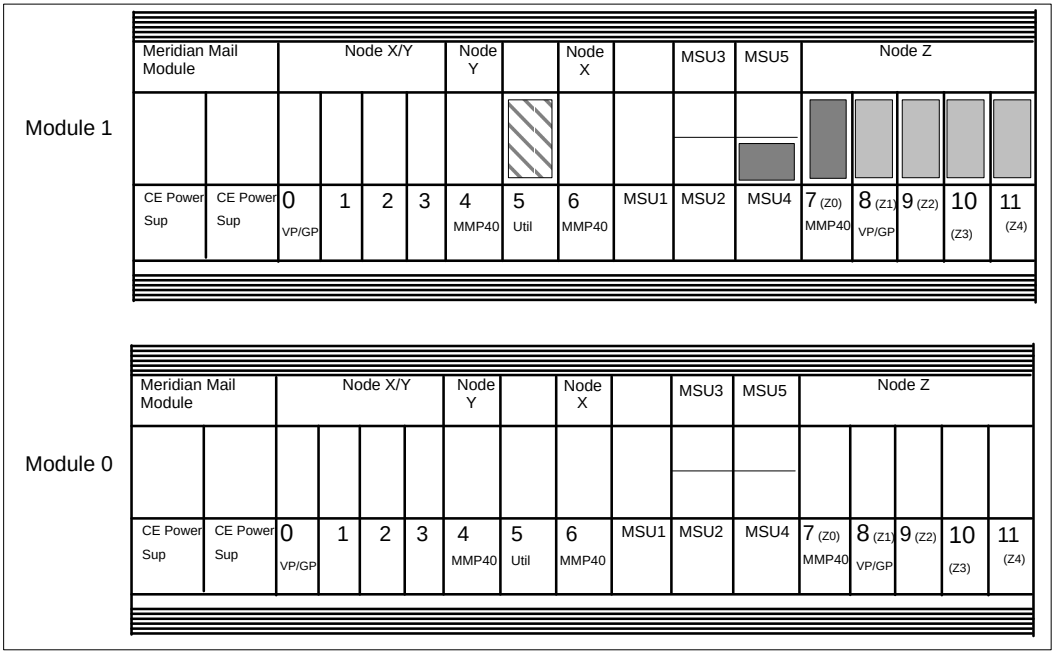
a. install a utility card in module MM1, slot 5, if you have not already installed a utility card in this slot.

b. install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM1. See Chapter 11 for details.

c. remove the EVB terminator, if there is one, from shroud S7 in module MM1.

5 If you are going to have more than 72 ports, install a fourth network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM1. See Chapter 11 for details.

Figure 14-5
Adding node 5 to an unshadowed system



6 Remove and install VP4 or VP8 cards as necessary to meet the following criteria:

Module 0

- Install 24 ports in slots 8 to 11.
- Install 24 ports in slots 0 to 3.

Module 1

- Install 24 ports in slots 0 to 3.
- Then install a maximum of 24 ports in slots 8 to 11.

Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node.

7 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up all the modules and observe the hexadecimal display on the MMP40 cards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. After the hexadecimal display on each non-prime node's MMP40 card reaches .6, the testing has successfully completed. Power off all modules and proceed with the software expansion (Step 8).

g. If the hexadecimal display on any MMP40 card does not increment to .6, then power off the module, replace that MMP40 card and try again (return to Step e.).

8 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

9 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Multinode expansion

An unshadowed Meridian Mail Modular Option EC can be expanded by several nodes at one. To perform a multinode expansion refer to procedure 14-5.

Procedure 14-5
Performing a multinode expansion on unshadowed systems

1 Install all the required hardware (that is, CEPS, MMP40 card, disk drives, and network cabling). Refer to the appropriate figures to determine hardware requirements and location.

For example, if you want to expand to a four-node unshadowed system refer to the following illustrations:

- *Figure 14-1 "Adding node 2 to an unshadowed system"*
- *Figure 14-2 "Adding node 3 to an unshadowed system"*
- *Figure 14-3 "Adding node 4 to an unshadowed system"*

Note: New hardware added for expansion is inserted in slots as indicated by the shaded areas ( ) in all the figures within this chapter.

2 Follow the software instructions listed in the procedure for your final node configuration.

For example, to expand to a four-node unshadowed system refer to the section entitled "Three- to four-node expansion (unshadowed)" and follow the software steps listed there.

Expanding shadowed systems

Procedures 14-6 to 14-9 describe how to perform an incremental expansion on an unshadowed Modular Option EC system incrementally. If you want to perform a multinode expansion refer to Procedure 14-10.

CAUTION
Risk of equipment damage
Wear an anti-static wrist strap when handling components. As an additional safety measure, handle components by the edges and, whenever possible, with the loosened packing material still around the component.

One- to two-node expansion (shadowed)

Node two is located at the right side of the same module as node 1. See Figure 14-6.

Procedure 14-6
Expanding from a 1-node to a 2-node shadowed system

1 Power down the module.

Note: The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.

2 Insert the additional CEPS, MMP40 card (slot 7) and disk drives (slots MSU4 and MSU5) into node 2 (Node Z) as indicated in Figure 14-6.

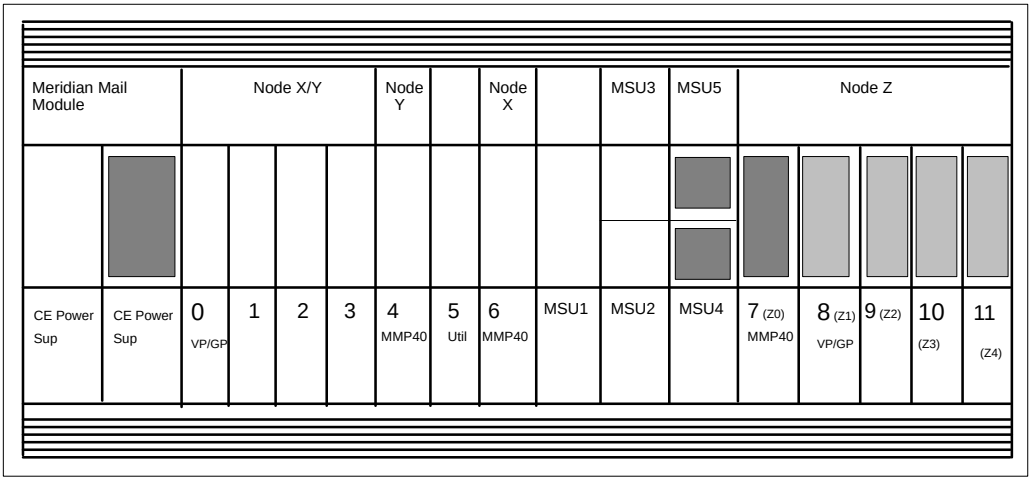
Note: Before you install the disk units, verify their jumper settings. Refer to Chapter 7.

3 Remove the VP4 or VP8 cards from slots 0 to 3 as necessary, and install them, along with the VPs supplied for expansion, as follows:

- Install 24 ports in slots 8 to 11.
- Then install a maximum of 24 ports in slots 0 to 3.

Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node. (See Figure 14-6.)

Figure 14-6
Adding node 2 to a shadowed system



4 If you are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of the module. See Chapter 11 for details.

5 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up module MM0 again and observe the hexadecimal display on node 2.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. After the hexadecimal display on node 2's MMP40 card reaches .6, the testing has successfully completed. Power off the module and proceed with the software expansion (Step 6).

g. If the hexadecimal display on node 2's MMP40 card does not increment to .6, then power off the module, replace node 2's MMP40 card and try again from Step e.

6 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

7 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Two- to three-node expansion (shadowed)

Determine where the expansion module should be placed, according to *Meridian Mail Modular Option EC Site and Installation Planning* (NTP 555-7061-200).

Procedure 14-7
Expanding from a 2- to a 3-node shadowed system

1 Power down the system.

Note: The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.

2 Install the new module. Refer to the section on "Adding a module to a column" in *SL-1 System Installation Procedures* (NTP 553-3001-210).

3 Insert the CEPS, MMP40 card (module MM1, slot 6) and disk drives (module MM1, slots MSU2 and MSU3) into node 3 (Node X/Y) as indicated in Figure 14-7.

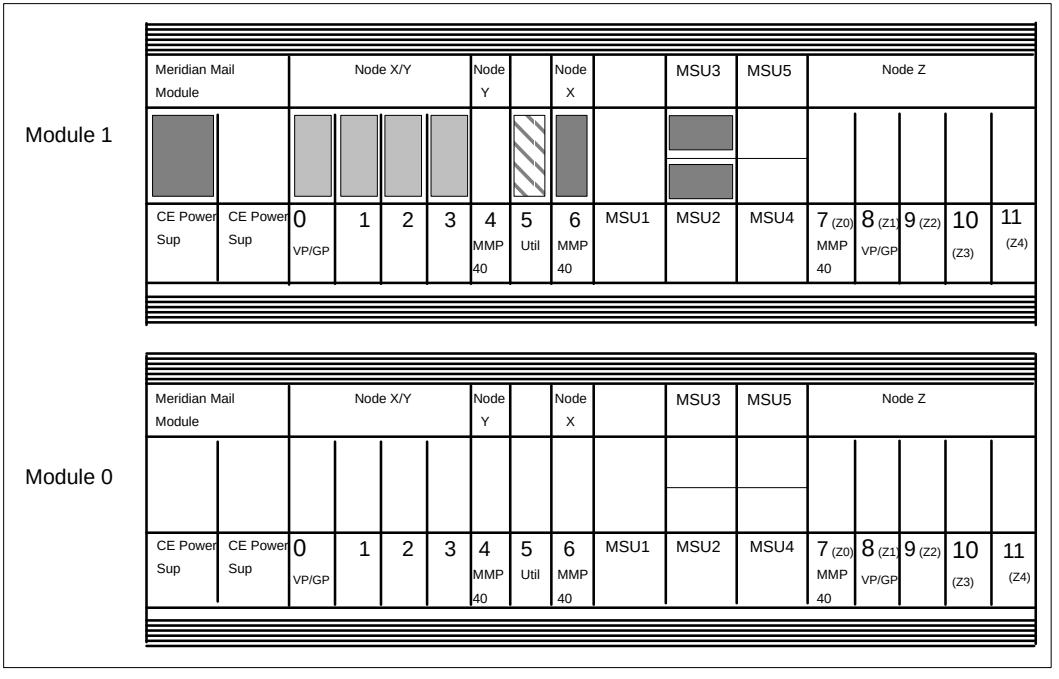
Note: Before you install the disk units, verify their jumper settings. Refer to Chapter 7.

4 If you need extra RS-232 ports, install a utility card (module MM1, slot 5).

5 Install the EVB cables as shown in Figure 14-8. If you did not install a utility card, install an EVB terminator on shroud S7 in module MM1. See Chapter 9 for details.

6 Ensure switch settings on backplanes of both modules are correct. See Chapter 8 for details.

Figure 14-7
Adding node 3 to a shadowed system



7 Remove and install VP4 or VP8 cards as necessary to meet the following criteria:

Module 0

- Install 24 ports in slots 8 to 11.

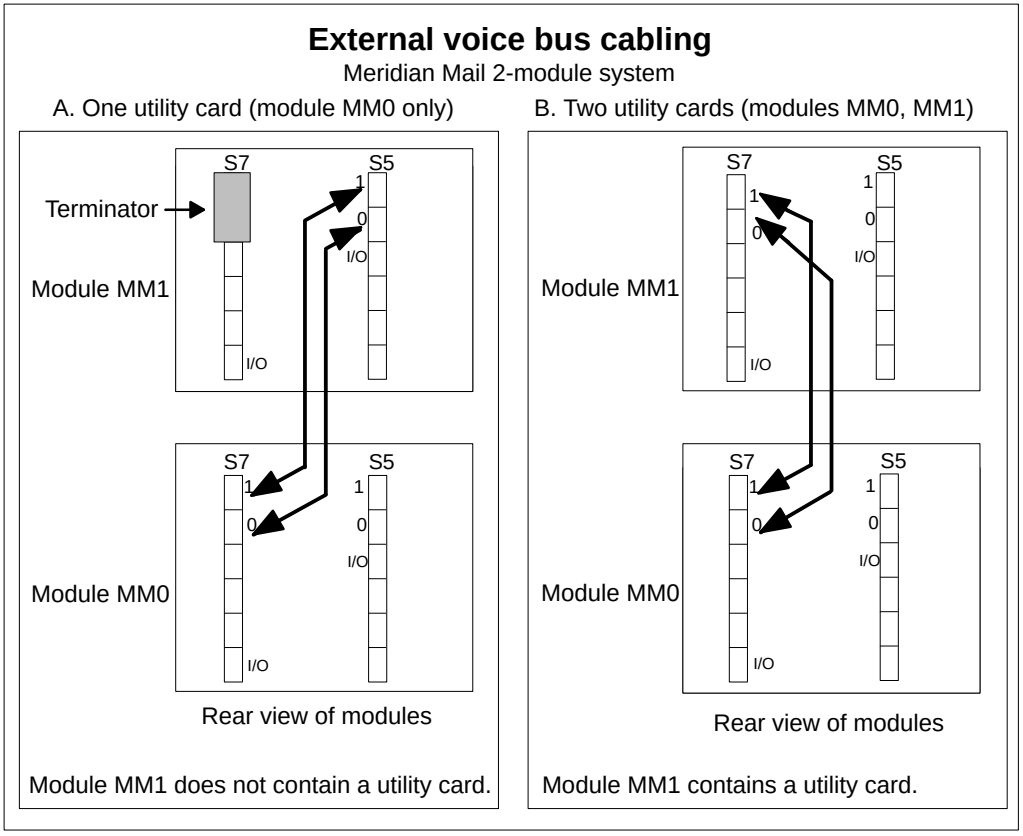
Module 1

- Then install a maximum of 24 ports in slots 0 to 3.

  Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node.

8 If you are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11 for details.

Figure 14-8
Intermodule cabling for a two module system



9 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up all the modules and observe the hexadecimal display on the MMP40 cards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. After the hexadecimal display on each non-prime node's MMP40 card reaches .6, the testing has successfully completed. Power off all modules and proceed with the software expansion (Step 10).

g. If the hexadecimal display on any MMP40 card does not increment to .6, then power off the module, replace that MMP40 card and try again (return to Step e.).

10 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

11 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Three- to four-node expansion (shadowed)

Node 4 is located in the same module as node 3.

Procedure 14-8
Expanding from a 3- to a 4-node shadowed system

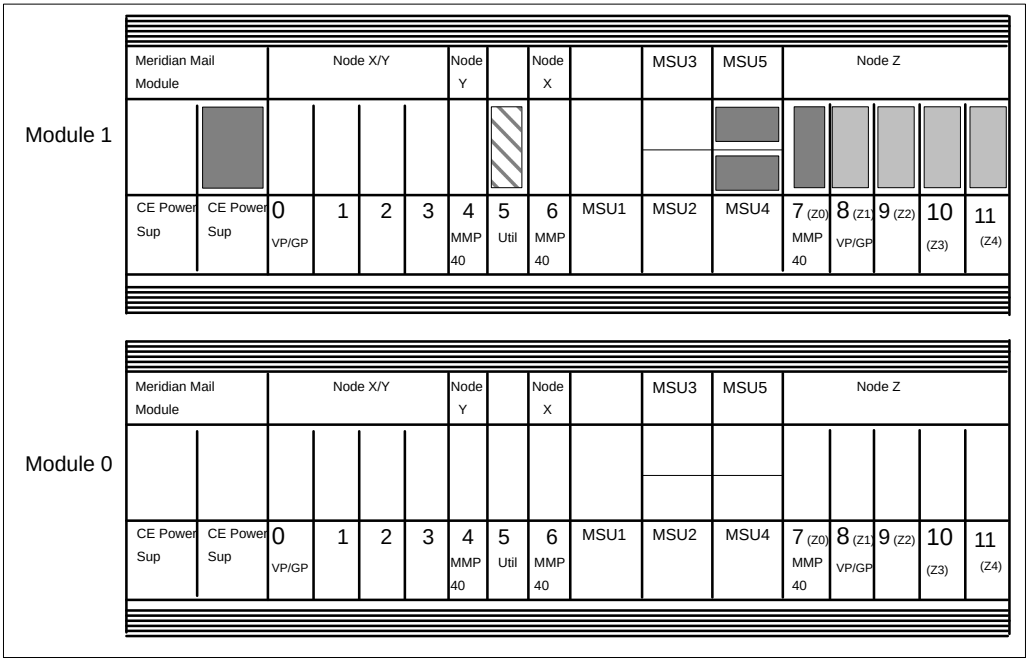
1 Power down module.

Note: The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide*.

2 Insert the additional CEPS, MMP40 card (module MM1, slot 7) and disk drives (module MM1, slots MSU4 and MSU5) into node 4 as indicated in Figure 14-9.

Note: Before you install the disk units, verify their jumper settings. Refer to Chapter 7.

Figure 14-9
Adding node 4 to a shadowed system



3 If you need extra RS-232 ports, and have not already installed a utility card in module MM1, install a utility card (module MM1, slot 5) and remove the EVB terminator, if there is one, from shroud S7 in module MM1.

4 If you have not yet installed a second network loop, and are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11 for details.

5 If you are going to have more than 48 ports

a. install a utility card in module MM1, slot 5, if you have not already installed a utility card in this slot.

b. install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM1. See Chapter 11 for details.

c. remove the EVB terminator, if there is one, from shroud S7 in module MM1.

6 Remove and install VP4 or VP8 cards as necessary to meet the following criteria:

Module 0

- Install 24 ports in slots 8 to 11.

Module 1

- Install 24 ports in slots 0 to 3.
- Then install a maximum of 24 ports in slots 8 to 11.

Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node.

7 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up both modules and observe the hexadecimal display on the MMP40 cards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. After the hexadecimal display on each non-prime node's MMP40 card reaches .6, the testing has successfully completed. Power off all modules and proceed with the software expansion (Step 8).

g. If the hexadecimal display on any MMP40 card does not increment to .6, then power off the module, replace that MMP40 card and try again (return to Step e.).

8 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

9 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Four- to five-node expansion (shadowed)

Determine where the expansion module(s) should be placed, according to *Meridian Mail Modular Option EC Site and Installation Planning* (NTP 555-7061-200).

Procedure 14-9
Expanding from a 4- to a 5-node shadowed system

1. Power down the system.

   Note: The system must be properly "courtesied down" before being powered down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.

2. Install the new module. Refer to the section on "Adding a module to a column" in *SL-1 System Installation Procedures* (NTP 553-3001-210).

3. Remove the EVB terminator, if there is one, from shroud S7 in module MM1.

4. Insert the CEPS, MMP40, card (module MM2, slot 6) and disk drive (module MM1, slots MSU2 and MSU3) into node 5 as indicated in Figure 14-10.

   Note: Before you install the disk units, verify their jumper settings. Refer to Chapter 7.

5. If you have a utility card in module MM1, move it to module MM2, slot 5, and remove the EVB terminator, if there is one, from shroud S7 in module MM2.

6. If you have not yet installed a second network loop, and are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11 for details.

7. If you are going to have more than 48 ports

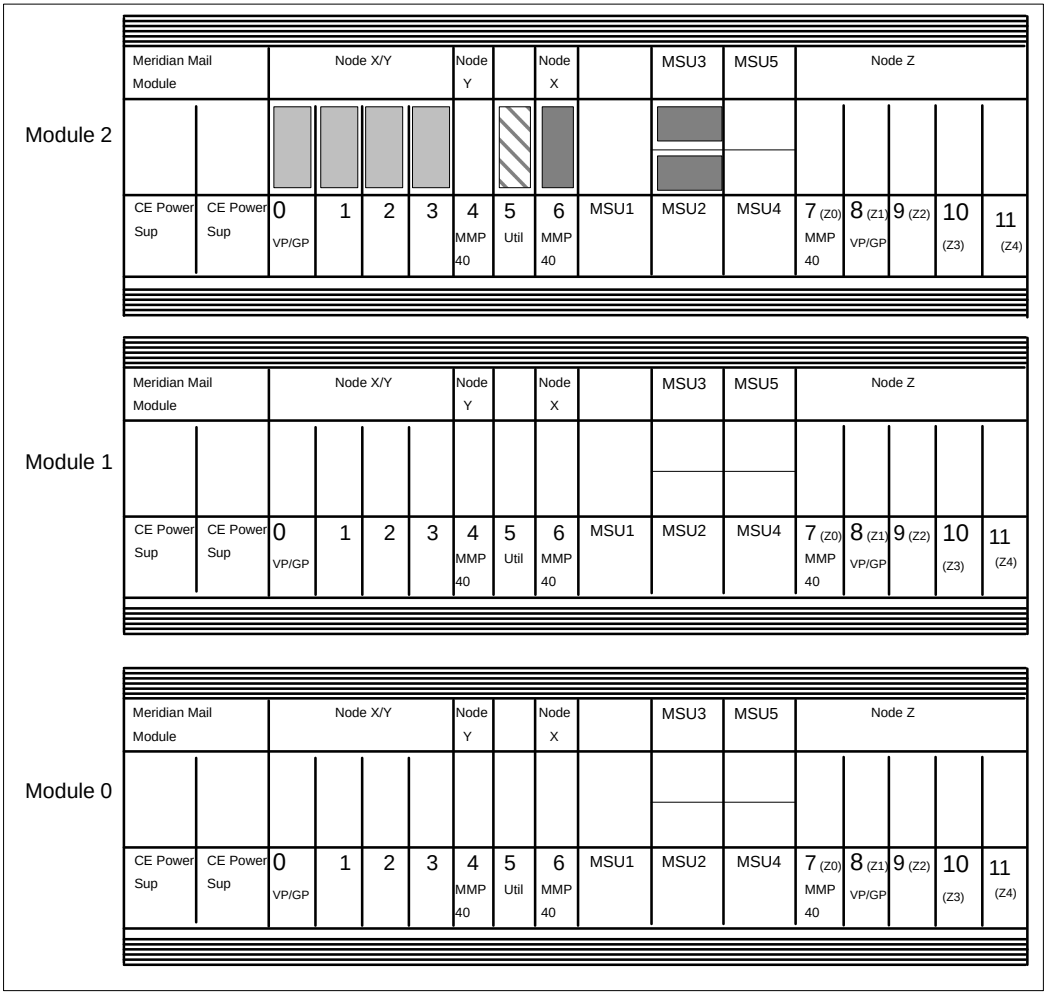
   a. install a utility card in module MM2, slot 5, if you have not already installed a utility card in this slot.

   b. install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM2. See Chapter 11 for details.

   c. remove the EVB terminator, if there is one, from shroud S7 in module MM2.

8. If you are going to have more than 72 ports, install a fourth network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM2. See Chapter 11 for details.

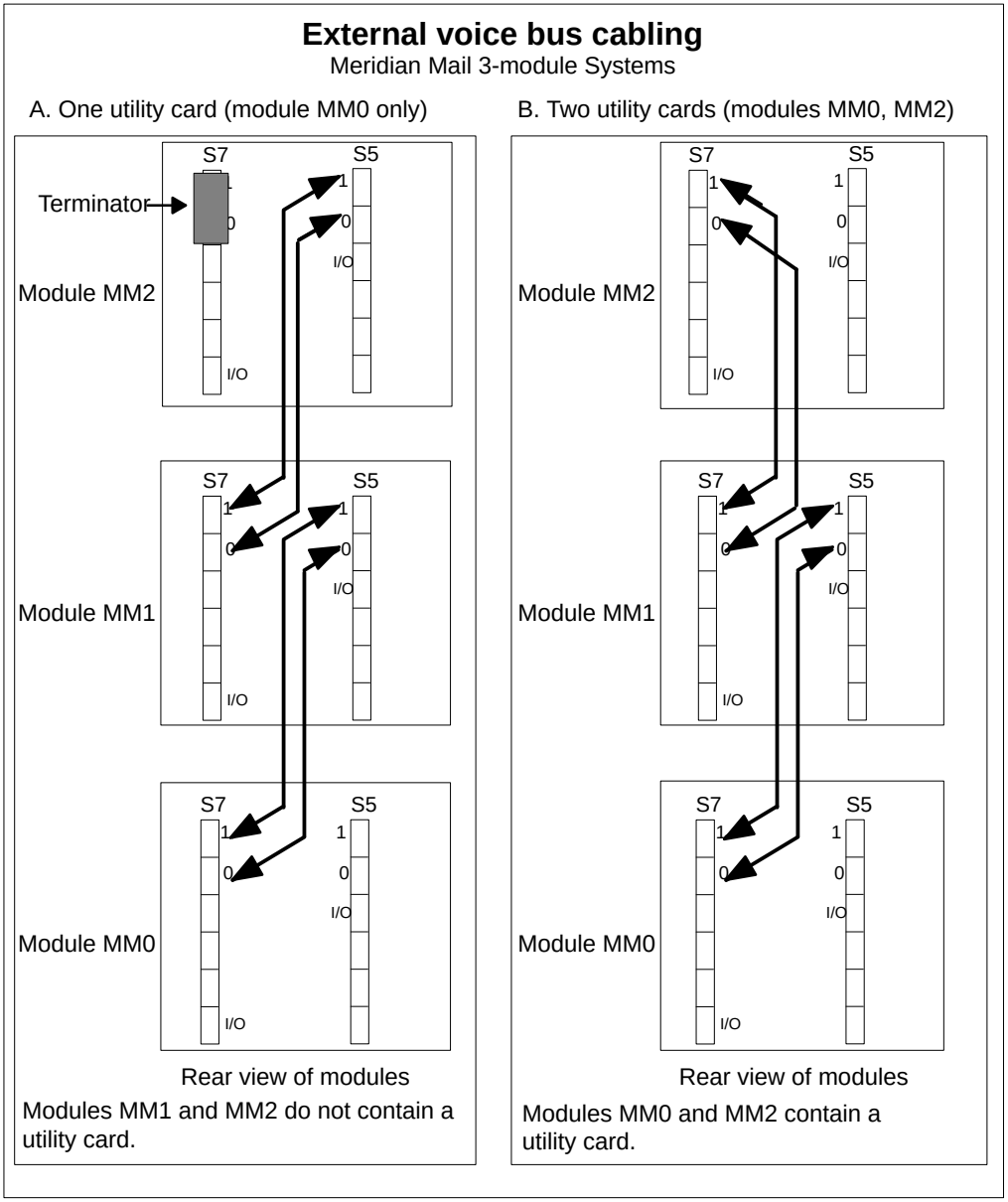
Figure 14-10
Adding node 5 to a shadowed system



9 Install the EVB cable as shown in Figure 14-11.

10 Ensure switch settings on backplanes of all three modules are correct. See Chapter 8 for details.

Figure 14-11
Intermodule cabling for a three module system



11 Remove and install VP4 or VP8 cards as necessary to meet the following criteria:

Module 0

- Install 24 ports in slots 8 to 11.

Module 1

- Install 24 ports in slots 0 to 3.
- Install 24 ports in slots 8 to 11.

Module 2

- Then install a maximum of 24 ports in slots 0 to 3.

Note: Fill up the voice card slots starting from the left in a given node, beginning with any VP8 cards designated for that node.

12 Perform diagnostics as follows:

a. Check that the main administration terminal is connected to node 1.

b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's MMP40 card.

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 16, then go to Chapter 16 for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing has successfully completed, power up all the modules and observe the hexadecimal display on the MMP40 cards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.

f. After the hexadecimal display on each non-prime node's MMP40 card reaches .6, the testing has successfully completed. Power off all modules and proceed with the software expansion (Step 13).

g. If the hexadecimal display on any MMP40 card does not increment to .6, then power off the module, replace that MMP40 card and try again (return to Step e.).

13 Turn to the "EC platform hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215) and go to the step after installing the new hardware.

14 Configure the switch for the TNs corresponding to the ports added. See Chapter 12 for details.

Multinode expansion

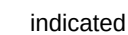
A shadowed Meridian Mail Modular Option EC can be expanded by several nodes at one. To perform a multinode expansion refer to procedure 14-10.

Procedure 14-10
Performing a multinode expansion on shadowed systems

1 Install all the required hardware (that is, CEPS, MMP40 card, disk drives, and network cabling). Refer to the appropriate figures to determine hardware requirements and location.

For example, if you want to expand to a four-node shadowed system refer to the following illustrations:

- *Figure 14-6 "Adding node 2 to a shadowed system"*
- *Figure 14-7 "Adding node 3 to a shadowed system"*
- *Figure 14-9 "Adding node 4 to a shadowed system"*

Note: New hardware added for expansion is inserted in slots as indicated by the shaded areas () in all the figures within this chapter.

2 Follow the software steps outlined in the procedure for your final node configuration.

For example, if your final configuration was a four-node shadowed system refer to the section entitled "Three- to four-node expansion (shadowed)" and follow the software steps listed there.

Chapter 15: Converting from an existing Modular Option EC system to Release 10.0

This chapter describes the hardware changes required when converting from an existing Modular Option EC system to a Meridian Mail Release 10.0 system. If you are also expanding the system (adding nodes), complete the conversion on the existing system first and then refer to Chapter 14 for a complete task list for adding a node.

Before beginning the system installation and modification procedures, unpack and inspect any new printed circuit packs as described in Chapter 4. Then refer to the *System Installation and Modification Guide* to begin the conversion.

For Release 10.0 of Meridian Mail, an MMP40 card is required on all nodes. The MMP40 CPU 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/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. to select the appropriate speed.

Hardware conversion requirements for Release 10.0 depend on whether your system already has MMP40 cards installed. The conversion is also affected by the selected terminal baud rate (2400 or 9600 bps). See Table 15-1 for an overview of the hardware requirements for each conversion scenario.

Table 15-1
Hardware requirements

Hardware	Current configuration	After conversion	Hardware change required
CPU card	68K card in any node	MMP40 card in each node	Insert MMP40 card in every node. See Procedure 15-1.
	MMP40 card in each node	MMP40 card in each node	No change
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 Procedure 15-2.
Tape drive	Archive Viper	Archive Viper	No change
	Archive Viper	Tandberg	Install Tandberg tape drive. See Chapter 7.

All MMP40 cards are shipped from the factory with a default baud setting of 2400 bps. If you decide to use a 9600 bps for your system, you will also have to configure a modem for 9600 bps use. When the MMP40 cards have been installed, with high-speed modems (if required), you must complete a system conversion to the Meridian Mail release 10.0 software.

The Install/data tape is used to convert the existing Modular Option EC system to Release 10.0. Both the terminal and remote support modem must be set to the pre-MM10 speed of 2400 bps.

The system 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 (“Convert from MM8 to MM10” or “Convert from MM9 to MM10”) to complete the software conversion to Release 10.0.

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 succcessully completed as described in the *System Installation and Modification Guide* (NTP 555–7001-215).

For a system which 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 and affix the sticker to indicate that the CPU card is configured for 9600 bps operation. The reason for running the utility after the conversion is that, if the conversion fails, the system can be restored to its previous state without having to reset the terminals and modems. See the *System Installation and Modification Guide* (NTP 555–7001-215) for details.

WARNING
Risk of equipment damage
Wear an anti-static wrist strap when handling components. As an additional safety measure, handle components by the edges and, whenever possible, with the loosened packing material still around the component.

Procedure 15-1
Replacing the 68K card

If your existing system currently uses 68K cards, replace the cards with MMP40 cards for Release 10.0.

1. Unpack and inspect the new hardware as described in Chapter 4.
2. Refer to Chapter 4, “Conversion” 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 towards you until it clears the shelf (see Figure 15-1).
5. Store the 68K card in a safe place. You will need this card if you need to reinstall the old system.

6 Insert the MMP40 card in the module by aligning it with the slots in the module where the 68K card resided. With the ejectors still in the open position, gently slide the card into the module.

7 Seat and lock the card by

   a. pushing on the upper and lower edges of the faceplate to ensure that the card is fully seated in the module

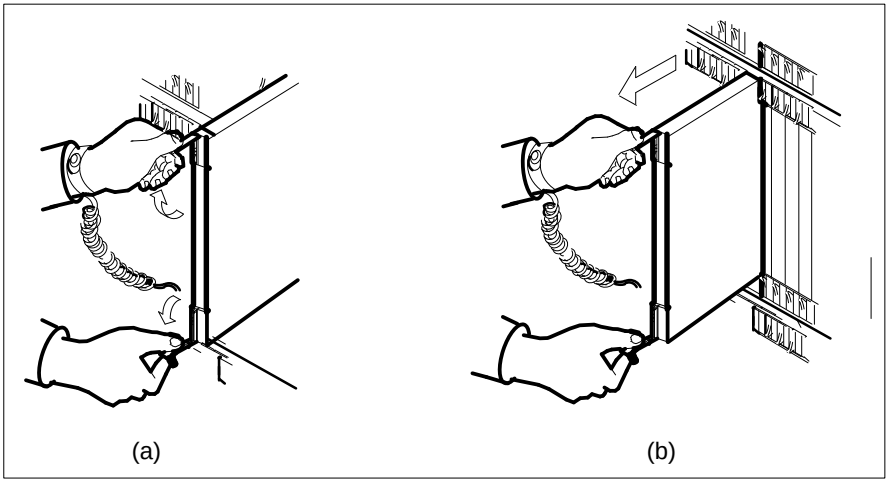
   b. closing the ejectors.

8 Install the supplied designation strips (A0803253) on the Meridian Mail shelves.

9 If the terminal baud rate is to be changed to 9600 bps, affix the sticker to indicate that the CPU card is configured for 9600 bps operation and continue with Procedure 15-2. If the terminal baud rate is to remain at 2400 bps, continue with step 10.

10 Return to the *System Installation and Modification Guide* to continue the system conversion. You are now finished all the necessary hardware changes.

Figure 15-1
Printed circuit pack removal



Procedure 15-2
Installing 9600 bps modems

If you decide to upgrade your terminal baud rate to 9600 bps, new high-speed modems must be installed before the system conversion can be completed.

1. Unpack and inspect the new modem. Refer to Appendix B: Modem configuration, in this manual to ensure the modem is supported for 9600 bps.
2. Install the external modems as outlined in the section entitled “Installing, cabling and configuring peripheral devices” in Chapter 10 in this manual.
3. Return to the *System Installation and Modification Guide* to continue the system conversion. You are now finished all the necessary hardware changes.

Chapter 16: Troubleshooting startup problems

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).

Several troubleshooting procedures recommend that you power down a node or the entire system. A node that does not contain a utility card may be powered down at any time without affecting call activity on other nodes.

If the node to be powered down contains a utility card, the entire system must be powered down.

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 *System Administration Guide* (NTP 555-7001-30x).

If the system has more than one Meridian Mail module, power off module MM2, followed by module MM1, followed by module MM0. Power modules on in the opposite order.

In an AC system, switch off the lower breaker in each module before the upper breaker. Switch breakers on in the opposite order.

In a DC system, switch off the right DCEPS in each module before the left one. Switch DCEPS on in the opposite order.

Reference documents

Documents referenced for maintenance or troubleshooting procedures in this manual are listed below:

- *Meridian Mail System Administration Guide* (NTP 555-7001-301) for single-customer sites
- *Meridian Mail System Administration Guide for Multi-customer Systems* (NTP 555-7001-302) for multi-customer sites
- *Meridian Mail Maintenance Messages (SEERs) Guide (NTP 555-7001-510)*
- *X11 Input/Output Guide* (NTP 553-3001-400)
- *SL-1 Fault Clearing* (NTP 553-3001-510)

Normal startup sequence

When you power on Meridian Mail, the MMP40 card 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.

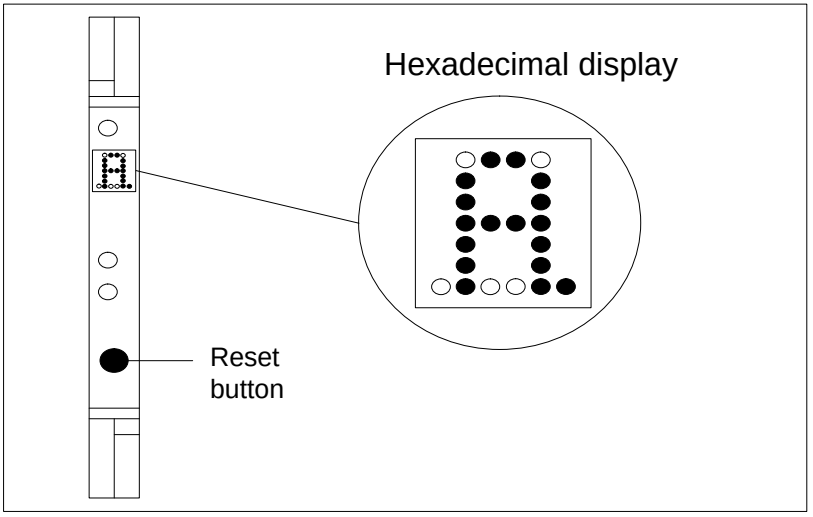
The MMP40 initialization phase can be monitored using the hexadecimal display on the MMP40 card. The bootup can usually be monitored using the text displayed on the terminal. The following sections describe the LED, hexadecimal display, and the progression through bootup.

> ***Note:*** If you encounter difficulty during a normal startup sequence, refer to Appendix D: MMP40 Troubleshooting Flowcharts, to determine causes and solutions for potential problems.

Power on initialization—LED and hexadecimal display description

On the upper-front edge of the MMP40 card is a hexadecimal display that can display a hexadecimal digit with an optional decimal point on either side of it. The display provides information for diagnosing some system problems in the field. See Figure 16-1.

Figure 16-1
Hexadecimal display on MMP40 card



CAUTION
Risk of system stress
To reduce stress on the system, use the RESET button on the faceplate of the 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.

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.

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 MMP40 board, this state will generally not be seen because of the very quick transition to the .0 state.

Table 16-1 shows the typical progression of the startup indications on the hexadecimal display.

On other Meridian Mail components, the LEDs can also be used to check that the startup is proceeding normally (see Table 16-2).

Table 16-1
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 standalone)
.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).

Table 16-2
Behavior of LED indicators

Location of LED	Color	Behavior
Power Supplies	Green	On while power switch (DC) or shelf breaker (AC) is on
VP	Green	On while power to node is on
MMP40 (hexadecimal display)	Red	Always on while power to node is on. Can display numbers 0 to 9 or letters A to F (representing a hexadecimal number), plus a dot to the left and/or right of the letter or number.

Normal bootup sequence—messages on terminal

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

Table 16-3 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 is dependent upon your specific configuration.

You may set the printer to print out a hardcopy of the bootup sequence as described in Procedure 16-1.

If bootup does not proceed as described in Table 16-3, look in the "Symptom" column of Table 16-4 to identify the problem, and then follow the corresponding steps in the "Possible causes and actions" column. You can also refer to the MMP40 Troubleshooting Flowcharts in Appendix E to determine causes and solutions for potential problems with the MMP40 card.

Procedure 16-1
Printing a hard copy of the bootup sequence

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.
4. Compare the bootup printout to the information presented in Table 16-3.

Table 16-3
Bootup stages – MMP40 system

Stage	Key phrases	Comments
1	Waiting for timer... . . . Copyright 19YY, Northern Telecom ********** * NT4R45aa Firmware * * MMP40FW * * Mmmm DD, 19YY * ********** . . .	Where “aa” can be any two letters and “Mmmm DD, 19YY” 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 board level diagnostics
3	Performing SCSI Bus Reset...OK. . . .	
4	SCSI initialization complete. . . .	

–continued–

Table 16-3
Bootup stages - MMP40 system (continued)

Stage	Key phrases	Comments
5	`Meridian Mail Kernel Startup` . . .	
6	`OSP successfully loaded` . . .	Terminal screen should clear. Operating system 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.

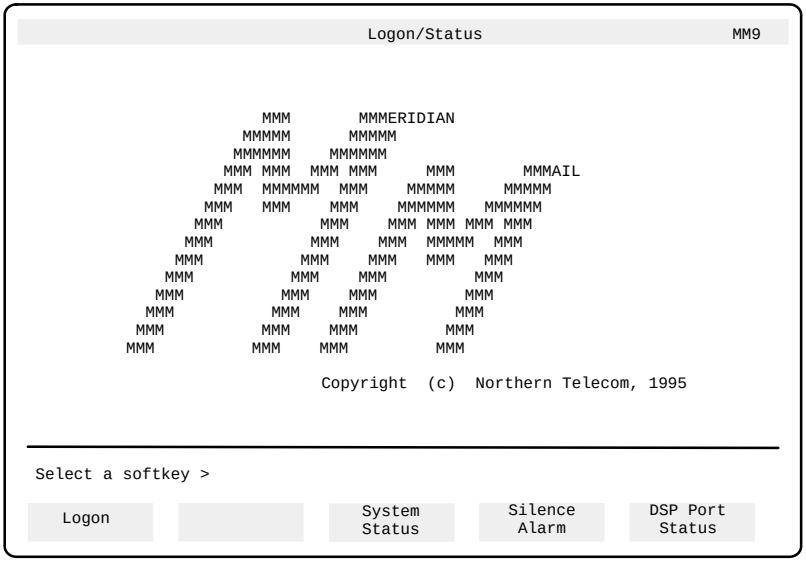
9	`PRM: Waiting for Seer Server to register`
	.
	.
	.
	
	`PRM RebootNode: resetting node 2 waittime 0`
	.
	.
	.
		SEER output on the printer should be expected a few seconds after this message.
		
		If this is a multi-node system, then all the non-prime nodes will be reset here.

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.

11	`PRM: Startup diags finished, starting up system`	Application programs are to be loaded.
12	The Logon screen comes up as shown in Figure 16-2.	
–end–		

When the bootup and bootROM diagnostic messages end, the Meridian Mail logon screen should appear (Figure 16-2).

Figure 16-2
The Logon screen

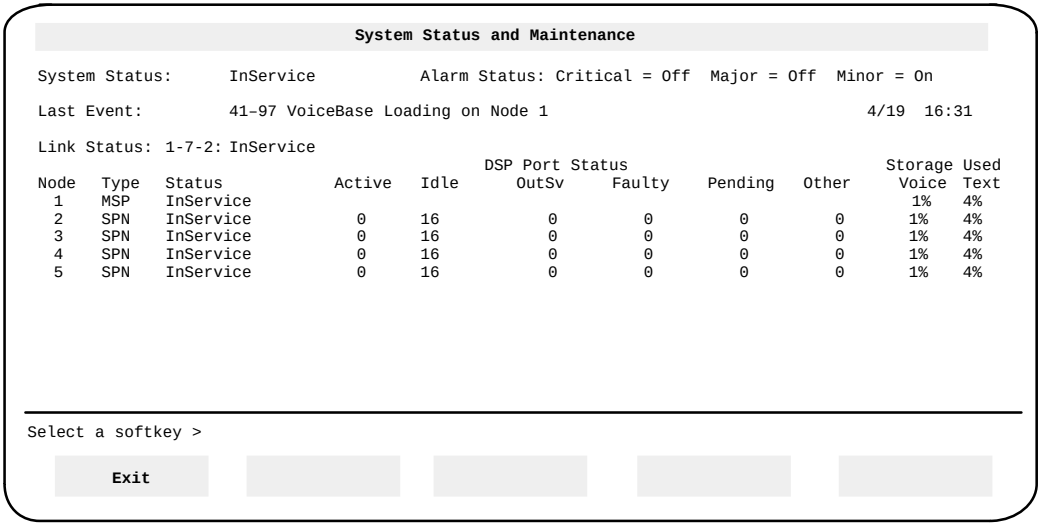


If bootup does not proceed as described above, look in the "Symptom" column of Table 16-4 to identify the problem, then follow the corresponding steps in the "Possible causes and actions" column.

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 nodes, link status should be InService, and DSP Port Status should be Idle for all of the voice ports you have installed. See Figure 16-3.

Figure 16-3
System Status screen (5-node system)



```
                              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   Other     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
```

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 chapter “System status and maintenance” in the *System Administration Guide* for further information on the status of the system, link, nodes, and ports.

For further details regarding voice channel status, press [Exit] then [DSP Port Status]. The DSP Port Status screen appears. See Figure16-4.

Figure 16-4
DSP Port Status screen

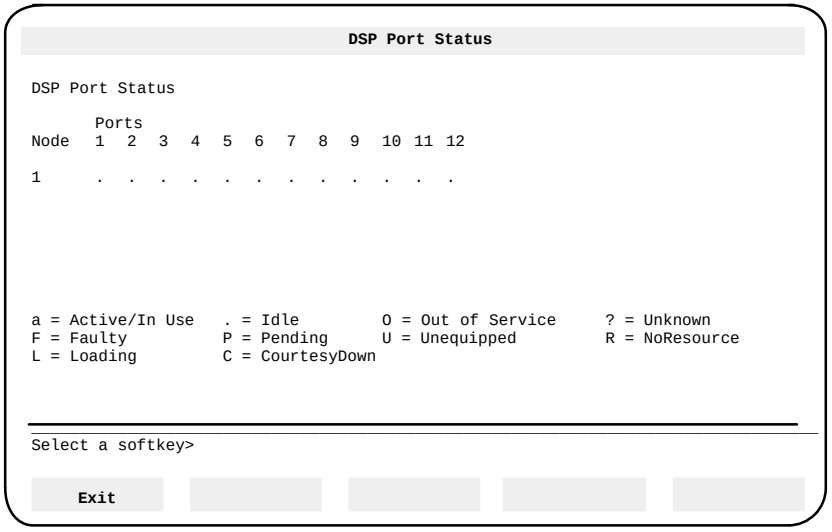


Table 16-4
Bootup problems

Symptom	Possible causes and actions
Admin terminal screen remains blank	Follow Procedure 16-2, “If terminal remains blank.”
Messages stop appearing on the screen, but the Meridian Mail logon screen does not appear	Follow the procedures described in the section entitled “System fails to boot completely” later in this chapter.
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 Procedure 16-21, System bus diagnostics. If only one node is faulty, run OutOfService Diagnostics on that node’s CPU card.
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).
Node continually reboots	1 Replace the CPU card. 2 Perform the system bus checks. Follow Procedure 16-21, System bus diagnostics.
Logon screen appears, but not all voice channels come into service	Ports may be left Faulty or unconfigured due to hardware problems. Review port status on DSP Port Status screen. Ports may be left Loading, Pending, or No Resources due to configuration or software problems. Run OutOfService Diagnostics as described in the *System Administration Guide* and then enable the voice card.
Disk errors on bootup–device sense key, or driver errors	Refer to Procedures 16-13 and 16-14, as well as Chapter 19 “Common disk subsystem problems.”
All nodes time-out while booting or nodes unload while in service	1 Perform the system bus checks. Follow Procedure 16-21, System bus diagnostics. 2 Perform BootROM diagnostic check procedure for the node.
Only one node comes up	Perform the system bus checks. Follow Procedure 16-21, System bus diagnostics.

–continued–

Table 16-4
Bootup problems (continued)

Symptom	Possible causes and actions
Logon screen appears, but link status is not InService	Go to Chapter NO TAG, AML link maintenance.
One node will not come up	Perform BootROM diagnostic check procedure for the node.
Hexadecimal display on MMP40 card shows **B**	Indicates node is in-service standby. Minor software error. Contact your NT support organization.
Hexadecimal display on MMP40 card shows **C**	Indicates node is out of service. Enable the node from the MMI as described in the *System Administration Guide.*
Hexadecimal display on MMP40 card shows **D**	Indicates in-service trouble. While the MMP40 card is still healthy, a component such as a VP card or a disk may be faulty. Check the VP cards for that node and perform Procedures 16-13 and 16-14, and refer to Chapter 19.
Hexadecimal display on the MMP40 card (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 whether or not the system is running normally. Reboot the system and observe the display. If the problem persists, contact your NT support organization.
Hexadecimal display on MMP40 card flashes continuously.	Indicates a faulty MMP40 card. 1 Note the state at which the display began flashing. 2 Replace the MMP40 card.
Hexadecimal display on 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 state reverts to .0 and contact your NT support organization.
Hexadecimal display on MMP40 card stops at a particular bootup state.	Take note of the state at which the display stopped and reboot the system. If the problem persists, call your NT support organization.
–end–	

Troubleshooting terminal problems

The procedures contained in the following sections should allow you to determine if there is a problem with the Meridian Mail terminal, or the prime node MMP40 card. Follow each step in the troubleshooting procedure until you have solved the problem.

If terminal remains blank

Procedure 16-2
If terminal remains blank

1 Reboot the system and observe the hexadecimal display on the prime node's MMP40 card. If the display increments past .3, then there is a problem with the terminal.

Go to step 2 if the terminal power light is not lit or else go to step 3.

2 If the power LED 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 Procedure 16-3.

f. If the power LED remains unlit, replace the prime node's MMP40 card and return to step 1 of this procedure.

3 If the hexadecimal display does not increment past .3, proceed as follows:

a. Check for Meridian Mail power problems as described in Procedures 16-4 to 16-8.

b. If these tests fail, replace the prime node's MMP40 card and return to step 1.

4 If the hexadecimal display increments past .3 but the screen remains blank, there may be a problem with the MMP40 card. Replace the MMP40 card and return to step 1.

5 If none of these steps succeeds in solving the problem, contact your Nortel support organization.

Terminal cables and setup

Procedure 16-3
Terminal cables and setup

1. Make sure the terminal is installed and configured as described in Appendix B of this manual.
2. If terminal was working previously, enter terminal setup and perform “Clear communications” then reset terminal.
3. If terminal was working previously, and printer is printing SEER reports, enter terminal setup and verify that terminal is not in controller print mode. Print mode should be “Normal Print Mode” for all terminals, except the HP700/32. For the HP700/32, enter terminal setup and set the user “Aux Mode” to OFF.
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.
5. Check all cable connections to terminal.
6. Replace cables and adaptors one at a time.
7. Check printer setup and status.

   Refer to Chapter 10 of this manual for the correct printer setup.
8. Clear any printer faults (out of paper, paper jam) and put printer on-line.
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. Disable LOCAL ECHO.
10. Check terminal primary port, using method described in terminal owner’s manual.
11. Add a null modem adaptor if one was not installed between Meridian Mail and the terminal. Remove the null modem adaptor if one was installed.
12. If all of the above tests are OK, and none of the replacements fixes the problem, replace the terminal.

Power problems

Procedure 16-4
Power problems

Before proceeding to the AC or DC section

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

If the problem is not fixed, refer to “DC system power problems” or “AC system power problems” as appropriate.

DC system power problems

Procedure 16-5
DC system power problems

1. Remove the front doors from all modules in the system.
2. If no LEDs are lit on any module, go to Procedure 16-6 and test the pedestal power supply.
3. If no LEDs are lit on any module above a certain module, go to Procedure 16-7 and test the power harness at the lowest module with no LEDs lit.
4. 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 Procedure 16-8 and test the DCEPS.

   Note: A side of a module which contains a power supply but no PCPs or disk drives will give a DCEPS failure indicator.

Procedure 16-6
Test the pedestal power supply

1. Verify main DC voltage by measuring for -48 V DC to -52 V DC.
   a. To measure this voltage, use a volt/ohm meter. Measure between each BAT terminal (0/1, 2/3) and the corresponding BATRTN terminal. See Figures 16-5 (NT7D67CA PDU) and Figure 16-6 (NT6D53AA PDU).
   b. If voltage measured is incorrect, suspect 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 Procedure 16-7 and test the power harness at the lowest module with no LEDs lit.

Figure 16-5
Universal DC pedestal, NT7D67CA

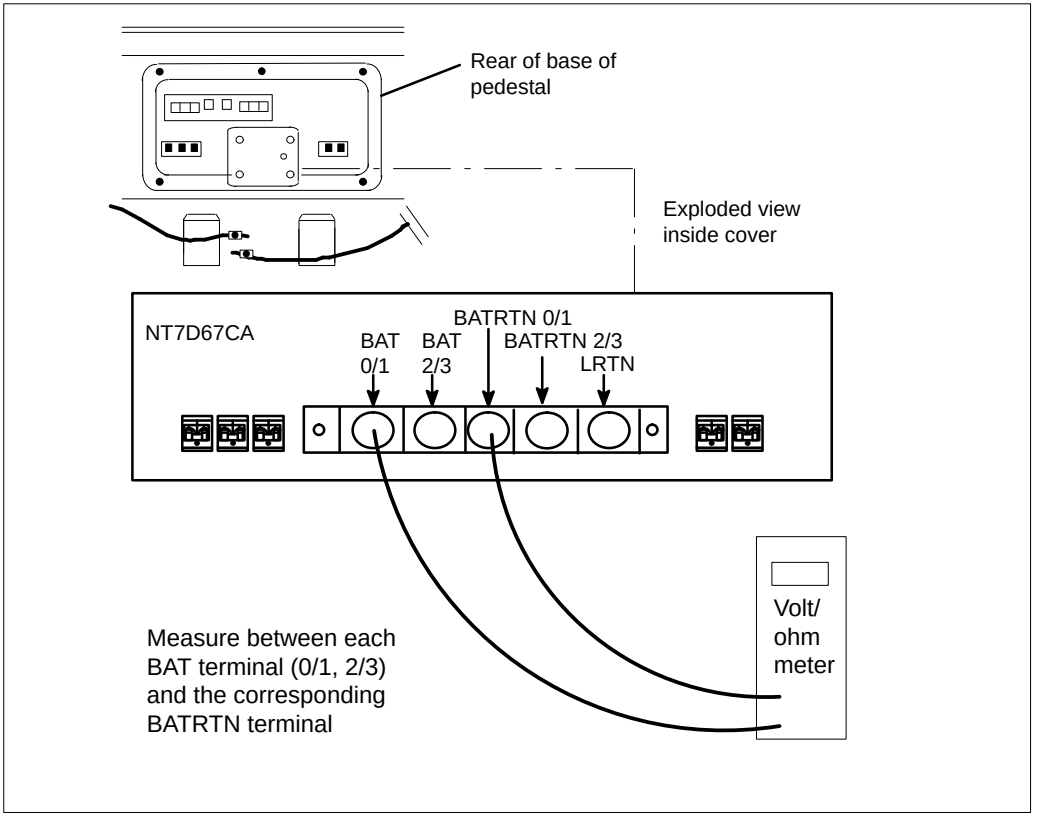
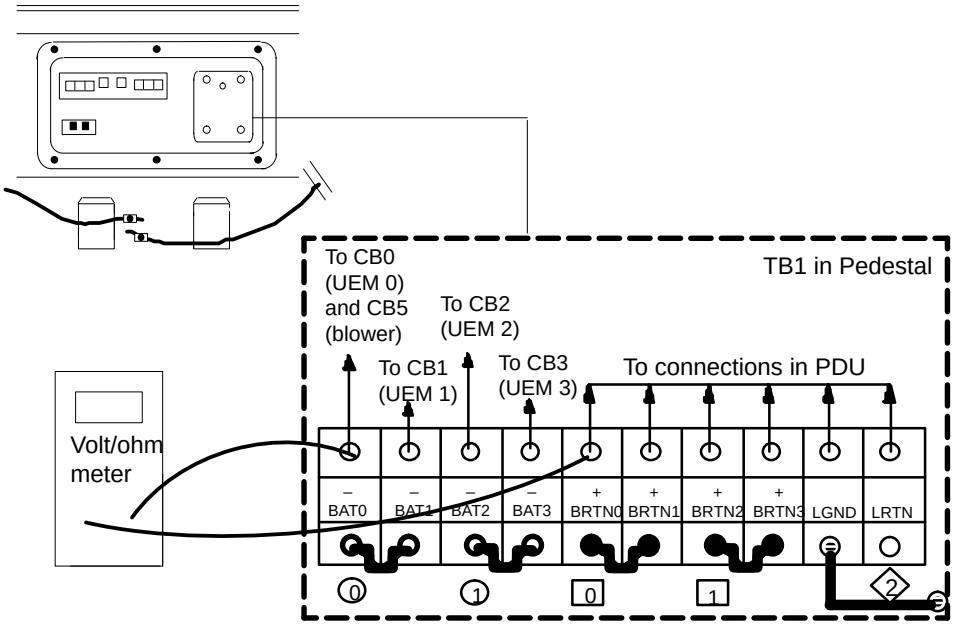


Figure 16-6
DC pedestal, NT6D53AA



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

Procedure 16-7
Test the power harness

1 Check DC voltage at DCEPS connectors (Figure 16-7).

a. Switch off both DCEPS on the module.

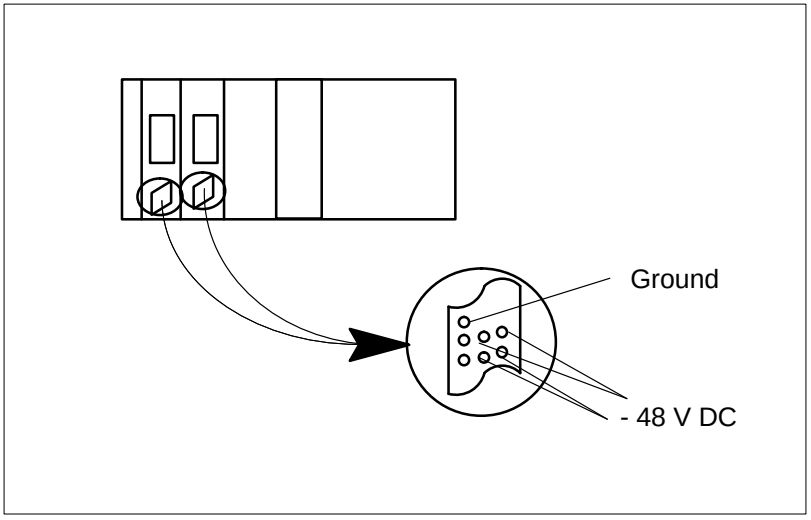
b. Remove both DCEPS.

c. Check the voltage at the pins shown in Figure 16-7.

d. If 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 voltage is correct, continue with Procedure 16-8, Test the DCEPS.

Figure 16-7
Front view of module, DCEPS or CEPS removed



Procedure 16-8
Test the DCEPS

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 system fails to boot, go to the section “System fails to boot completely” in this chapter.

AC system power problems

Procedure 16-9
AC system power problems

1. Remove the front doors from all modules in the system.
2. If no LEDs are lit on any module above a certain module, go to Procedure 16-10 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 Procedure 16-11 and test the CEPS.

Note: A side of a module which contains a power supply but no PCPs or disk drives will give a CEPS failure indicator.

Procedure 16-10
Test the power harness and pedestal power supply

1 Check AC voltage at CEPS connectors (Figure 16-8).

a. Switch off both breakers on the module.

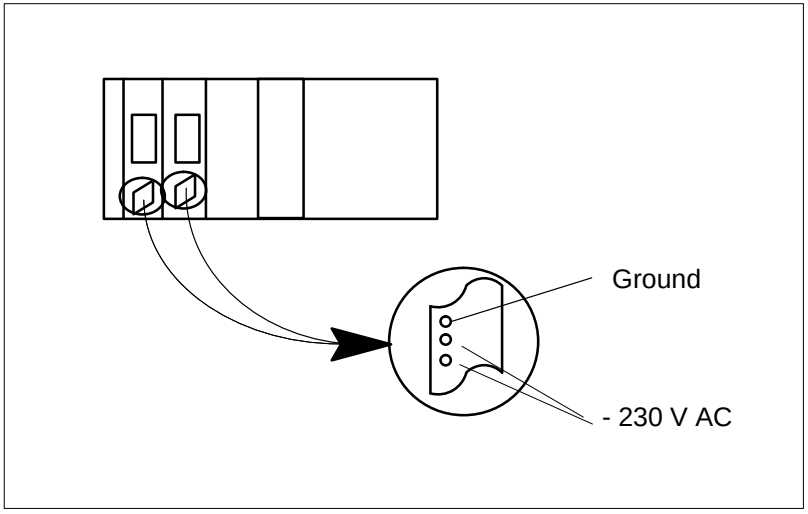
b. Remove both CEPS.

c. Check the voltage at the pins shown in Figure 16-8.

d. If voltage is incorrect, refer to *SL-1 Fault Clearing* (NTP 553-3001-510).

2 If voltage is correct, continue with Procedure 16-11, “Test the CEPS.”

Figure 16-8
Front view of module, CEPS removed.



Procedure 16-11
Test the CEPS

1. Power the module off using the shelf breakers, if it is not already off.
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 system fails to boot, go to the section “System fails to boot completely” later in this chapter.

System fails to boot completely

If the system stops during the process of booting up, refer to Table 16-3 to determine at which stage of the bootup the problem occurred. Determining the stage at which the boot process stopped will help in identifying the cause of the problem.

Before proceeding to troubleshooting the bootup, you must verify that the problem is not with either simple cabling errors or the terminal. Check that

- PCP installation and cabling conforms to the guidelines in this manual (meaning there are no loose or improperly installed cards or cables)
- there are no problems with the terminal (refer to the procedures in the section entitled “Troubleshooting terminal problems” in this chapter)

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 Procedure 16-1.

Once you have determined the stage at which the system is stopping, refer to Table 16-5 to find which procedure to follow.

Table 16-5
Troubleshooting bootup stages

Stage	Procedure
1 or 2	16-12
3	16-13
4	16-14
5, 6, or 7	16-15
8	16-16
9	16-17
10	16-18
11	16-19
12	Check the SEERs output. Follow the actions suggested in the *Maintenance Messages (SEERS) Guide* (NTP 555-7001-510).

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

Procedure 16-12
Troubleshooting stage 1 or 2 bootup failure

If the terminal output stopped at stage 1 after the message “Time C tick OK”, but before the message “Enabling Instruction Cache”, or in stage 2 during the “BTGA tests...”, then proceed as follows:

1. Replace the Utility card.
2. Replace the MMP40 card.
3. Check for Meridian Mail power problems as described in Procedures 16-4 to 16-8.
4. Verify that all cards in the system are properly seated.

If the terminal output has stopped at some other point in stage 1 or 2, then

1. Replace the MMP40 card.
2. Check for Meridian Mail power problems as described in Procedures 16-4 to 16-8 (DC system) or 16-4 and 16-9. to 16-11 (AC system).
3. Replace the Utility card.

Procedure 16-13
Troubleshooting stage 3 bootup failure—disk subsystem check

Failure during this stage of bootup could indicate problems with the SCSI subsystem. Proceed as follows:

1. Ensure that an incorrect Install/Data tape has not been mistakenly left in the tape drive.
2. Check the SCSI device jumper settings. Refer to the tape drive and disk drive figures in Chapter 7 of this manual.
3. Check the tape drive and each disk drive to ensure that the SCSI cable and power cable between the drive and the backplane connector are secure.
4. Check the voltage to disk and tape (+5 V, +12 V).
5. If on a non-prime node, replace the MMP40 board.
6. Replace the disk as described in Chapter 7 of this manual.

Procedure 16-14
Troubleshooting stage 4 bootup failure

If the bootup fails at this point, it could indicate that the system can initialize the SCSI disk but not boot from it. Proceed as follows:

1. Perform the checks in Procedure 16-13.
2. Check that the SCSI devices are unterminated as described in Chapter 7 of this manual.
3. Check that the tape drive is unterminated as described in Chapter 7 of this manual.
4. If the bootup display shows error messages such as “bus error”, this can indicate a serious problem with the SCSI disk. Contact your Nortel support organization.

Procedure 16-15
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. If the bootup fails at this point, it could indicate that the Mail programs have been read incorrectly from the disk, or the actual program on the disk is incorrect or corrupted. Proceed as follows:

1. Attempt to reboot the system.

   If the problem persists (in other words the bootup fails at the same point), this could indicate a serious problem with the SCSI disk.

2 Contact your Nortel support organization.

Procedure 16-16
Troubleshooting stage 8 bootup failure

1 Check the terminal output during this stage.

2 If there is indication that the PRM failed to load, contact your Nortel support organization.

Procedure 16-17
Troubleshooting stage 9 bootup failure

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. See Procedures 16-4 and16-8 (DC system) or 16-4 and 16-11 (AC system).

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 MMP40 cards of the affected nodes.

5 If the problem occurs on all the remote nodes, perform the system bus diagnostics (Procedure 16-21).

Procedure 16-18
Troubleshooting stage 10 bootup failure

This stage should normally take approximately five minutes. However, on a multi-node system, if a remote node is having problems booting up, then this state can take as long as 20 minutes. Proceed as follows:

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, power down and up to reset the system.

3 If the problem persists, replace the MMP40 cards of the affected nodes.

4 If the problem is occurring on all nodes, follow Procedure 16-21, “System bus diagnostics.”

Procedure 16-19
Troubleshooting stage 11 bootup failure

If the bootup fails during this stage

1. Check the SEERS for problems when loading programs. If any such SEERs are observed, then 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 support organization.
3. If Node 1 is InService, but the system will not progress past stage 10, then
   a. Replace the MMP40 card in Node 1.
   b. Check for Meridian Mail power problems as described in Procedures 16-4 to 16-8 (DC system) or 16-4 and 16-11 (AC system).
   c. If the problem is occurring on all nodes then follow Procedure 16-21, “System bus diagnostics.”

Disk subsystem check

Procedure 16-20
Checking the disk subsystem

1. Power down the system.
2. Remove the suspected faulty disk drive.
3. Check that the SCSI cable and power cable between the drive and the backplane connector are secure. Refer to the tape drive and disk drive figures in Chapter 7 of this manual. Refer to the “Hardware maintenance” chapter of this manual for SCSI cable and power locations.
4. Check the backplane DIP switch settings. Refer to Chapter 8 for correct backplane switch settings.
5. Replace disk.
6. Reboot the system and perform a restore (for non-shadowed systems) as described in *System Installation and Modification Guide* (NTP 555-7001-215) or disk sync (for shadowed systems).

System bus diagnostics

Before proceeding to troubleshooting the bootup, you must verify that the problem is not with either simple cabling errors or the terminal. Check that

- PCP installation and cabling conforms to the guidelines in chapters 8 and 9 (meaning there are no loose or improperly installed cards or cables)
- there are no problems with the terminal (refer to the procedures in the section entitled “Troubleshooting terminal problems” in this chapter)

The Meridian Mail system bus is controlled by the utility card located in node 1 of a multinode system. A fault on the system bus can cause all communication between nodes to be lost. If a system bus problem is suspected, follow the steps outlined in Procedure 16-21.

Procedure 16-21
System bus diagnostics

1. Check the backplane switch settings for all modules. Refer to Chapter 8 for correct backplane switch settings.
2. If the utility card diagnostics were on node 1, ensure that the diagnostics passed. If they did not pass, replace the utility card.
3. Verify the cabling between shelves is correct and secure.
4. Verify that all cards in the system are properly seated.
5. Observe the BootROM output on node 1 terminal.
   a. If the ”Utility Card Check OK” message and/or the BTGA tests do not appear in the BootROM messages, replace the utility card.
6. If the problem persists, replace the MMP40 card.
7. Power on the system.

Hardware diagnostics

A sanity check of the hardware is performed during the bootup sequence. The hardware diagnostics check:

- for the presence of volumes on existing nodes
- if disks and required hardware are present
- all hardware passes the diagnostics.

Utility card diagnostics

Utility card diagnostics are run on each utility card in the system. The diagnostics check the health of the Meridian Mail system bus controller, the utility card ports, and the real time clock. A utility card diagnostic failure is reported in a class 64 SEER. The SEER text will indicate the general nature of the problem. A description of class 64 SEERs can be found in *Meridian Mail Maintenance Message (SEERs)* (NTP 555-7001-510).

Voice processor card diagnostics

After the overlays are loaded on each node, voice processor diagnostics are run for each VP card that is present in the node. The diagnostics are run before the voice-base software is started on each channel.

The VP diagnostics check each of the DSPs on the card under test. If a problem is detected on the card, then a SEER is printed by the diagnostics and the DSP with the problem is marked faulty. If all DSPs on the card appear faulty, the card will also be marked faulty. Each DSP services two voice channels, so two faulty voice channels will be seen on the administration voice channel status screen for each faulty DSP that is detected.

The voice channels on a faulty DSP will not be brought into service as the node boots.

When a voice port has been marked faulty, it cannot be brought into service until out-of-service diagnostics have been run on the voice card and they have passed. Refer to Procedure 17-7.

The VP diagnostics issue class 53 SEERs. The SEER text will indicate the general nature of the problem. A description of class 53 SEERs can be found in *Meridian Mail Maintenance Message (SEERs)* (NTP 555-7001-510).

SCSI subsystem problems

Refer to Chapter 18 “Hardware maintenance” and Chapter 19 “Common disk subsystem problems” in this manual for SCSI troubleshooting.

Disk problems on node 1 may prevent the node from booting. Disk problems on non-prime nodes will not normally prevent the node from booting because the O/S is loaded from the prime node. Problems with non-prime node disks or SCSI subsystems will be reported through SEERs.

Chapter 17: Troubleshooting operational problems

This chapter contains troubleshooting information for any problem that occurs 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.

Table 17-1
Troubleshooting operational problems

–continued–

Table 17-1
Troubleshooting operational problems

System-level problems

Procedure 17-1

System is running then goes down

The system is running normally and then goes down for no apparent reason.

1. Check the SEER printouts.

   SEERs indicate a combination of problems (that is, more than one SEER is printed). If the system goes down as a result of a CEPS or CPU cardproblem, the SEERS will indicate the OFS program crashing.

2. Power the system off, wait about 90 seconds, then power on again.
3. Observe the diagnostic messages that generate (from BootROM) on the administration terminal.

4 If you suspect that the system is experiencing a startup problem, determine which stage the startup is stopping at.

a. Follow the procedure in Table 16-5 corresponding to failed startup stage.

5 If the system reboots with no hardware faults but remains out of service, refer to the SEERs to identify operational problems.

Procedure 17-2
System status remains "Faulty"

The administration terminal indicates that the system status is Faulty despite a successful bootup. If the Faulty status occurs during bootup, refer to Chapter 16.

1 Check SEER printout for related messages.

a. Take action appropriate for the SEER message as described in Meridian Mail Maintenance Messages (NTP 555-7001-510).

If 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 card, then the Utility card, or both the voice processor card and the Utility card.

2 Courtesy down the system, then activate system. Refer to the *System Administration Guide* for instructions on how to courtesy down and reactivate 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.

4 Verify correct database programming for the MSDL/ESDI dataport in the Meridian Mail.

Refer to Chapters 12 for details on programming and checking the ESDI/MSDL dataport.

5 Replace the following, one at a time: MMP40 card, Utility cards, and any filter connectors.

6 Determine if any nodes show Faulty or OutOfService status.

If any nodes do show Faulty or OutOfService status:

- ensure that all cards and disk drives are properly seated
- refer to the "System fails to boot completely" section in Chapter 16
- check for a disk subsystem problem (Chapter 16 and 19)

- check if Meridian Mail is communicating with SCSI address 0, 1, or 2 (Chapter 19)

7 Determine if any of the voice cards show Faulty or OutOfService status.

If a voice card shows Faulty or OutOfService status:

a. Disable the card. For detailed instructions on disabling the card, refer to the *System Administration Guide.*

b. Perform out-of-service diagnostics as described in the *System Administration Guide* (NTP 555-7001-30x).

c. Reenable the card.

d. If the card fails out-of-service diagnostics, or remains faulty, replace the card.

Procedure 17-3
Meridian Mail service is unavailable

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.

1 Verify that the Meridian Mail DN is properly configured in the VSDN table.See the *System Administration Guide* for configuration details.

2 Check that the AML link is up on the Meridian 1. See the section entitled " AML link problems", later in this chapter, for more information.

3 Verify that the primary DN in the Meridian Mail Channel Allocation Table (CAT) matches the Main ACD Queue DN in the Meridian 1.

4 Make sure the VASID in the Main ACD Queue DN matches the VASID in the Meridian 1 Configuration Record.

5 Verify that each service enabled on your system has the appropriate greeting and menu choices greeting recorded.

6 Verify that each Time of Day controller, Menu Service, Thru Dial, and Announcement Service has the correct service ID.

7 Check SEERs for any operational problems.

AML link problems

The AML 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 a "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.

The following types of error messages are generated on the Meridian 1 maintenance TTY:

- CSA xxx AML alarm messages
- ESDA xxx ESDI/MSDL failure messages
- 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.

Refer to the appropriate section for the type of error message that appears on the TTY.

Hardware-related problems

Check the status of the hardware by doing the following:

- Examine SEER messages
- Examine cable connections between the ESDI/MSDL card and the Meridian Mail MMP40 RS-232 connector.
- Examine 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. See Chapter 11 for details.
- If AML cabling uses the Meridian Mail and Meridian 1 input/output panels, bypass intra-cabinet cabling by connecting the AML cable directly from the ESDI/MSDL card to the J3 connector on the Meridian Mail backplane.
- Replace the ESDI/MSDL card.
- Replace the MMP40 card.
- Verify that the Meridian 1 has the correct ROM card(s). See Chapter 12 for details.

Verify that the Meridian 1 has the correct software options for the AML application.

Link maintenance

Control of the AML is the responsibility of the Meridian 1. There are two main forms of AML maintenance:

- the Overlay 48 program. The overlay 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 maintenance program. The maintenance program monitors and controls AML operation. The program evaluates the condition of the link and takes the appropriate action (e.g., enable, disable). These actions are based on information received from the following software components:

  — ESDI/MSDL maintenance software

  — AML polling program

  — AML maintenance overlay program 48

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 recovery

Any of the following events may cause an interruption of the AML 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 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 messages are 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 link status

The AML commands used to determine the link status or to place the link in a state will vary depending on the software release of X11 and I/O card type used.

X11 Release 17 or earlier	**X11 Release 18 or later**
ENL ESDI n	use: ENL AML n LYR2
DIS ESDI n	use: DIS AML n LYR2
ENL CMS n	use: ENL AML n LYR7
DIS CMS n	use: DIS AML n LYR7
CON ESDI n	use: EST AML n LYR2
DSC ESDI n	use: RLS AML n LYR2
ACMS n	use: ENL AML n ACMS use: ENL AML n AUTO (MSDL)
SLFT ESDI n	use: SLFT AML n
STAT CMS n	use: STAT AML n
STAT ESDI n	use: STAT AML n
SWCH CMS n n	use: SWCH AML n n

ESDI/AML states

An ESDI/AML port may be in one of the states shown in Table 17-2.

Table 17-2
ESDI/AML states

State	Description
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 applications. This state occurs during automatic recovery of the AML 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 Tables 17-3 and 17-4 include additional information, where

n = AML 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 NTP 553-2301-511.

Table 17-3
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.

Table 17-4
CSA error messages

CSA 001 n t x ISDN 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

Action: Replace the ESDI/MSDL

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.

Status and diagnostic commands

Use the following commands to determine the link status. The commands are shown using the following conventions:

- the top command, shown in bold, only applies to systems using an ESDI card and X11 software release 17 or earlier
- the bottom command, shown in bold, applies to systems using either an ESDI or MSDL card and X11 software release 18 or greater. If the command depends on the I/O card type, the command applicable to the ESDI is shown first and the command applicable to the MSDL is shown last.

  Note: For ESDI systems (regardless of X11's software release), the variable "**n**" represents the ESDI port number; whereas, for MSDL systems, the variable "**n**" represents the MSDL port number and AML link number.
- the first line of regular text describes the function of the command for an ESDI card (X11 software release 17 or earlier).
- the second line of regular text describes the function of the command for an ESDI card (X11 software release 18 or later)
- the third line of regular text describes the function of the command for an MSDL card (X11 software release 18 or later)

  Note: If the description of the command does not vary for the ESDI and MSLD card (using X11 Release 18 and greater) then the descriptions will be combined.

ACMS n
ENL AML n ACMS
ENL AML n AUTO
Automatic setup of the AML using ESDI/MSDL port number n. This command is equivalent to entering the following command sequences:

- ENL ESDI n or ENL AML n LYR2
- CON ESDI n or EST AML n LYR2
- ENL CMS n or ENL AML n LYR7

  Note: The ESDI/MSDL port must first be in the Disabled state.

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.

CON ESDI n
EST AML n LYR2
Set up the Link Layer (LAPB protocol) for the AML 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 link, the ENL CMS or ENL AML n LYR7 command must also be entered.

DIS ESDI n
DIS AML n LYR2
Disable ESDI/MSDL port number n. The link layer is disconnected and the ESDI/MSDL will not respond to far-end requests for link initialization. A warning message will appear if an attempt is made to disable the active AML link, but the link can be disabled, if desired.

DIS CMS n
DIS AML n LYR7
Disable AML 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, 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.

DSC ESDI n
RLS AML n LYR2
Disconnect the link layer and place the port in the enabled state. This command is applicable only when the port is in the connected state.

ENL CMS n
ENL AML n LYR7
Enable AML 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 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 5 seconds. If there is no response to the polling message, an error message is printed and no more polling messages are sent.

ENL ESDI n
ENL AML n LYR2
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 link is fully operational. See also the ACMS command.

SLFT ESDI n
SLFT AML n
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 CMS
STAT AML
Display the status of all AML links.

STAT CMS n
STAT AML n
Display the status of the AML link using ESDI/MSDL port n.

STAT ESDI
STAT AML n
Display the status of all ESDI/MSDL ports.

AML troubleshooting procedures

The procedures in this section describe how to correct problems with the link between the Meridian Mail Modular Option EC and the Meridian 1.

Procedure 17-4
System status shows "Faulty link to PBX"

1. Ensure that the AML cable is in place and secure.
2. Check that the Meridian 1 has been properly configured (refer to Chapter 12, "Configuring the Meridian 1").
3. Check other hardware addresses such as ESDI 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 are correct, 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 Selftest as outlined in Overlay 48. Refer to Chapter 12 for details.

   Note: The MSDL requires the selftest only.

   a. Disable the MSDL/ESDI port.

   b. Perform autosetup (ACMS) for the MSDL/ESDI port.
6. Check the PBX to make sure traffic is flowing by placing a phone call to Meridian Mail and watching the DSP Port Status screen that you can access from the Meridian Mail Logon screen.

Procedure 17-5
Testing ESDI ports (X11 Release 17 or earlier)

1. Enter **ENL ESDI *n*** to enable ESDI port n.
2. Ensure that the AML link 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.
3. Enter **SLFT ESDI *n*** to test ESDI port n.

   If the system response is other than OK, see the SL-1 Maintenance Manual (NTP553-2301-511) to analyze the message.
4. Enter **DIS ESDI *n*** to disable ESDI port n.

Procedure 17-6
Testing ESDI and MSDL ports (X11 Release 18 and later)

1 Enter **ENL AML *n* LYR2** to enable the AML n.

2 Enter **SLFT AML *n*** to test the AML n.

If the system response is other than OK, see the SL-1 maintenance practice (553-2301-511) to analyze the message.

3 Enter **DIS AML *n* LYR2** to disable AML n.

Voice card/channel problems

Note: "Voice card" used below refers to either a VP8 or a VP4.

Procedure 17-7
Channel status is "Faulty" or "OutOfService"

1 Check network loop cable connections along the network loop path between the backplane of Meridian Mail to the QPC414 in the Meridian 1.

2 Check all jumper blocks on the backplane to make sure they are secure. See Chapter 8, "Configuring the backplane and inspecting the printed circuit packs" for further information regarding the placement of all jumpers.

3 Ensure that the voice cards are installed in the correct nodes, and are properly seated.

4 Verify the database in Meridian 1 and the Channel Allocation Table (CAT) table.

5 Check for DTA100 code on the Meridian 1 console. Refer to the *X11 Input/Output Guide* (NTP 553-3001-400) for an explanation.

6 Check status of agents in Meridian 1 (in Overlay 32) on the Meridian 1 console.

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 DTA101 message if the agent was disabled.

Note 2: For any error messages received during this process, refer to *X11 Input/Output Guide* (NTP 553-3001-400) for appropriate action.

7 Disable each voice card and perform out-of-service diagnostics on each card. See your *System Administration Guide* for details. Re-enable each card. Replace the voice card, if necessary.

8 Check the SEER printout for any VSS load errors for that particular channel.

STAT L S C U

9 Check the SEER printout for any driver fault messages (software messages) for that channel. Refer to *Meridian Mail Maintenance Messages* (NTP 555-7001-510) manual for interpretation of these SEERs and take corrective measures.

If VPH complains about too many driver restarts for a particular channel, re-enable the channel online simply by disabling and then re-enabling that specific channel.

10 Review the SEERs and take appropriate action.

11 Replace the Utility card.

Procedure 17-8
Channel status remains "Loading"

1 Verify that each 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

4 Ensure that the Meridian 1 agents are enabled.

5 Ensure that the E-net or loop is enabled.

Procedure 17-9
Channel status "Idle", but cannot be acquired

1 Check the status of the channels.

2 Check SEER printout for messages related to that channel.

3 Take the appropriate action for that SEER.

4 Disable/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 Channel Allocation Table data entry.

Note: If these procedures are unsuccessful, record detailed information and contact your Northern Telecom support organization.

Silent channels

Procedure 17-10
Silent channel—calls have no voice and produce a SEER

1 Check the status of channels by placing a call and watching the status of the channel on the DSP Port Status screen. 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).

If the result shows the channel being acquired, the network loop path from Meridian Mail to the Meridian 1 is correct and secure.

If not, check SEER printout for any messages related to that channel, and take the appropriate action for that SEER.

2 Make sure that Meridian Mail has been configured with valid TNs and secondary DNs by checking the CAT table. If the TNs or DNs are incorrect for a particular card, follow steps 2a to 2d.

TN restriction formats:

Loop is double density only
shelf = 0 or 1
card = 2 or 3
unit = 0 to 7

a. Disable the card using the System Status and Maintenance function, as described in the *System Administration Guide*.

b. Log in to the TOOLS level. Select the “Modify hardware” tool and modify the TNs and DNs if necessary.

c. Change DNs in the CAT table.

d. Perform out-of-service diagnostics and re-enable the card.

3 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 553-3001-400).

4 Check the voice cards:

a. Disable and reseat the voice cards

b. Perform out-of-service diagnostics

c. Re-enable the voice cards

5 Check the QPC414 in the Meridian 1:

a. Disable and reseat the QPC414

b. Re-enable the QPC414

c. Initialize the Meridian 1

Note: This step will suspend call processing. Not recommended during peak business hours.

6 Replace the network loop cable.

7 Replace the voice card.

8 If these procedures are unsuccessful, contact your Northern Telecom support organization.

Procedure 17-11
Silent channel—calls have no voice or SEER response

1 Determine if ERR 3036 or ERR 3037 appeared on the Meridian 1 console. See *X11 Input/Output Guide* (553-3001-400) for an explanation of the error message.

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 Northern Telecom support organization.

Administration problems

Procedure 17-12
Cannot logon remotely

1 See “Troubleshooting terminal problems” section in Chapter 16.

2 Verify that the local administration terminal, printer, modem, and remote administration terminal are all set up correctly, according to Chapter 10.

Procedure 17-13
Logon unsuccessful on operational terminal

1 Check that you are entering the correct password.

2 Check that the timestamp has been issued.

a. Check the latest SEER for timestamp

b. Load Overlay 2 in the Meridian 1 and issue 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.

Procedure 17-14
Optional feature purchased but unavailable

1 Verify the installed features by checking the Display system record tool (accessible from the TOOLS level).

2 If the feature is not present, attempt to add the feature from the Install/data tape as described in the chapter ”Feature Expansion” in *System Installation and Modification Guide* (NTP 555-7001-215).

3 Check SEER printout for any incorrect data entries such as keycode number or serial number.

If the keycode is not correct, contact your Northern Telecom support organization to obtain the correct keycode.

4 Verify that the features were ordered correctly.

Procedure 17-15
Voice services submenu revert DN does not work

By default, submenus revert to their parent menu. To revert to a specific DN

1 Program the delayed response and initial no-response for the submenu as a calling function (CL) to the intended revert DN.

Procedure 17-16
System backups (disk to tape) do not complete properly

1 Ensure that you are using the correct tape for backup.

Not all tapes are appropriate for all system configurations. See the *System Administration Guide* for details.

Additional units can be purchased from your sales representative. If you do not receive tapes with a new system, report the problem to your 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 to take for that SEER.

3 Verify that the voltage is correct at the CEPS connectors. See Chapter 16.

4 Verify that all SCSI cable connections are secure.

5 Ensure that the tape drive is securely seated and is installed in the correct MSU slot. Refer to Chapter 7 for slot designations.

6 Replace the tape unit.

7 If the backup was unsuccessful, substitute a replacement tape drive and attempt the backup again.

Note: Verify the full or partial backup was successful before moving on to another task.

Procedure 17-17
System backups (disk to disk) do not complete properly

1 Examine SEER printouts for information on where the error is occurring. Consult the *Maintenance Messages (SERS) Guide* (NTP 555-7001-510) for each relevant SEER and the appropriate action to take for that SEER.

2 Verify that the voltage is correct at the CEPS connectors. See Chapter 16.

3 Verify that all SCSI cable connections are secure.

4 Ensure that the disk drive is securely seated and is installed in the correct MSU slot. Refer to Chapter 7 for slot designations.

5 If the backup was unsuccessful, substitute a replacement disk drive and attempt the backup again.

Note: Verify the full or partial backup was successful before moving on to another task.

User-reported problems

If a user node is shut down without being disabled first, for example, due to 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.

Procedure 17-18
Recover from “mailbox full ... mailbox empty”

1 Run “Audit all volumes” from the TOOLS menu (see *System Administration Tools*, NTP 555-7001-305) to correct the disk space usage information.

Note 1: If the problem is wide-spread or urgent, and the extra load on the system can be tolerated, run the audit immediately. If the problem is not wide-spread or urgent, run the audit during non-busy hours.

Note 2: If it is possible to keep the node out of service after it is restarted, run the audit before reenabling the node. This will avoid the reoccurrence of this problem.

Procedure 17-19
Message waiting indicator does not light up on any telephone sets

1. Verify that the Meridian Mail customer number in the “General Options” screen (under General Administration) matches the customer number on the Meridian 1.
   a. If they do not match, modify the Meridian Mail customer number in the general system configuration.
2. Ensure that all Meridian Mail users have Message Waiting Allowed class of service configured for their telephone sets.
3. Check user profile in user administration for Message Notification. Refer to the *System Administration Guide.*

Procedure 17-20
Message waiting indication is delayed

1. Ensure that the CSQI and CSQO parameters controlling message buffer size in the Meridian 1 are sufficient to handle the traffic. See Chapter 12 for the recommended parameter values. The Meridian 1 must be initialized after changing these parameters.
   a. If they are not, recalculate the registers.
2. Verify that the AML link is up. (See section entitled “AML (ISDN/AP) link problems” in this chapter for AML troubleshooting instructions).
3. Review the Meridian 1 history file for HDLC restarts or CSL outages which result in MWI messages being lost between Meridian Mail and the Meridian 1.
4. Increase 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 “Set MWI” utility from Tools level and verify all users receive MWI.
7. If an interrupted dial tone is used for MWI notification, ensure there are sufficient digitone receiver resources on the Meridian 1.

   Meridian 1 traffic reports can be used as a tool to verify insufficient DTR resources.

Procedure 17-21
Call Sender does not work for any calls

1. Verify that the Meridian Mail customer number in the “General Options” screen (under General Administration) matches the customer number on the Meridian 1.
   a. If they do not match, modify the Meridian Mail customer number in the general system configuration.
2. Verify that the Sender DN is valid and check any dialing restrictions that may apply.
3. Verify that the Meridian Mail ACD agents have Transfer (TRN) and Conference (A03) programmed on the correct keys (6 and 7, respectively).
   a. Check the configuration against the instructions given in Chapter 12.
4. Verify that all Meridian Mail users have a Conference (A03 or A06) key programmed for their telephone set.
5. Verify that the Meridian Mail Channel Allocation Table (CAT) was programmed correctly.
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 “Personal Verification Recorded” field.
   c. Press the [Voice] softkey.
   d. When the system prompts you for the DN, enter the Call Sender DN under test.
   e. If the call is unsuccessful, check the Meridian 1 and Meridian Mail databases for dialing restrictions.

Procedure 17-22
Revert DN does not work

1. Verify that the Meridian Mail ACD agents have Transfer (TRN) programmed on key 6.
   a. Check the configuration against the instructions given in 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.
   a. 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 "Personal Verification Recorded" field.

c. Press the [Voice] softkey.

d. When the system prompts you for the DN, enter the Call Sender DN under test.

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

Chapter 18: Hardware maintenance

This section provides the following maintenance procedures for the Modular Option EC:

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

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).

The PCPs and other components are susceptible to static damage. Wear a wrist strap connected to a grounding point. This precaution protects components against damage caused by static electricity.

Disk units are susceptible to damage from rough handling.

Power supply replacement

Procedure 18-1
Replacing the power supply unit

1. Shut off power to the Meridian Mail module using the circuit breakers (AC system) or DCEPS switches (DC system) shown in Figures 18-1 and 18-2.
2. Pull out the CEPS or DCEPS unit to be replaced.
3. Insert the replacement unit and lock it in place.
4. Prior to 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 circuit breakers or DCEPS switches.

   Note: Each CEPS provides power to half the module. The half-way point is between the two disk drives. The left CEPS powers the left half of the module, and the right CEPS powers the right side of the module.

Figure 18-1
Power division point for AC Modular Option EC

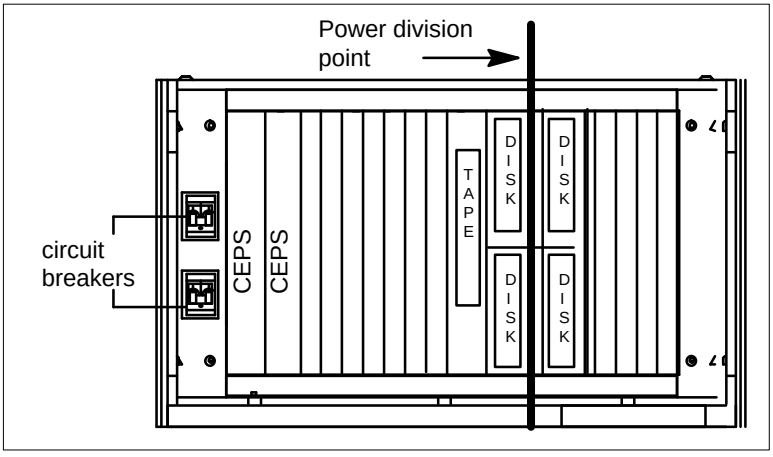
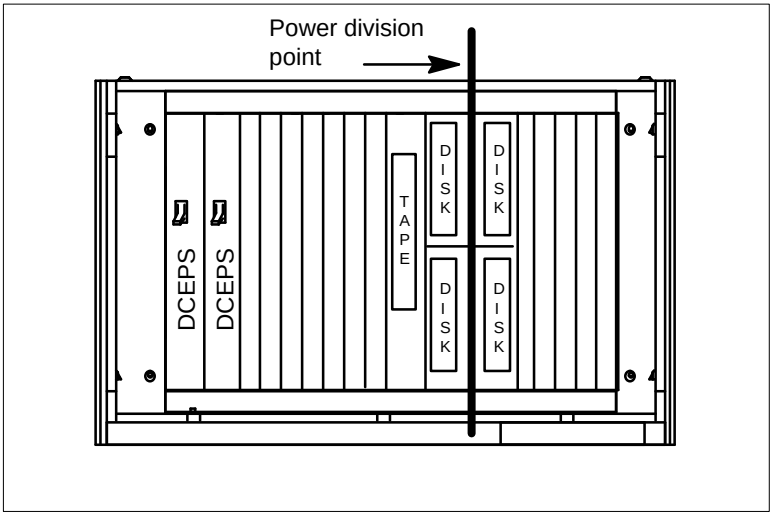


Figure 18-2
Power division point for DC Modular Option EC



Printed circuit packs (PCPs)

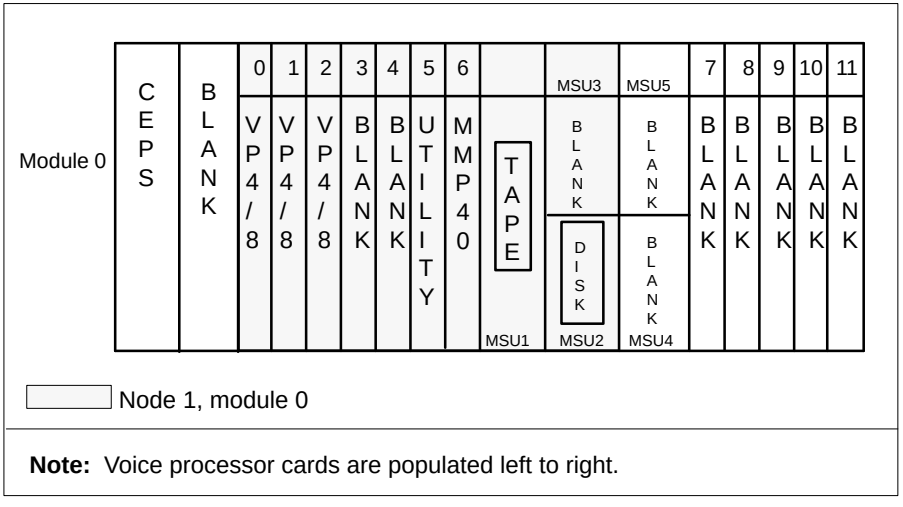
The following PCPs are used in Meridian Mail Modular Option EC:

- MMP40 card
- Utility card
- VP4 cards
- VP8 cards

The printed circuit pack slot designations for unshadowed systems are shown in Figures 18-3 to 18-7. Slot designations for shadowed systems are shown in Figures 18-8 to 18-12.

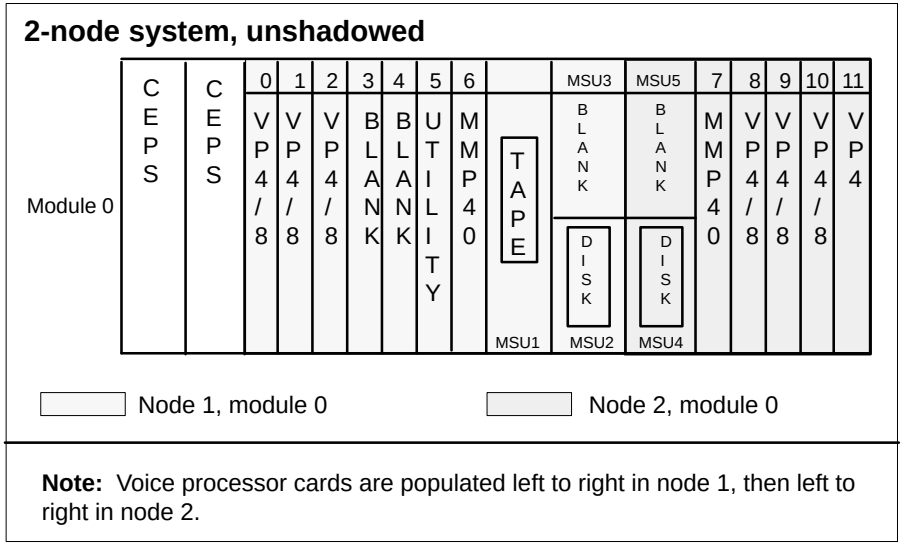
Slot allocations for unshadowed configurations

Figure 18-3
PCP slot allocations for 1-node unshadowed system



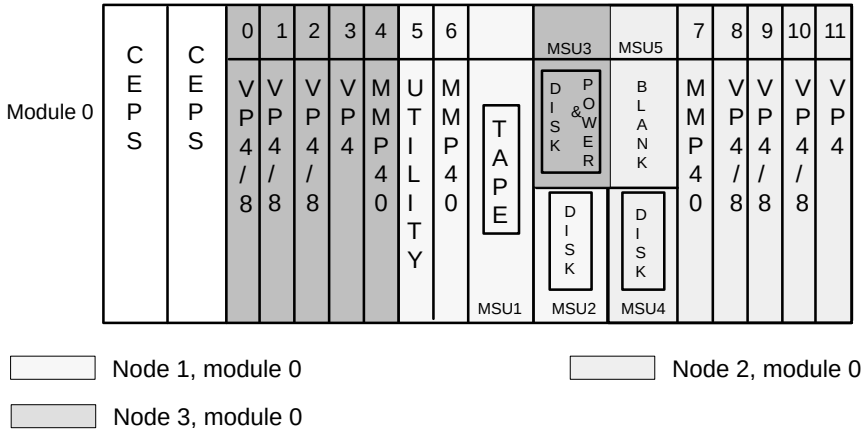
Note: Voice processor cards are populated left to right.

Figure 18-4
PCP slot allocations for 2-node unshadowed system



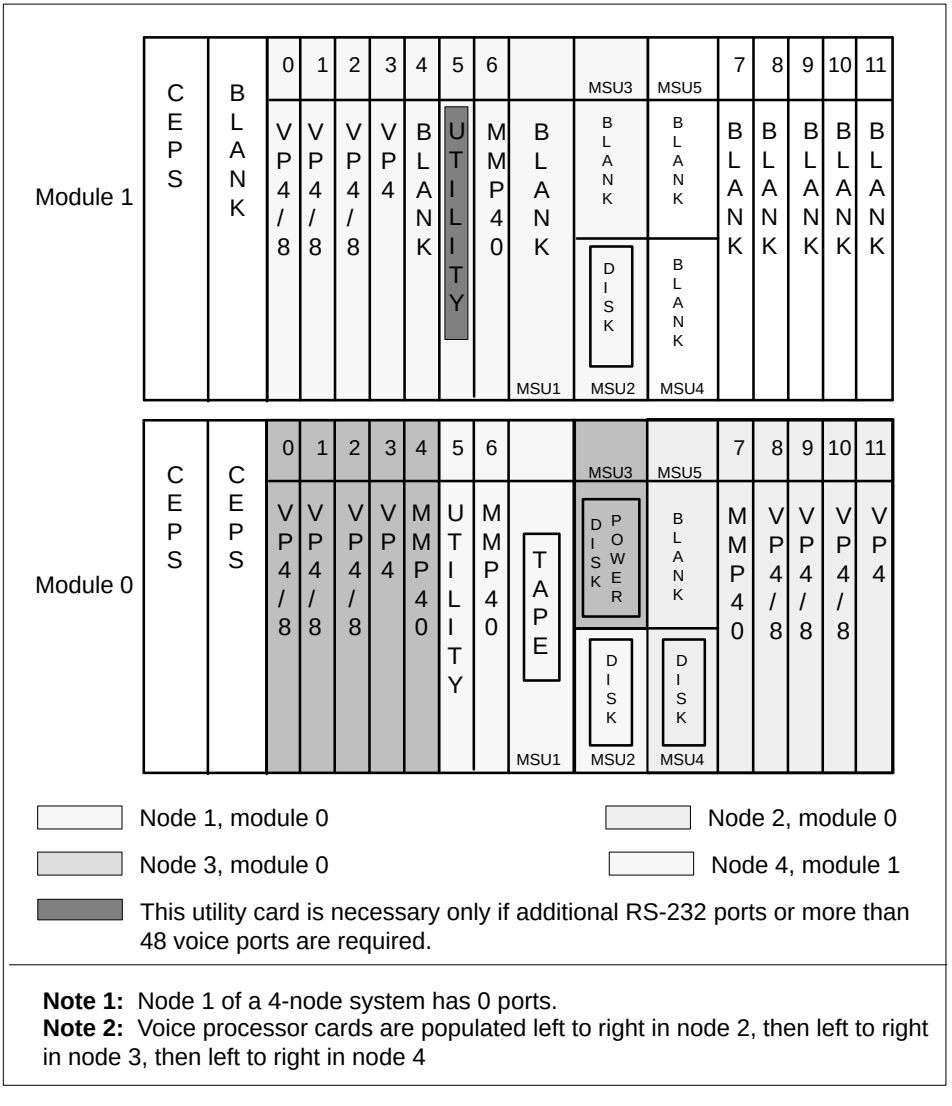
Note: Voice processor cards are populated left to right in node 1, then left to right in node 2.

Figure 18-5
PCP slot allocations for 3-node unshadowed system



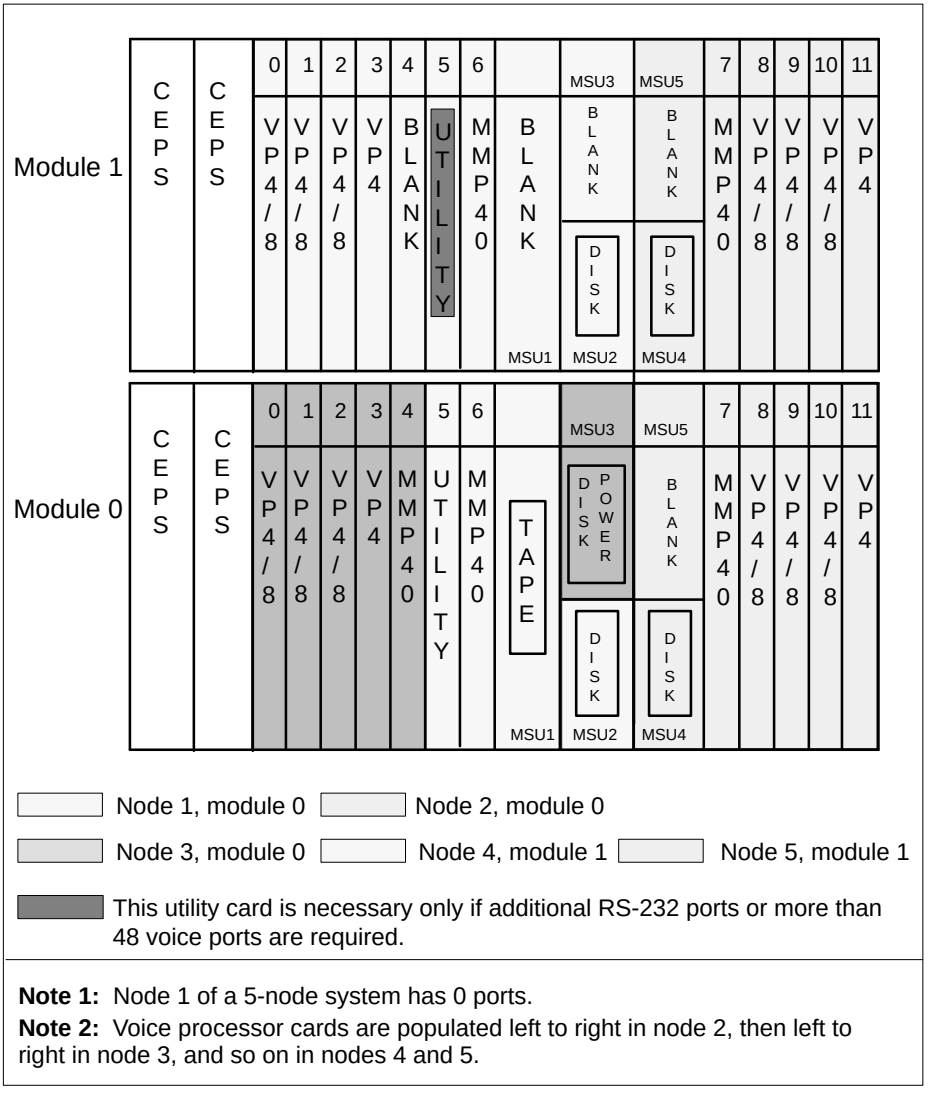
Note 1: Node 1 of a 3-node system has 0 (zero) ports.
Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3.

Figure 18-6
PCP slot allocations for 4-node unshadowed system



Note 1: Node 1 of a 4-node system has 0 ports.
Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3, then left to right in node 4

Figure 18-7
PCP slot allocations for 5-node unshadowed system



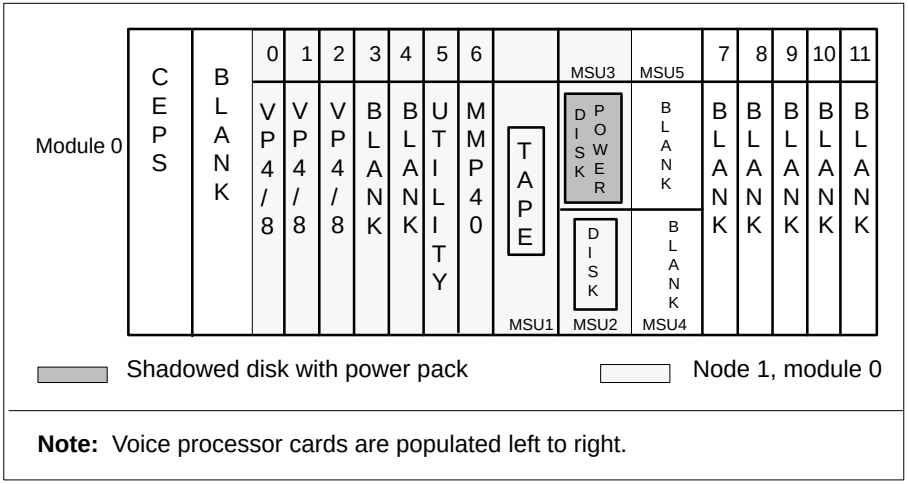
Note 1: Node 1 of a 5-node system has 0 ports.

Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3, and so on in nodes 4 and 5.

Slot allocations for shadowed configurations

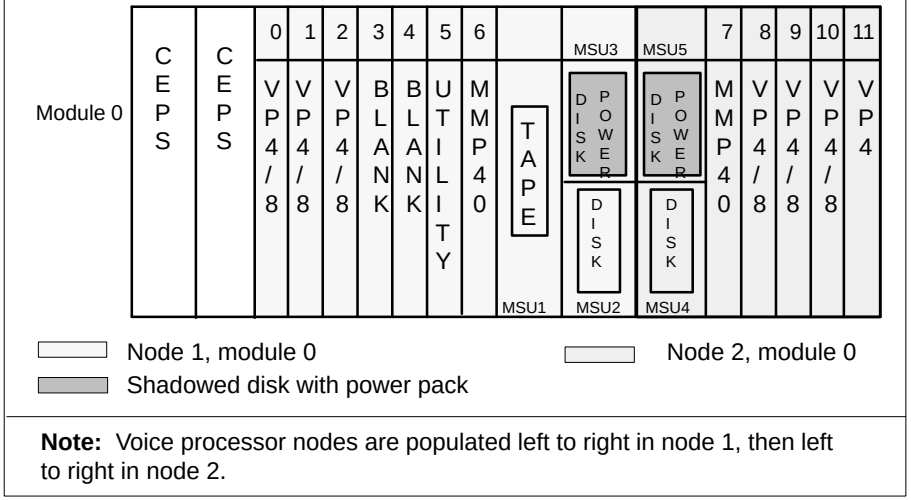
Note: The shadowed disk is above the particular node's prime disk.

Figure 18-8
PCP slot allocations for 1-node shadowed system



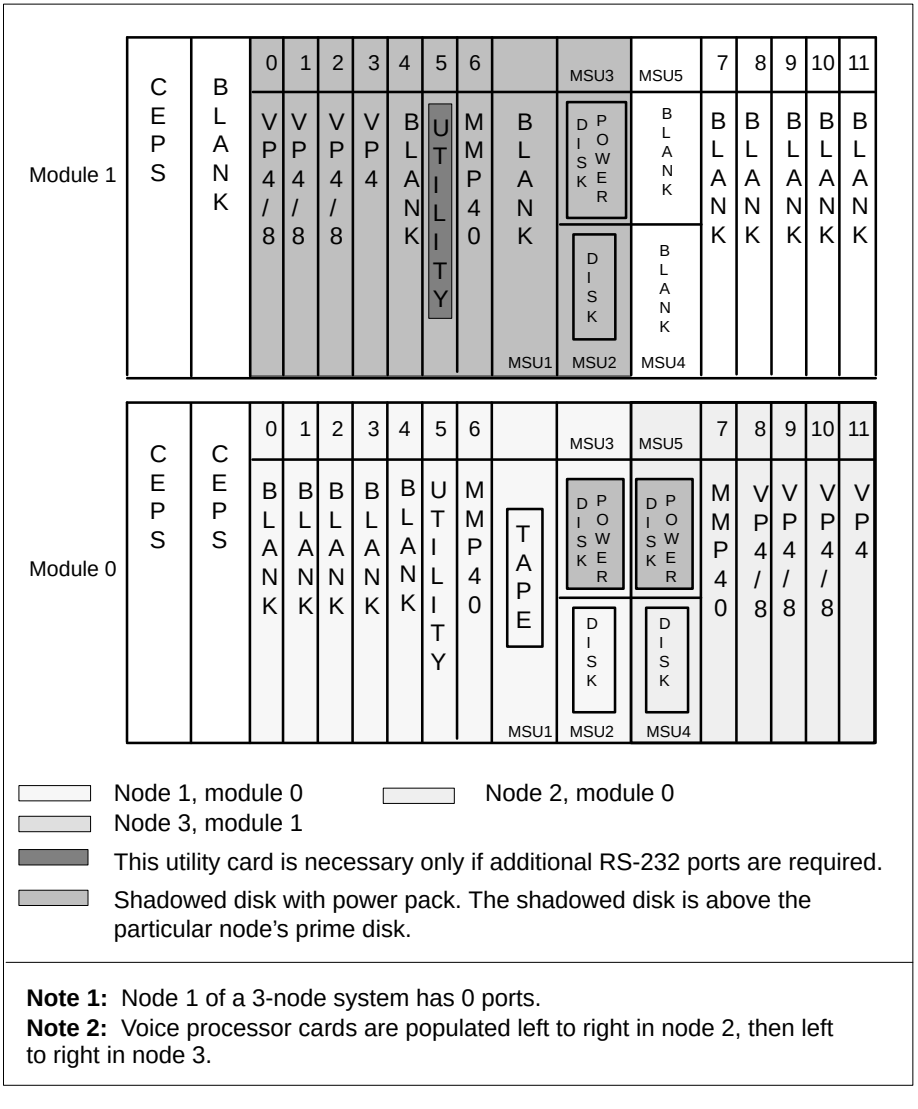
Note: Voice processor cards are populated left to right.

Figure 18-9
PCP slot allocations for 2-node shadowed system



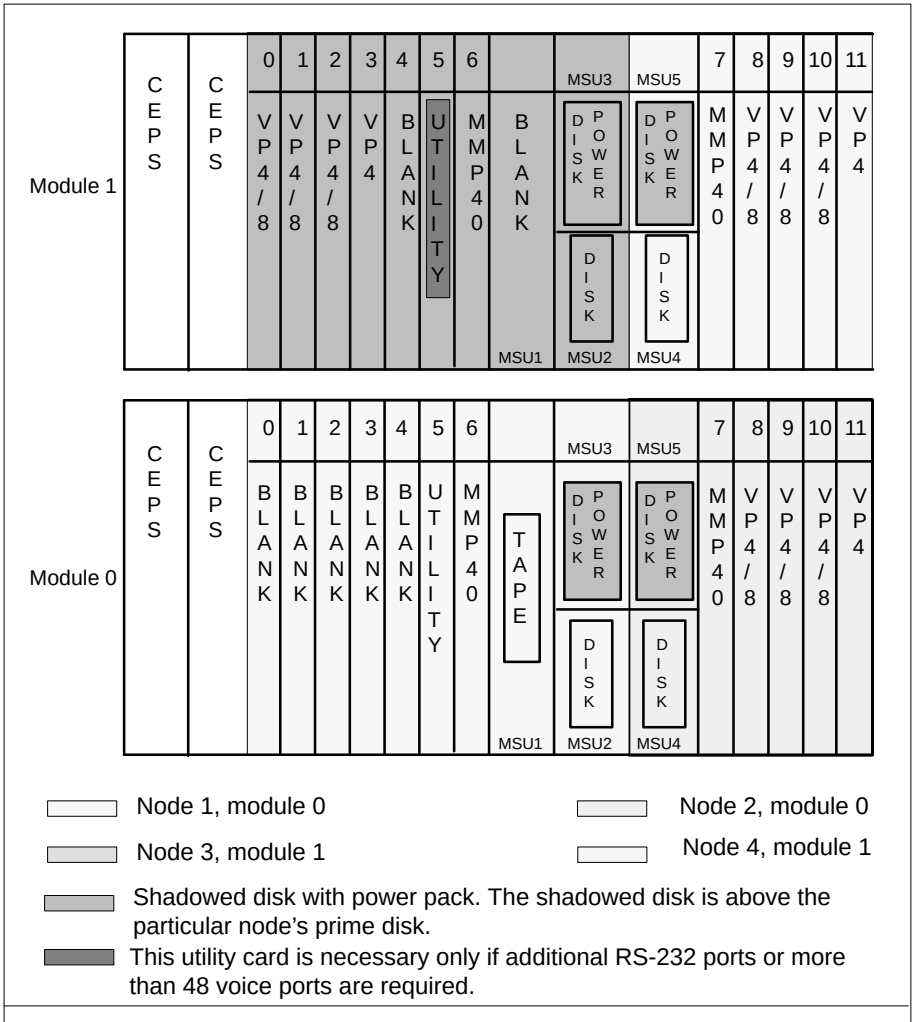
Note: Voice processor nodes are populated left to right in node 1, then left to right in node 2.

Figure 18-10
PCP slot allocations for 3-node shadowed system



Note 1: Node 1 of a 3-node system has 0 ports.
Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3.

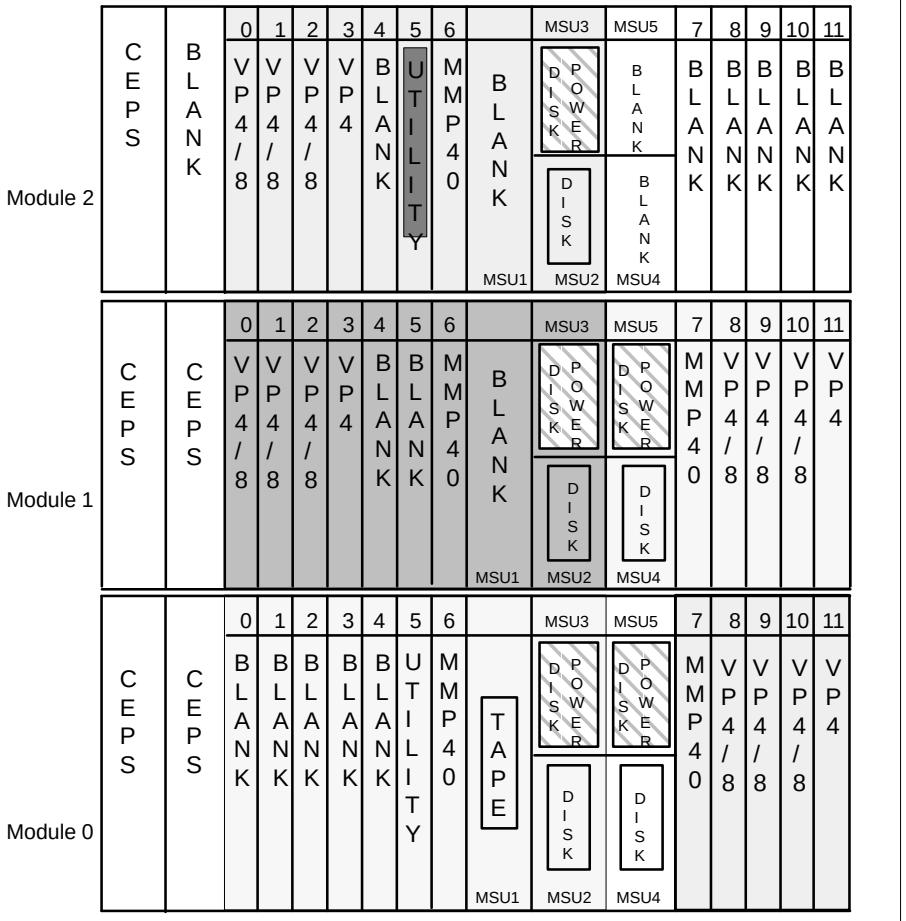
Figure 18-11
PCP slot allocations for 4-node shadowed system



Note 1: Node 1 of a 4-node system has 0 ports.

Note 2: Voice processor cards are populated left to right starting with node 2, then left to right in node 3, then left to right in node 4.

Figure 18-12
PCP slot allocations for 5-node shadowed system



Note 1: Node 1 of a 5-node system has 0 ports.

Note 2: Voice processor cards are populated left to right starting with node 2 then left to right in node 3, and so on in nodes 4 and 5.

PCP replacement

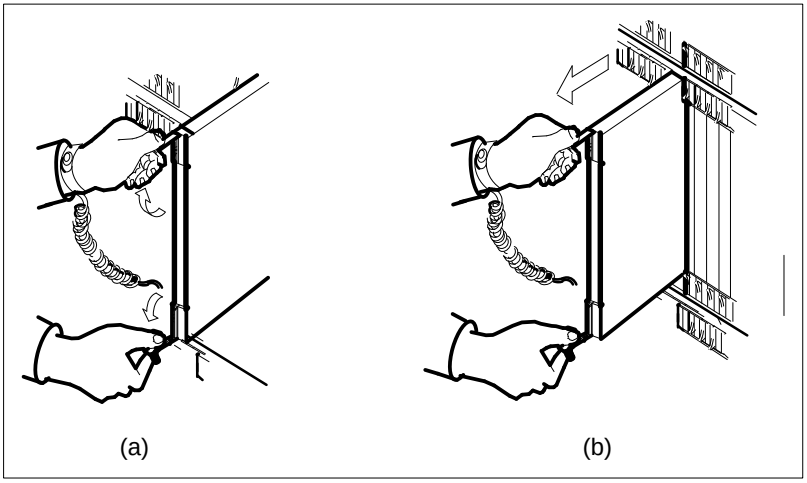
CAUTION
Risk of equipment damage
The circuit packs and disk drives are susceptible to static damage. Before handling circuit packs, wear an anti-static wrist strap.

Note: Only the voice processor cards are hot-pluggable. However, they must be disabled prior to removal. Use the "System Status and Maintenance" function from the system administration menu to disable voice cards.

Procedure 18-2
Replacing a card (PCP)

1. If you are replacing a voice card (VP4 or VP8) go to the Card Status screen under the System Status and Maintenance menu, and disable the card. If you are replacing any other type of card, courtesy down the system and power off the module.
2. Open the locking levers on the card and gently pull the card towards you until it clears the shelf. (See Figure 18-13).
3. Check the new card to make sure it has the same PEC number as the one you have removed.
4. Check the new card to make sure it is not bent and there are no loose parts.
5. If you are not installing the new card in the shelf immediately, place it in an electrostatic discharge (ESD) protective container.
6. Install the new card in the module by aligning it with the slots in the module (the locking levers are still open) and gently sliding the card back into the module.
7. Seat and lock the card:
   a. Using your fingers or thumbs, push on the upper and lower edges of the faceplate to ensure that the card is fully seated in the module.
   b. Close the locking levers.

Figure 18-13
Removal of a PCP



Disk unit replacement in an unshadowed system

The mass storage units for the Meridian Mail Modular Option EC system are listed in Table 18-1.

WARNING
Risk of electrical shock
Power off the Meridian Mail module before removing and replacing the disk unit.

CAUTION
Risk of equipment damage
Use extreme care when installing the disk unit, because it is extremely susceptible to damage as a result of rough or improper handling.

Table 18-1
Disk drives

Assembly number / Common product code	Title of assembly	Models	Individual disk drive CPC
NT6P06AA (A0391975)	300 Mbyte hard disk unit	Maxtor LXT340SY	A0351371
		Seagate ST1480N	–
		Seagate ST3390N	A0602257
NT6P07AA (A0391976)	1.0 Gbyte hard disk unit	Maxtor MXT1240	–
		Seagate ST11200	
		Seagate ST31230N	A0616792
		DEC DSP3105/3107	–
NT6P44AA (A0394781)	1.0 Gbyte disk with auxiliary power	Maxtor/Seagate disk drive with power unit	–
		DEC DSP3105/3107	A0383809
		Maxtor MXT1240S	
		Seagate ST11200	
		Seagate ST31230N	A0616792

Procedure 18-3
Replacing a disk in an unshadowed system

1. Loosen the screw on the faceplate that covers the disk drive/tape drive area, and slide the faceplate up and out.
2. Ensure that the disk drive has the same PEC, including suffix, as the one on the packing slip.
3. Ensure that the SCSI IDs are set to 0. To do this, check that all the SCSI address jumpers on the jumper pins have been removed. See Figures 18-14 to 18-20. (You may need to remove the brackets holding the disk drive.)

   Note: The disk units are labeled to show the node number for which they are configured. Be sure to check the number and install the disk into the correct node.
4. Ensure that all other settings (for example, parity) are correct. Refer to Figures 18-14 to 18-20.

5. Open the locking levers and align the card with the appropriate MSU slot in the module (refer to Figures 18-3 to 18-7 for disk slot locations within the node). Gently slide the card into the module, pushing on the upper and lower edges to ensure that the disk drive is fully seated in the module.
6. Close the locking levers.
7. Replace the faceplate.

Figure 18-14
Maxtor LXT340SY disk drive and jumper settings

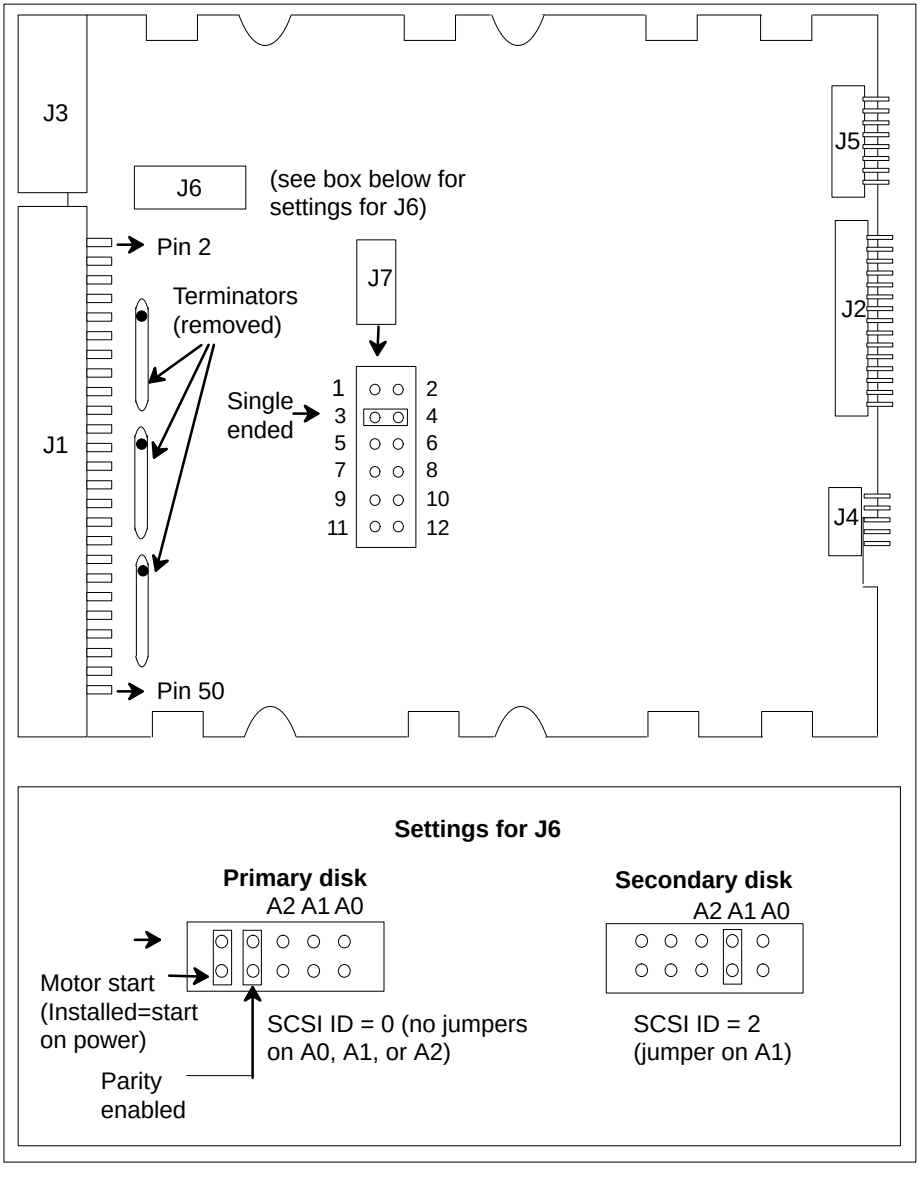


Figure 18-15
Seagate ST1480N disk drive and jumper settings

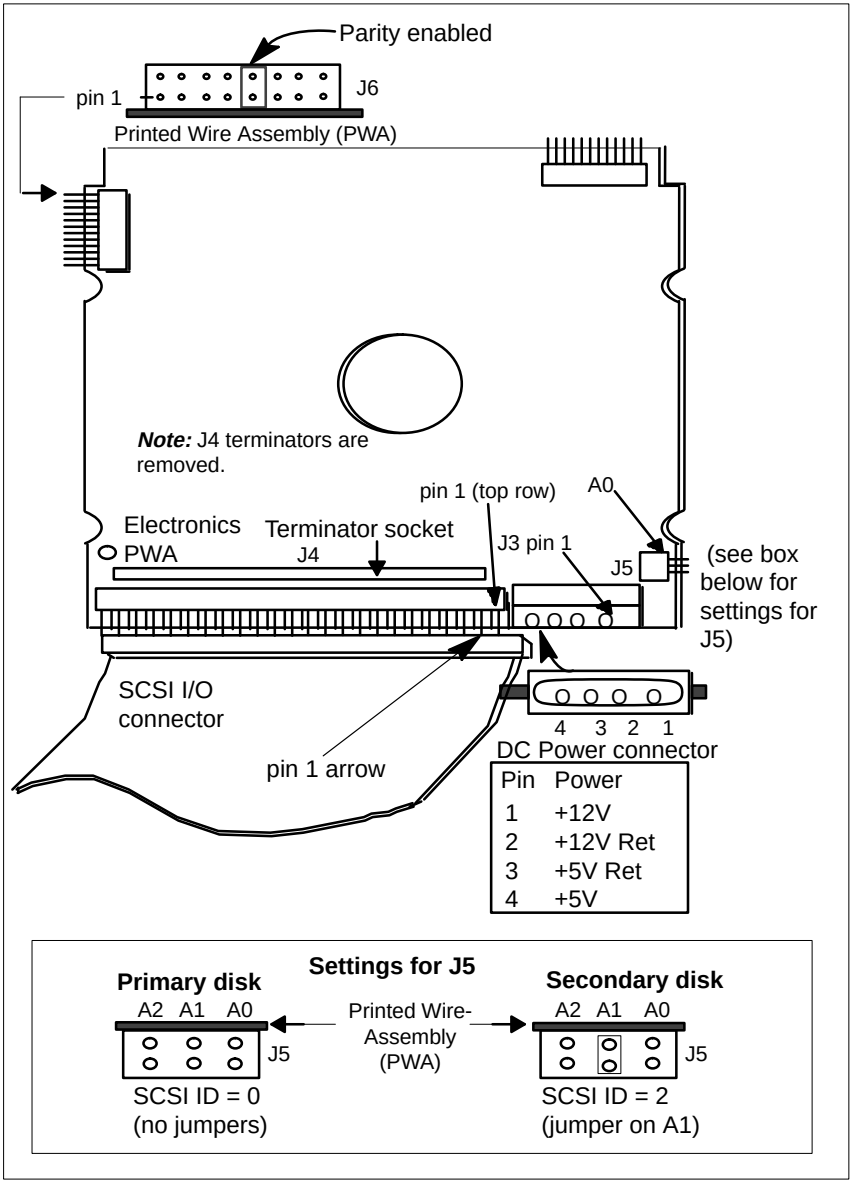


Figure 18-16
Seagate ST3390N disk drive and jumper settings

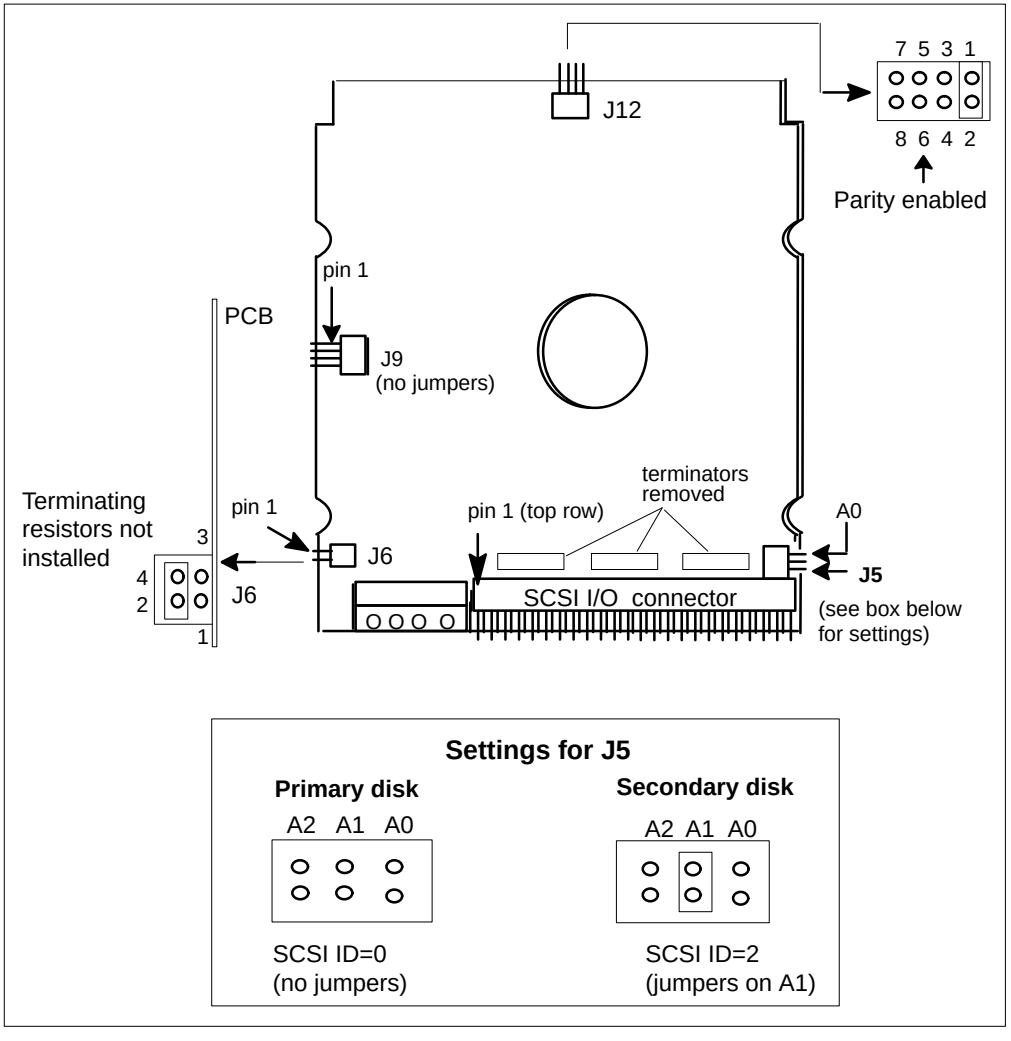


Figure 18-17
Maxtor MXT1240 disk drive and jumper settings

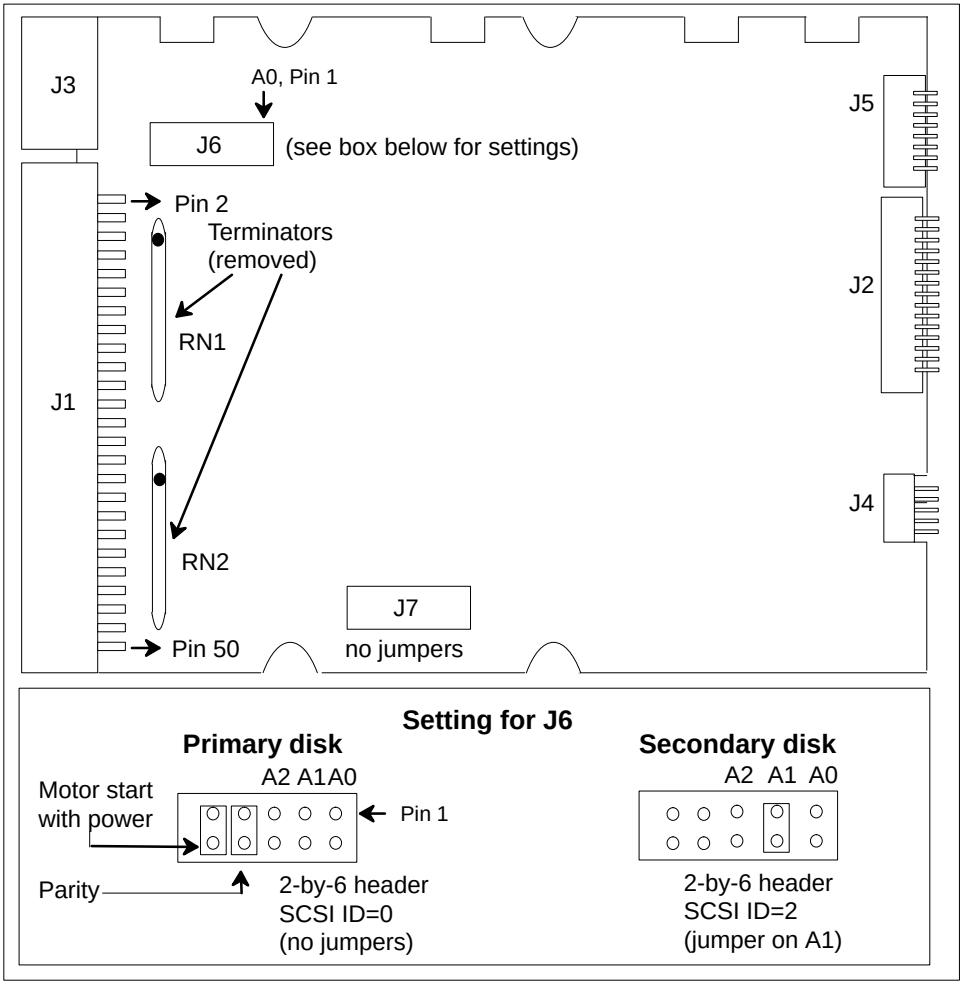
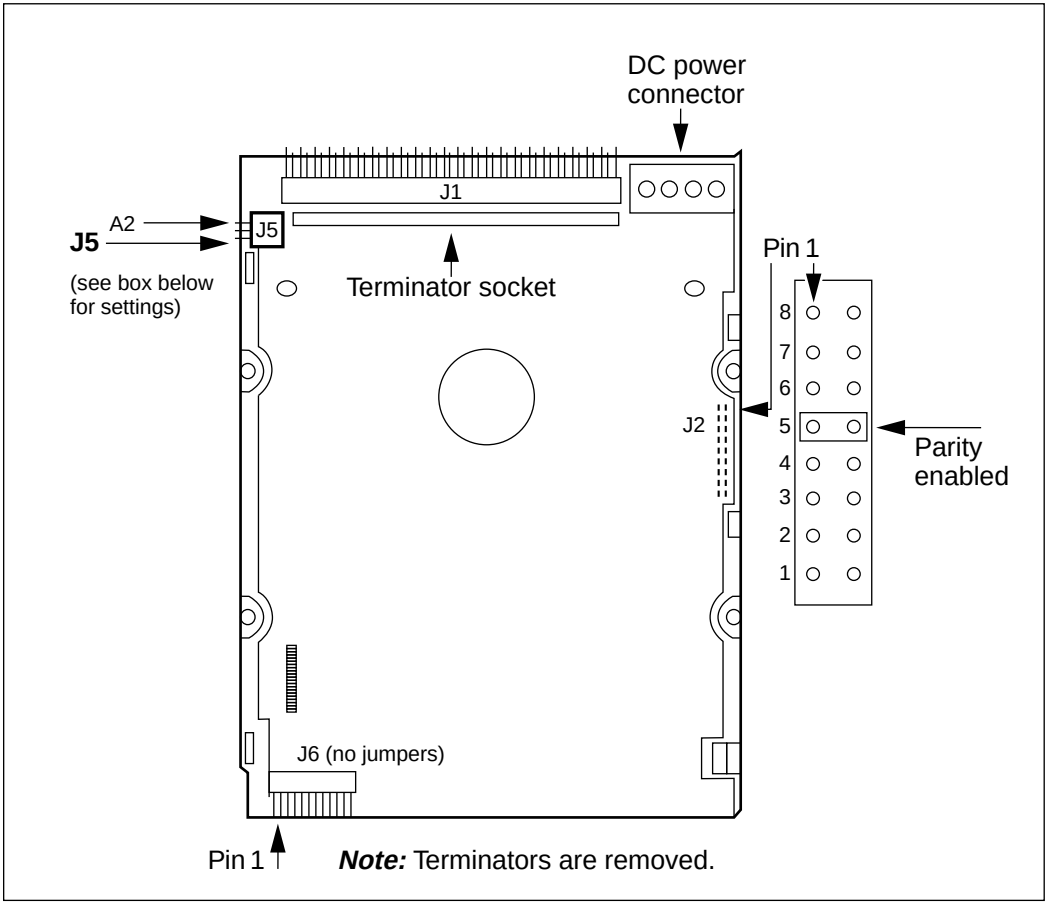
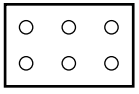


Figure 18-18
Seagate ST11200 disk drive and jumper settings



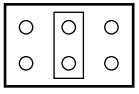
Settings for J5

Primary disk
A2 A1 A0



2-by-3 header
SCSI ID=0
(no jumpers)

Secondary disk
A2 A1 A0



2-by-3 header
SCSI ID=2
(jumper on A1)

Figure 18-19
DEC DSP3107L disk drive and jumper settings

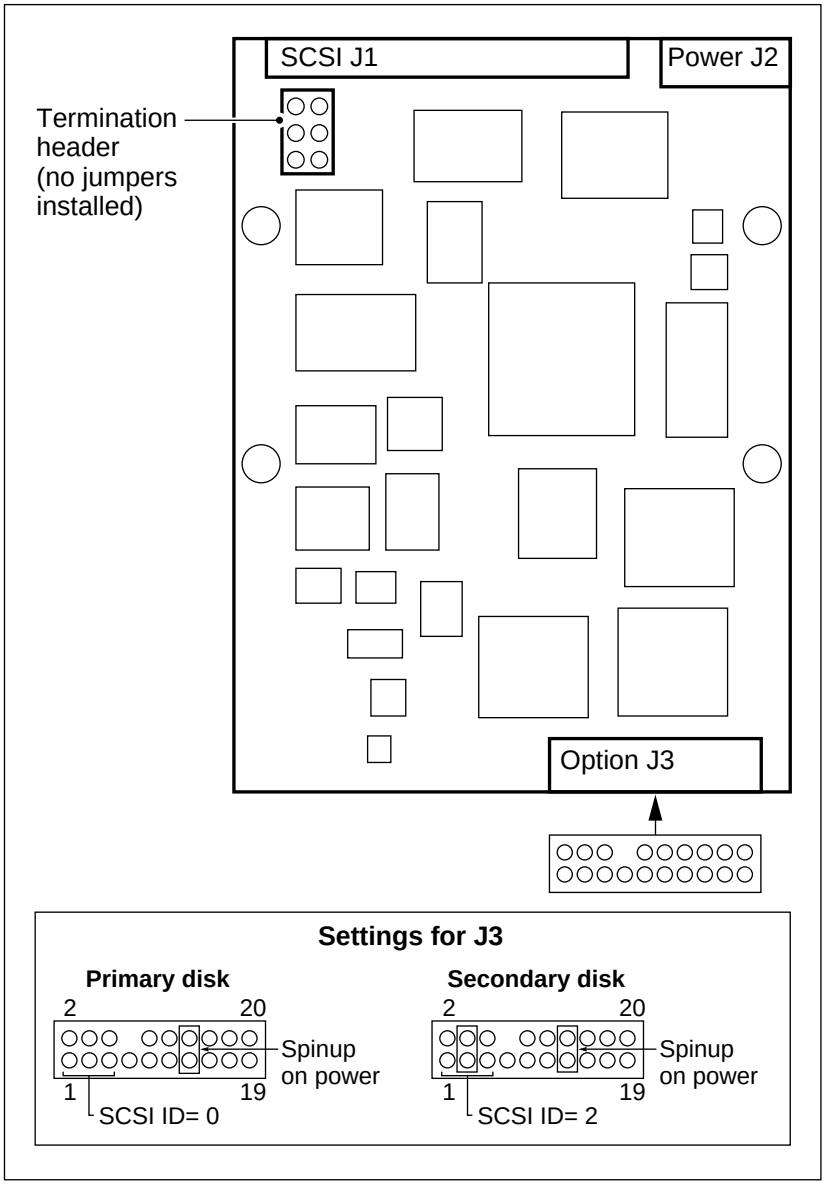
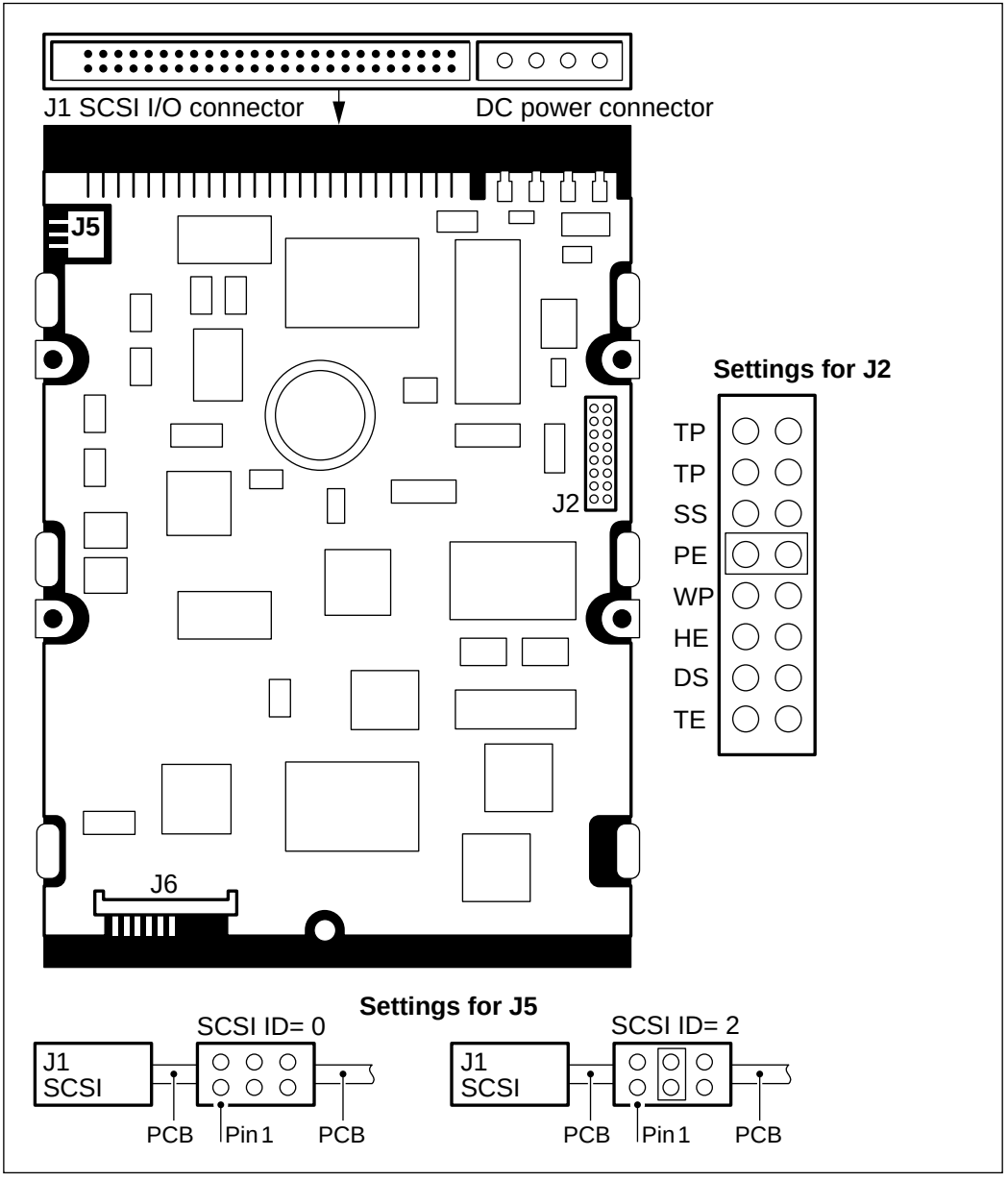


Figure 18-20
Seagate ST31230N disk drive and jumper settings



Disk replacement in a shadowed system

Disk shadowing is available for Modular Option EC systems. Dissimilar disk drives can be used in the same node provided the smaller sized disk has its SCSI address set to 0.

Disk shadowing is a process in which the data from one disk is recorded to a second disk to provide protection against any loss of data in the event a disk failure occurs. Shadowing involves multiple write and alternate read operations. When a disk error occurs on one disk, the system generates a SEER and ignores that disk drive; it continues to work with the other disk drive. In this way, service is not interrupted when the disk goes down. At the scheduled maintenance time, the node is brought down and the disk drive is replaced. Hot plugging of disk drives is not supported.

Disk replacements on an active system should be performed only on those nodes listed in Table 18-2.

> ***Note:*** Nodes not listed in Table 18-2 contain EVB termination. To replace the disk while the system is active will cause an entire system outage if the node is powered down.

Table 18-2
Disk replacements allowed on an active system

Number of nodes in the shadowed system	Nodes on which the disk can be powered down and reseated while the system is active
2-node system	node 2
3-node system	node 2 (if there is only one utility card)
4-node system	nodes 2 and 4 (2, 3, and 4 if there is only one utility card)
5-node system	nodes 2, 3, and 4

If you have disk shadowing, the SCSI ID is 0 for the primary disk and 2 for the secondary disk. Figures 18-14 to 18-20 show the location of the jumpers and SCSI ID settings for the different disk drive models. Figures 18-8 to 18-12 show the slot locations for the shadowed disk.

> ***Note:*** The shadowed disk in a shadowed system has an auxiliary power supply .

Disk unit removal and replacement in a shadowed system

Note: Ensure you have the *System Administration Guide* (NTP 555-7001-30x) on hand when performing the procedures below.

Procedure 18-4
Primary disk replacement

1. Disable disk shadowing.
2. Courtesy down the system.
3. Power down the system.
4. Ensure the new prime disk drive has the same part number, including suffix, as the one shown on the packing slip.
5. Address the new primary disk as SCSI ID=0.
6. Install the primary disk in the prime disk location (the same MSU slot as the disk you are replacing) as described in step 6 above.
7. Reboot the system.
8. Synchronize the disks. Refer to the “Enabling/disabling disk shadowing” section later in this chapter.

Procedure 18-5
Secondary disk replacement

1. Disable disk shadowing.
2. Courtesy down the system.
3. Power down the system.
4. Replace the disk drive.
   a. Loosen the screw on the faceplate covering the disk drive and slide it up and out.
   b. Ensure that the new disk drive has the same part number, including suffix, as the one shown on the packing slip.
   c. Ensure that the SCSI IDs are correct.

      For a shadowed system, the SCSI ID on the secondary disk is 2.
   d. Ensure that all other settings (for example, parity) are correct. Refer to Figures 18-14 to 18-20.

      Note: Verify that the backplane switches are set to shadowing configuration. Refer to Chapter 8 for the correct switch settings.
   e. Open the locking levers and align the new disk drive with the appropriate MSU slot in the module (refer to Figures 18-8 to 18-12 for disk slot locations within the node).

f. Gently slide the new disk drive into the MSU slot that the old secondary disk drive resided in, pushing on the upper and lower edges to ensure that the disk drive is fully seated in the module.

g. Close the locking levers.

h. Replace the faceplate.

5 Reboot the system.

6 Enable disk shadowing.

Upgrading unshadowed systems to shadowed systems

A four-node shadowed system can be installed in two modules. A five-node shadowed system can be installed in three modules.

If you are installing a three-, four-, or five-node unshadowed system, and if you plan to expand to its equivalent shadowed system in the future, do the following:

- Install the initial hardware configuration as if it were a shadowed system (that is, card placement, cabling, and backplane switch settings). Since this is an unshadowed system, the second disk unit is not installed.
- At the time that expansion to a shadowed system is performed, install the second disk units (that is, in a shadowed system the disk unit also contains an auxiliary power unit) in the system.

  The NT PEC codes for the different disk/power units are as follows:

  — 300 Mbyte NT6P43AA

  — 1.0 Gbyte NT6P44AA

Enabling/disabling disk shadowing

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 unscheduled interruption of service.

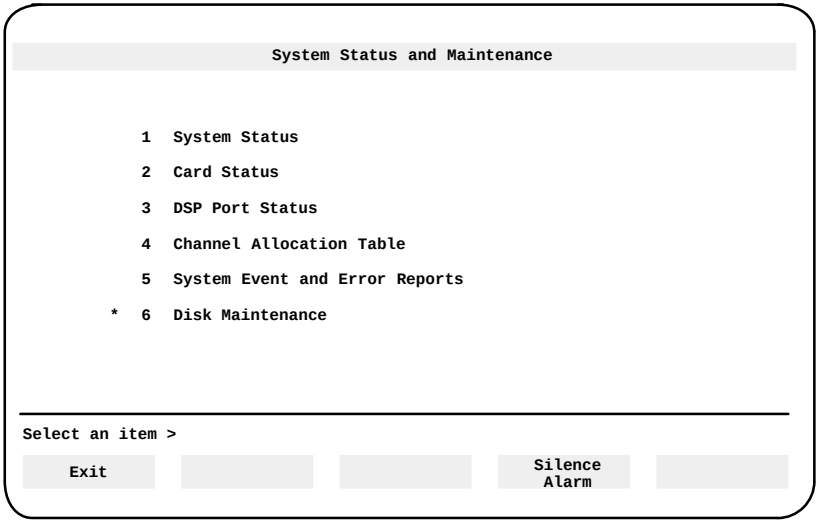
Procedure 18-6
Enabling/disabling disk shadowing

1 Log on at the administration terminal.

2 Select System Status and Maintenance by entering the number corresponding to the item and pressing <Return>.

The System Status and Maintenance screen appears (see Figure 18-21).

Figure 18-21
The System Status and Maintenance screen

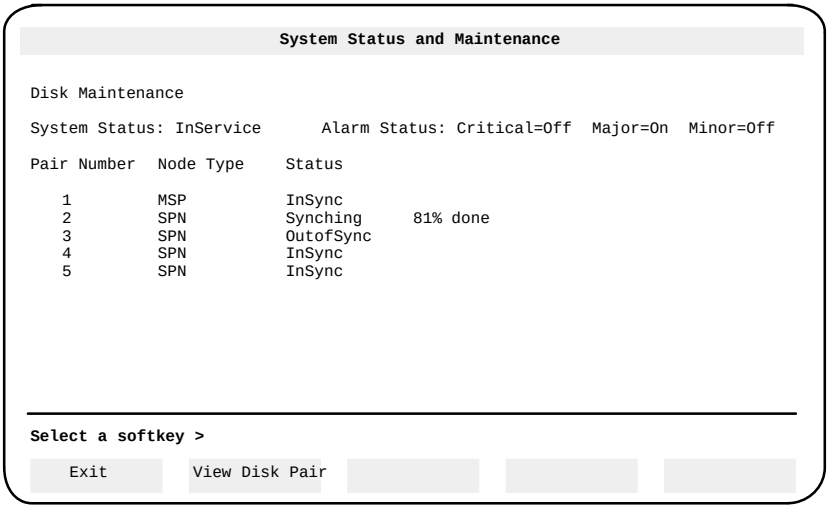


*This item is only available if Disk Shadowing is installed and initialized.

3 Select Disk Maintenance by entering the number corresponding to the item and pressing <Return>.

The Disk Maintenance screen appears (see Figure 18-22.)

Figure 18-22
Disk Maintenance screen



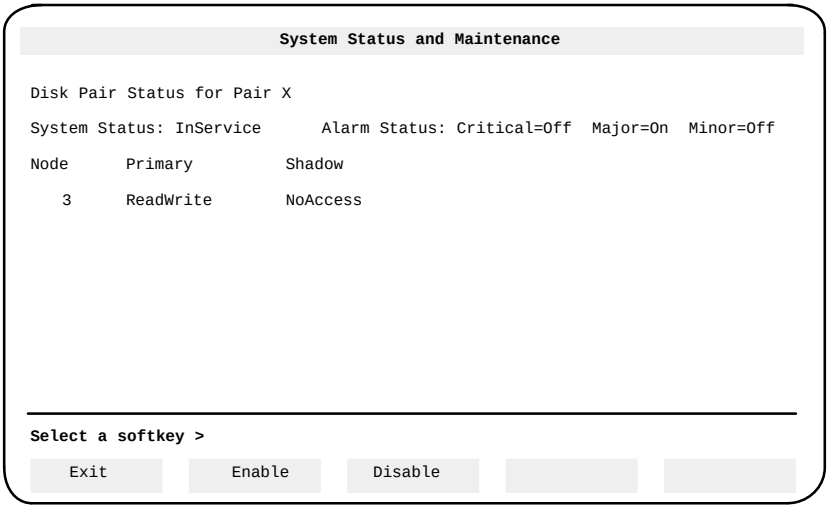
4 Press the [View Disk Pair] softkey.

You are prompted for the disk pair number.

5 Enter the appropriate number.

The Disk Pair Status screen appears (Figure 18-23).

Figure 18-23
The Disk Pair Status screen



6 Press the [Enable] softkey.

The system determines the source of the synch by choosing the disk that is in ReadWrite mode.

Tape drive replacement

The tape drive should be replaced when you receive repeated errors while attempting to write to tape, and the problem cannot be fixed by cleaning the tape heads and using a new tape.

You should also replace the tape drive if the light on the front of the tape drive is out, or if you cannot hear the tape spinning during backup or restore.

WARNING
Risk of electrical shock
Power down the Meridian Mail system before removing and replacing the tape drive.

CAUTION
Risk of equipment damage
Use extreme care when installing the tape drive, because it is extremely susceptible to damage as a result of rough or improper handling.

Procedure 18-7
Replacing the tape drive

1. Power off the Meridian Mail system.
2. Unlatch the tape drive unit and slide it out of the module casing.
3. Ensure that the jumpers on the replacement unit are configured as shown in Figure 18-24 for Archive tape drives, or Figures 18-25 and 18-26 for Tandberg tape drives.
4. Install the new unit in the module and close the locking levers.

Figure 18-24
Archive tape drive connectors and jumper settings

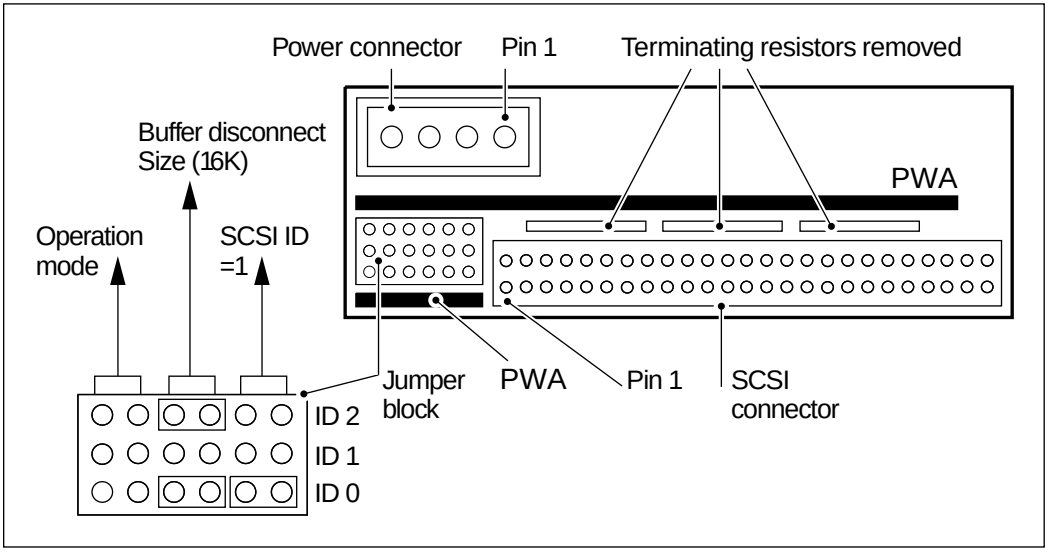


Figure 18-25
Tandberg tape drive and jumper settings

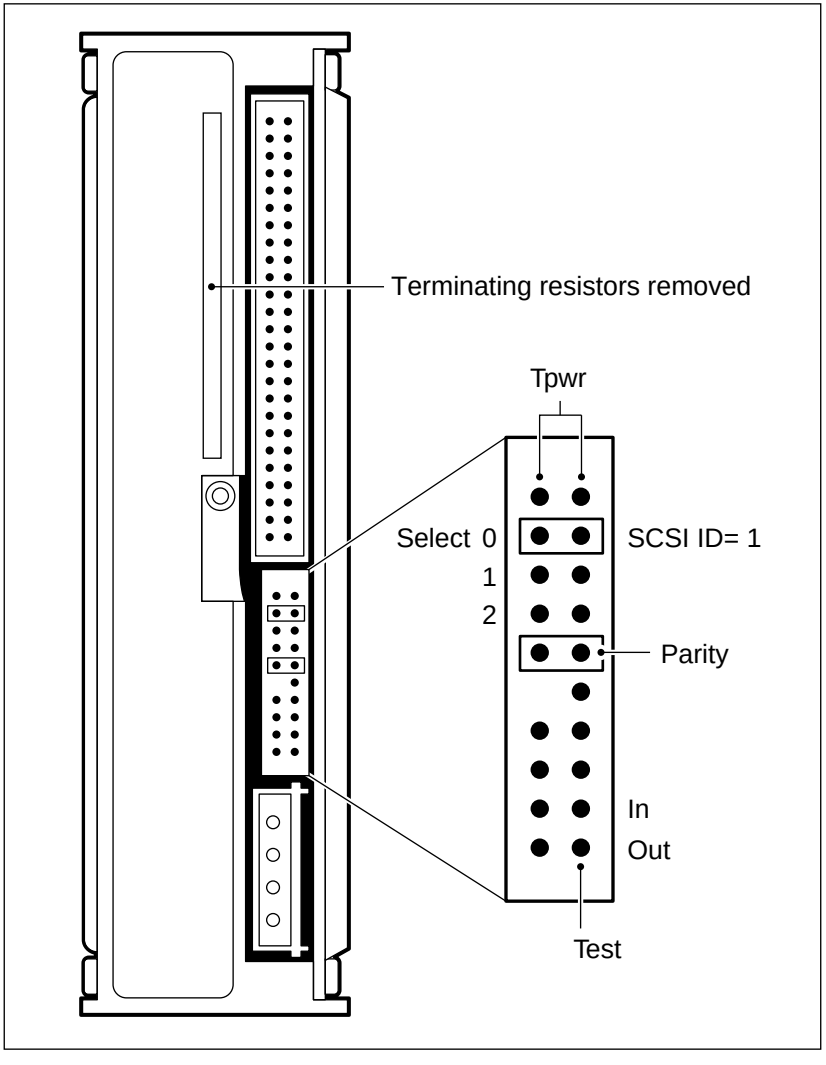
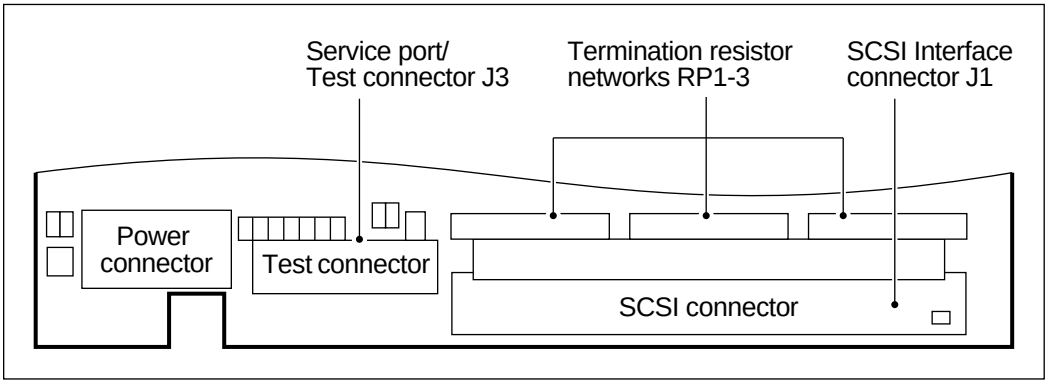


Figure 7-26
Tandberg tape drive connectors (front view)



Note: Terminator resistors are removed.

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, you should 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 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, six inches or longer

  Note: If you have a Tandberg tape drive, do not use Procedures 18-8 and 18-9 as they apply only to Archive tape drives.

  The tape drive cleaning kits are listed in Table 18-3.

Table 18-3
Tape drive cleaning kits

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

Procedure 18-8
Cleaning the Archive tape drive with the cleaning kit

Follow the steps in this procedure if you are cleaning the Archive tape drive with the cleaning kit. If you have a Tandberg tape drive, refer to Procedure 18-10.

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.

4 Release the head loading lever.

5 Obtain the appropriate tape drive kit for your tape drive, as described in Table 18-3.

6 Moisten the flexible pad of the cleaning cartridge with 4 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 into position.

8 Move the moistened pad using 4 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 into place.

13 Move the dry pad using 4 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 next use.

Procedure 18-9
Cleaning the Archive tape drive with swabs and fluid

This procedure should only be used if you have a Archive tape drive. If you have a Tandberg tape drive, refer to Procedure 18-10.

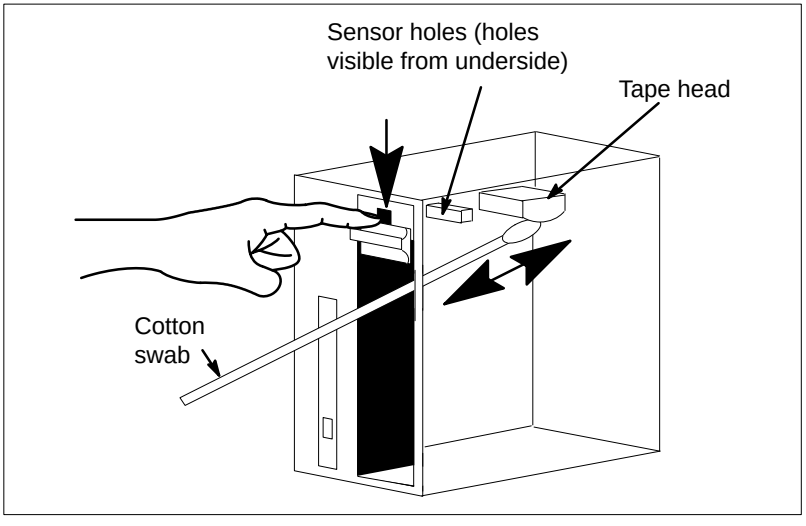
1 If there is a tape cartridge in the tape drive, remove the cartridge.

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 Figure 18-27.)

4 Moisten a pad or swab with the head-cleaning fluid until it is saturated but not dripping.

Figure 18-27
Archive tape drive cleaning



5 Carefully wipe the head in the direction that the tape travels. (Refer to Figure 18-27).

WARNING
Risk of equipment damage
Do not wipe perpendicularly or use a circular scrubbing motion as this could seriously damage the tape heads.

6 DIscard the used swab and repeat steps 4 and 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 2 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.

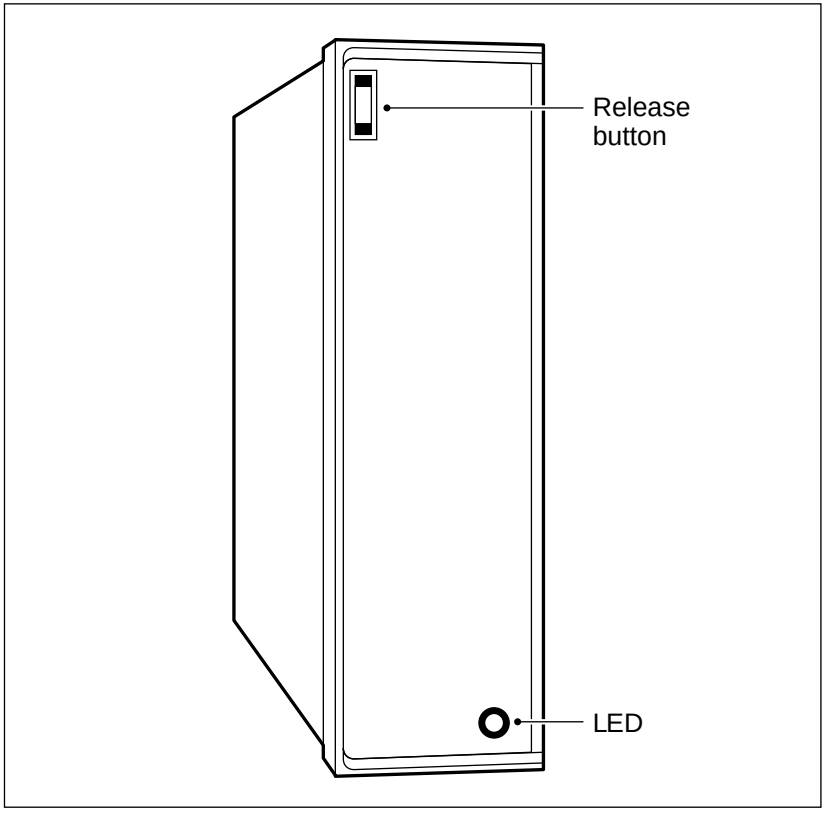
Procedure 18-10
Cleaning the Tandberg tape drive

Follow the steps in this procedure if you are cleaning the Tandberg tape drive. If you have an Archive tape drive, refer to Procedure 18-8 or 18-9.

1 Press the release button on the tape drive (see Figure 18-28).

The tape drive door will spring open.

Figure 18-28
Tandberg tape drive



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.

The door will spring open and the tape drive will stop running.

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 a couple of minute for the tape heads to dry before using the tape drive.

Chapter 19: Common disk subsystem problems

When disk sub-system problems are suspected, check the following:

- device jumpers
- 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 other options on the disk and tape drives. The actual settings on these devices should be checked against the figures and descriptions in Chapter 7.

Bus termination

There should be no onboard terminating resistors on any SCSI device.

Power

Disk and tape drives are fed by one or more DC power converters. The drives may behave erratically when there are problems with the power supply. Ensure that the relevant power supplies are properly installed and that the LEDs on their front panels remain solidly lit. Refer to Chapter 6 for details.

SCSI sanity test

Perform a quick sanity check of the SCSI bus by testing tape and disk drives as follows:

Procedure 19-1

Tape drive sanity test

1. Put a tape in the tape drive.
2. Power on the left side of the module.
3. The tape drive should make a series of clicking noises as it tries to load the tape.

Procedure 19-2

Disk drive sanity test

1. Power on both sides of the module that contains the tape drive.
2. 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

Disk problems are reported by the disk manager in a Class 66 SEER. The complete list of these SEERs can be found in *Meridian Mail Maintenance Messages (SEERs)* (NTP 555–7001-510). The purpose of this section is to give further details about the most common ones.

A SEER in the form

“6603/6605 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 not drive- or manufacturer-dependent. The error code describes the exact problem but is often drive-dependent. There may be an optional disk block number associated with the problem report.

Sense key 2 indicates that 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, the disk should be replaced.

Sense key 3 normally indicates a medium error. Disk controller problems can also cause this sense key to appear. A block number is provided with this problem report. Use the “scsi_util” verify command to check that the block is indeed bad (a bad block will cause an error message). If it is bad, reassign it. If no bad block is found, replace the disk.

Sense key 4 indicates a disk hardware failure. Replace the disk drive.

Sense key 5 indicates an invalid command was sent to the drive. If this appears during regular operation, replace the disk drive and contact Northern Telecom support.

Sense key 6 indicates the SCSI bus has been reset. If this appears during regular operation, contact Northern Telecom support.

A SEER in the form

6604/6606 Disk #> driver error #

is produced when there is a problem communicating with a disk.

Drive 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.

- Ensure that the disk drive is properly seated.
- Check the jumpers on the disk drive. See Chapter 7 for details.
- Ensure that the SCSI cable and power cable from the disk drive to the drive plate connectors are firmly attached at both ends.

Data loss and disk replacement

When a disk fails and needs to be replaced, a number of mechanisms exist to limit data loss:

- A tape backup may have been performed prior to 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
Potential loss of data

Never back up over an existing good backup, as the data on the disk may now be corrupted, and you may destroy useful information.

The backup utility attempts 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 may result in minor operational problems for Meridian Mail, such as corruption of some messages or mailboxes. However, damage to critical areas can cause a system malfunction.

Replace the disk and restore the backup made after failure onto the new disk. If the system malfunctions afterwards, restore the data from the most recent backup done prior to the disk failure.

Appendix A: Terminal configuration

Several different models of administration terminal can be used with Meridian Mail. This appendix shows how to configure each terminal for proper data communications with Meridian Mail. Chapter 10 shows how to cable these terminals to the printer and the A/B switchbox.

Release 10.0 of Meridian Mail allows baud rates to be set to 2400 or 9600 bps, depending on the type of modem and the baud rate selected for your particular configuration. Whichever baud rate is selected, the terminal configuration must match the baud rate set for the modems. See "Appendix C: Modem configuration" for further information.

You configure a terminal by entering "setup" mode.

CAUTION
Risk of data loss
You can enter setup mode at any time, but it is recommended that you do so only while logged off from Meridian Mail.

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 indicated by underscores in the figures illustrating setup screens. Action fields cause an action to take place, such as clearing the display. 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 HP700/32 terminal

Procedure 20-1
Configuring an HP700/32 terminal

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 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 contents of 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, so that they match those shown in Figure 20-1.

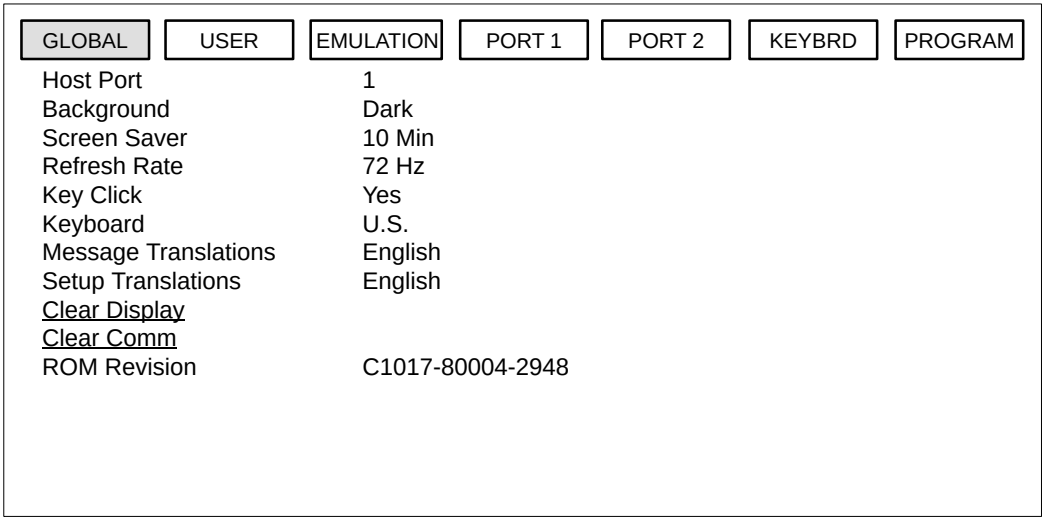
Use the following keys to view and change setup values:

Up and down arrow keys	*Move from field to field.*
Left and right arrow keys	*Scroll through possible values for a parameter. The values are displayed in a window at the bottom of the screen.*
<Return>	*Cause the requested action to take place in an action field.*
<NextScreen>	*Move to next setup screen.*
<PrevScreen>	*Move to previous setup screen.*

4 Save changes by pressing <F6-Save> on *each screen* on which you make changes you want to save.

5 Exit setup mode by pressing the <SETUP> key.

Figure 20-1
HP700/32 setup screens



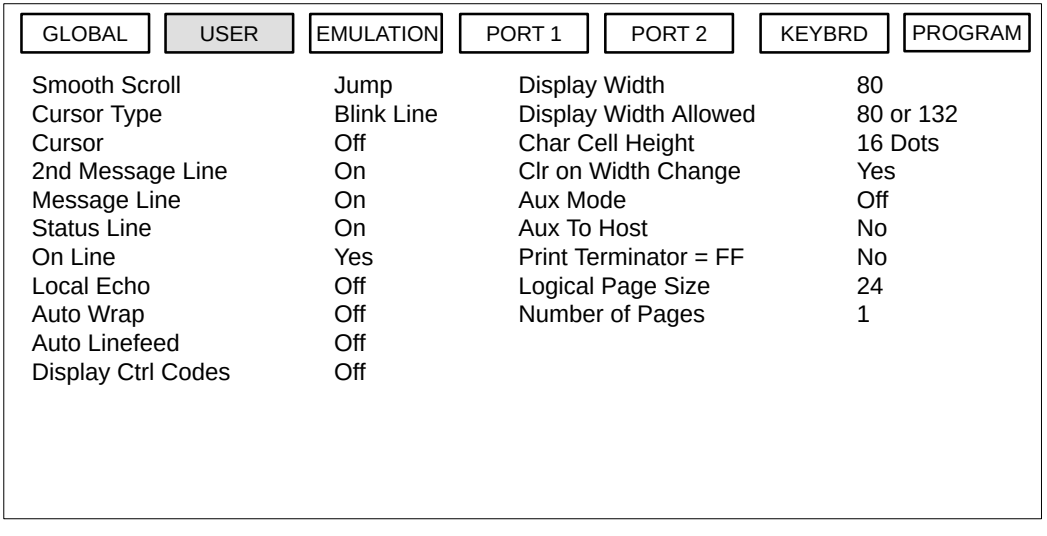
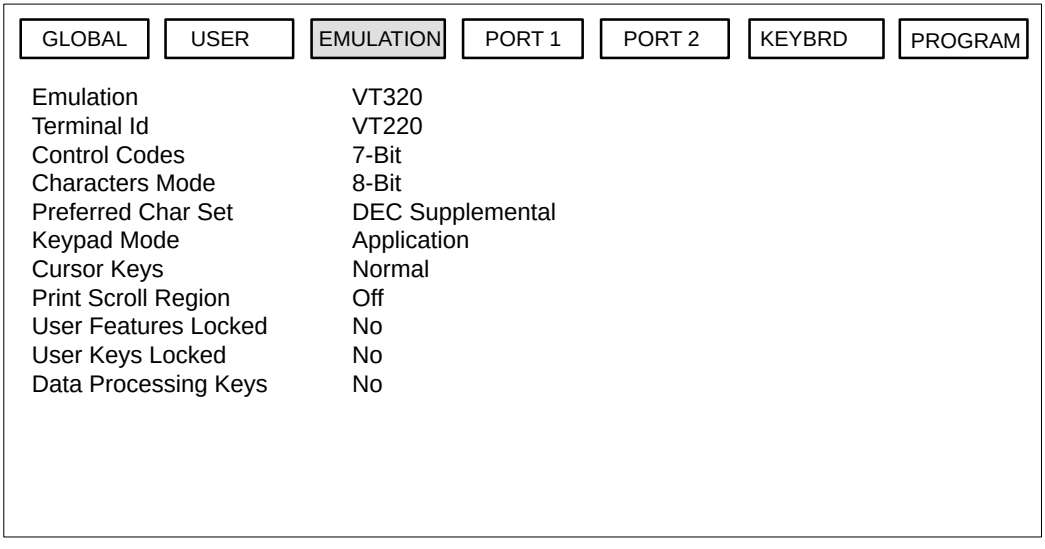


Figure 20-1 (continued)
HP700/32 setup screens



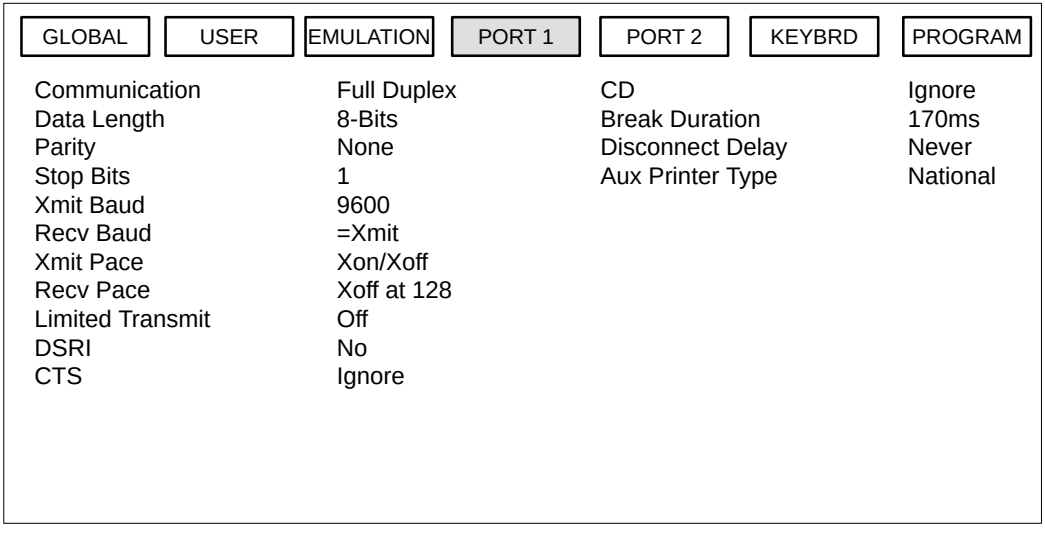
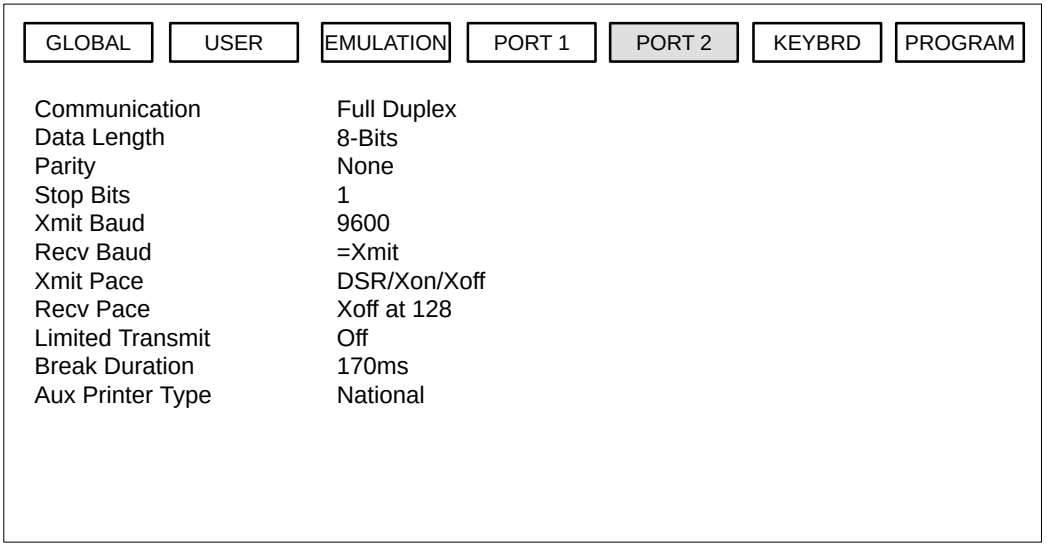
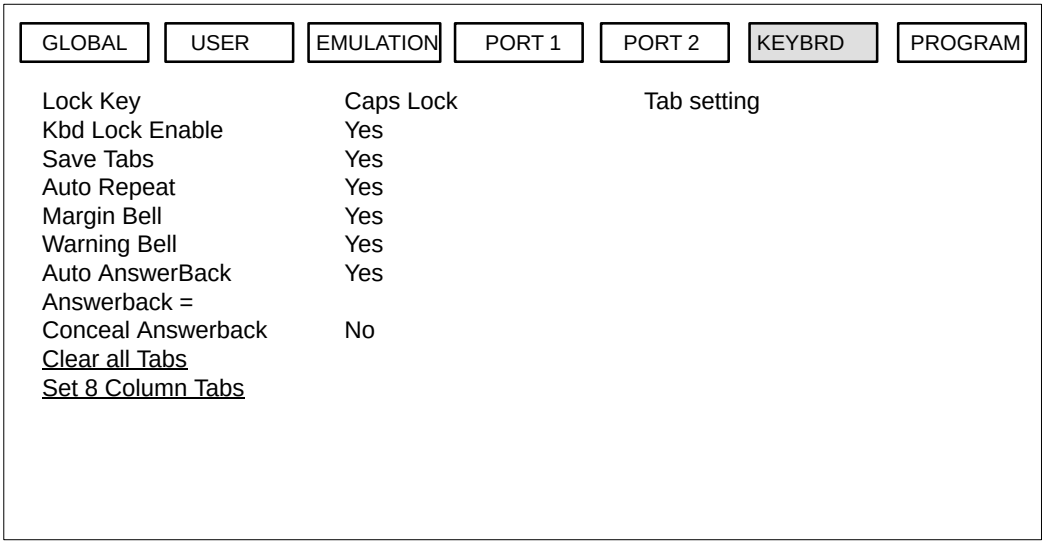


Figure 20-1 (continued)
HP700/32 setup screens





Configuring a VT420 terminal

Note: The VT420 terminal has been discontinued by the manufacturer and is superseded by the VT520.

Procedure 20-2
Configuring a VT420 terminal

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 contents of 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, so that they match those shown in Figure 20-2.

Use the following keys to view and change setup values:

Arrow keys	*Move from field to field.*
<Return>	*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 <Return>. To move to the next setup screen, select *To Next Set-Up* on any other setup screen.

4 Save changes by returning to the *Setup Directory* screen, moving the cursor to the *Save* field, and pressing <Return>.

5 Exit setup mode by pressing the <SETUP> key.

Figure 20-2
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
```

Configuring a VT520 terminal

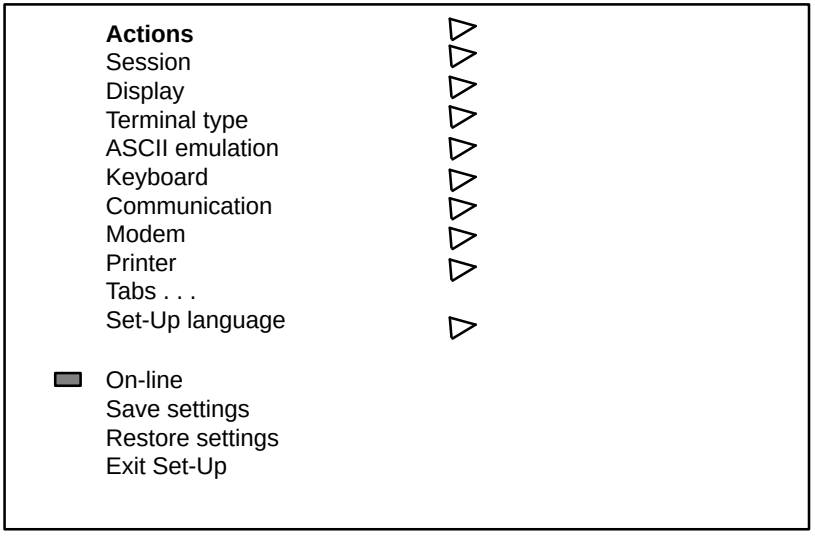
Procedure 20-3
Configuring a VT520 terminal

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 Figure 20-3).

Figure 20-3
VT520 terminal Main Set-Up window



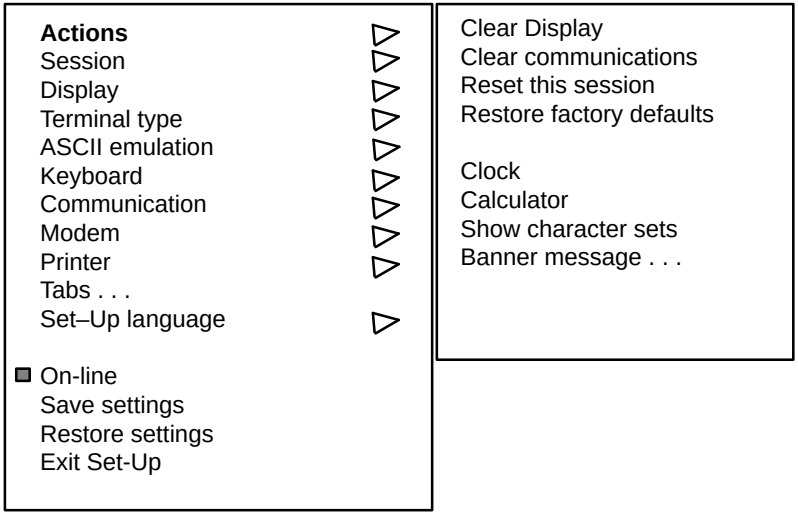
3 Use the up and down arrow keys to highlight the setup feature which is to be changed (for example, **Actions**).

4 When the setup feature is highlighted, use one of the following methods to select the appropriate settings:

Table 20-1
Navigating the setup windows

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 Figure 20-4 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.

Figure 20-4
VT520 terminal - sample feature pop-up window



Note: Features shown in parentheses are grayed out on the window.

5 Configure the terminal to match mandatory settings in Table 20-2. If no setting is specified, select the parameter which best suits your environment.

6 Press <SETUP> again to exit setup mode.

Table 20-2
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

–continued–

Table 20-2
VT520 setup values - continued

Set-up Feature	First level	Mandatory setting or description
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.)
	Screen alignment	
Terminal type	Emulation mode	VT520
	Terminal ID to host	VT520
	VT default char set	DEC Multinational - See user documentation as well.

–continued–

Table 20-2
VT520 setup values - continued

Set-up Feature	First level	Mandatory setting or description
Terminal type (continued)	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	

–continued–

Table 20-2
VT520 setup values - continued

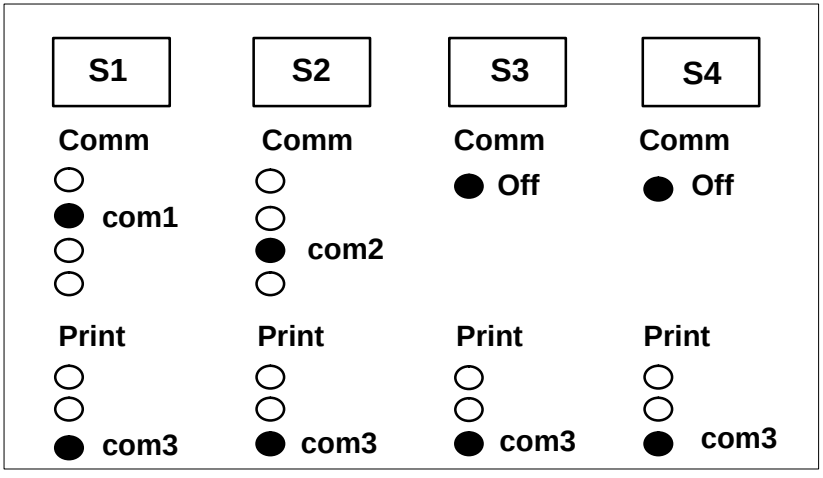
Set-up Feature	First level	Mandatory setting or description
Communication	Port select . . .	See Figure 20-5.
	Word size	8 bit
	Parity	None
	Stop bits	1 bit
	Transmit speed	2400 baud
	Receive speed	Transmit speed
	Transmit flow control	XON/XOFF
	Receive flow control	XON/XOFF
	Flow control threshold	Low
	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 Figure 20-5.
	Print mode	Normal
	Printer type	DEC ANSI
	DEC/ISO char sets	Country dependent setting

–continued–

Table 20-2
VT520 setup values - continued

Set-up Feature	First level	Mandatory setting or description
Printer (continued)	(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, push <Enter> to save.
Restore settings		
Exit Set-Up		
–end–		

Figure 20-5
Port selection for VT520



Configuring an NT220 terminal

Procedure 20-4
Configuring an NT220 terminal

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.

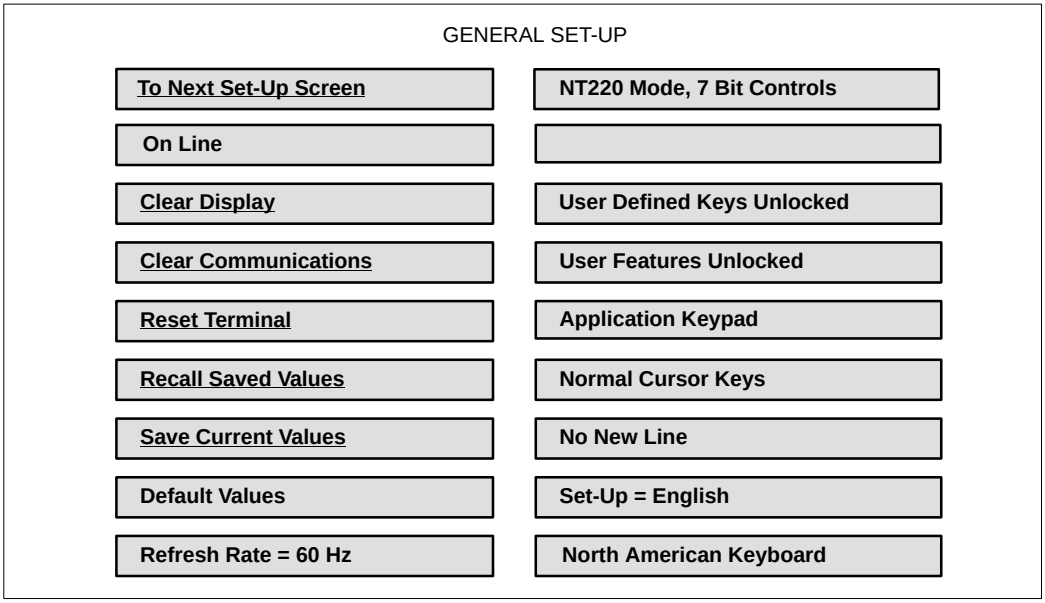
   Note: There may be minor differences between what you see in this chapter and the contents of the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3. Change the values in each parameter field (on each setup screen) as necessary, so that they match those shown in Figure 20-6.

   Use the following keys to view and change setup values:

Arrow keys	*Move from field to field.*
<Return>	*Scroll through possible values or cause requested action to take place (depends on type of field).*

   To move to the next setup screen, select *To Next Set-Up Screen* on any setup screen.
4. Save changes by returning to the *General Set-Up* screen, moving the cursor to the *Save Current Values* field, and pressing <Return>.
5. Exit setup mode by pressing the <SETUP> key.

Figure 20-6
NT220 setup screens



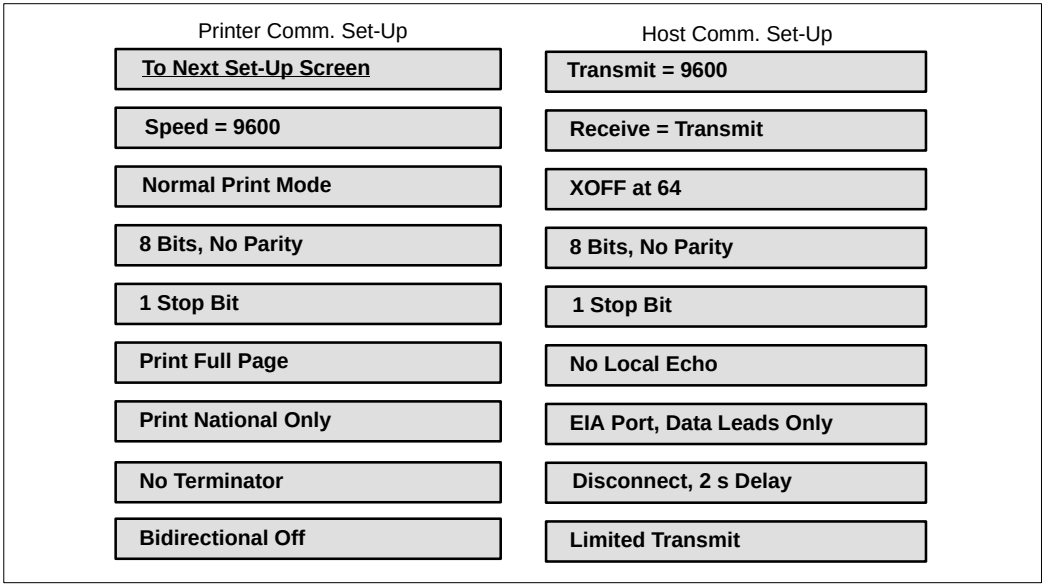
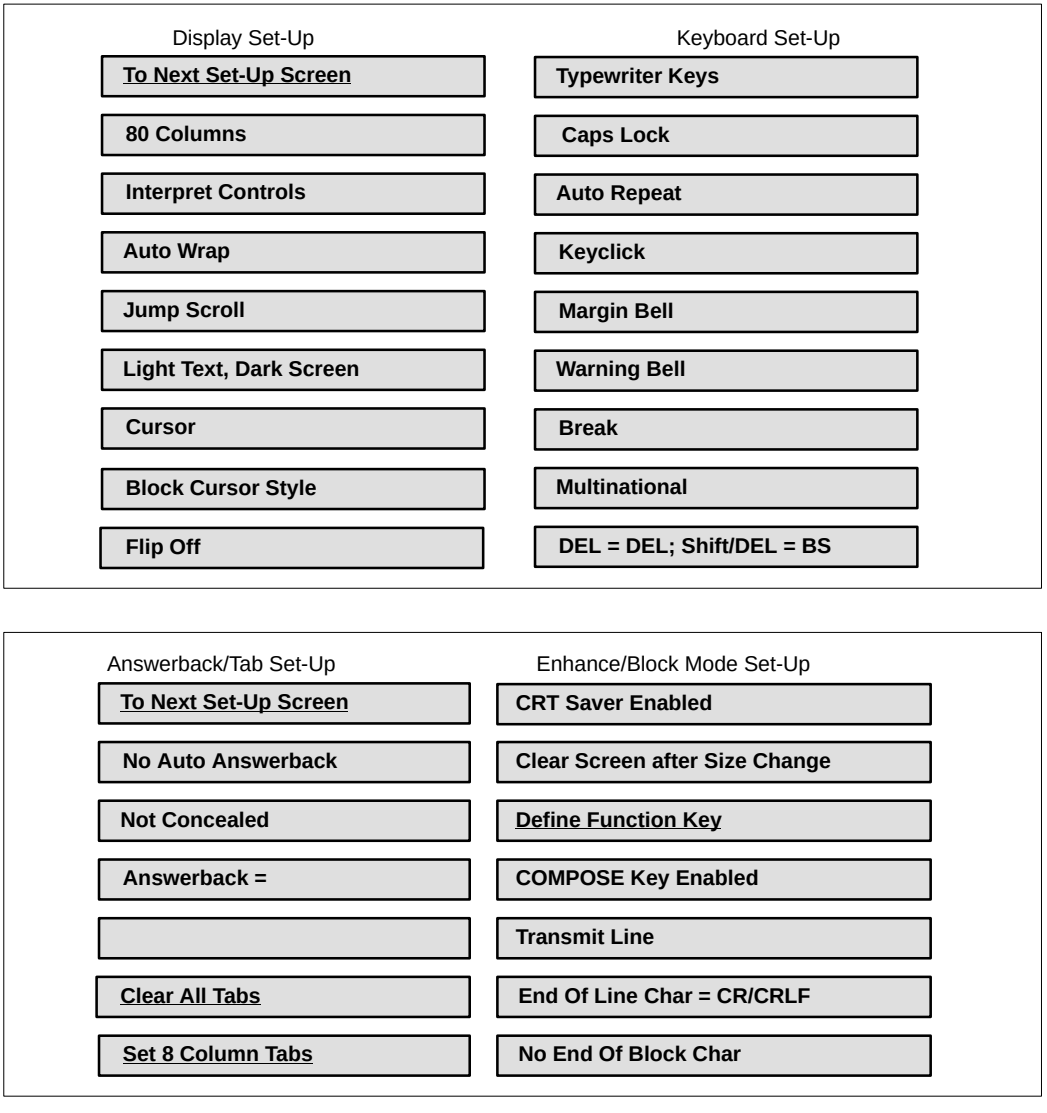


Figure 20-6 (continued)
NT220 setup screens



Configuring an HP700/22 terminal

Procedure 20-5
Configuring an HP700/22 terminal

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 contents of 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, so that they match those shown in Figure 20-7.

   Use the following keys to view and change setup values:

Arrow keys	*Move from field to field.*
<Return>	*Scroll through possible values, which are displayed in the field, or cause requested action to take place (depends on type of field).*
<NextScreen>	*Move to next setup screen.*
<PrevScreen>	*Move to previous setup screen.*

4. Save changes by returning to the *General Setup* screen, moving the cursor to the *Save* field, and pressing <Return>.
5. Exit setup mode by pressing the <SETUP> key.

Figure 20-7
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	EM220
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

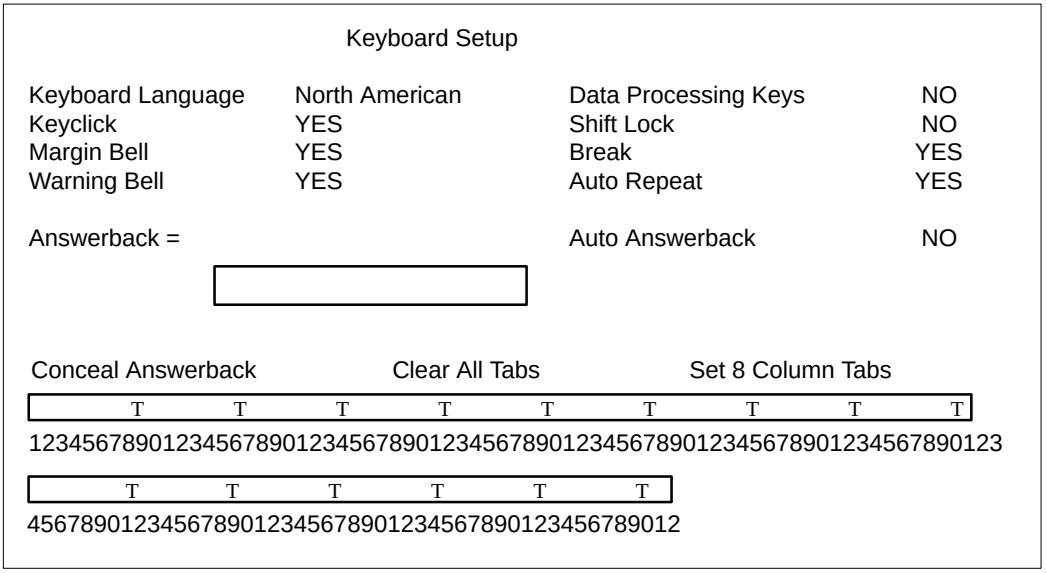
Host

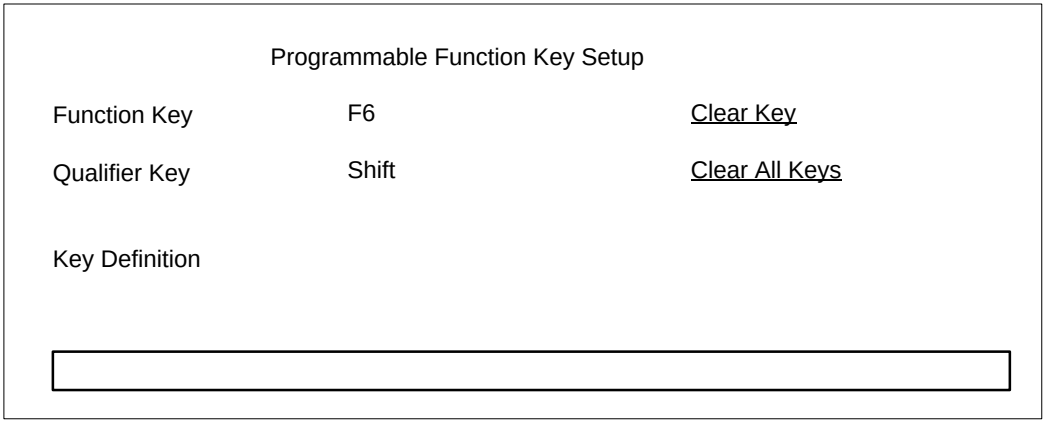
Xmit Baudrate	9600	XON/XOFF	@ 64
Recv Baudrate	=Xmit	Disconnect Delay	2 s
DataBits/Parity	8/None	Stop Bits	1
Check Parity	NO	Local Echo	NO
Port Selection	EIA, Data Leads Only	Unlimited Xmit	NO

Printer

Baudrate	9600	Print Mode	Normal
DataBits/Parity	8/None	Print Scroll Region	NO
Stop Bits	1	Terminator	None
Character Set	National Only		

Figure 20-7 (continued)
HP700/22 setup screens





Configuring a VT320 terminal

Procedure 20-6
Configuring a VT320 terminal

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.

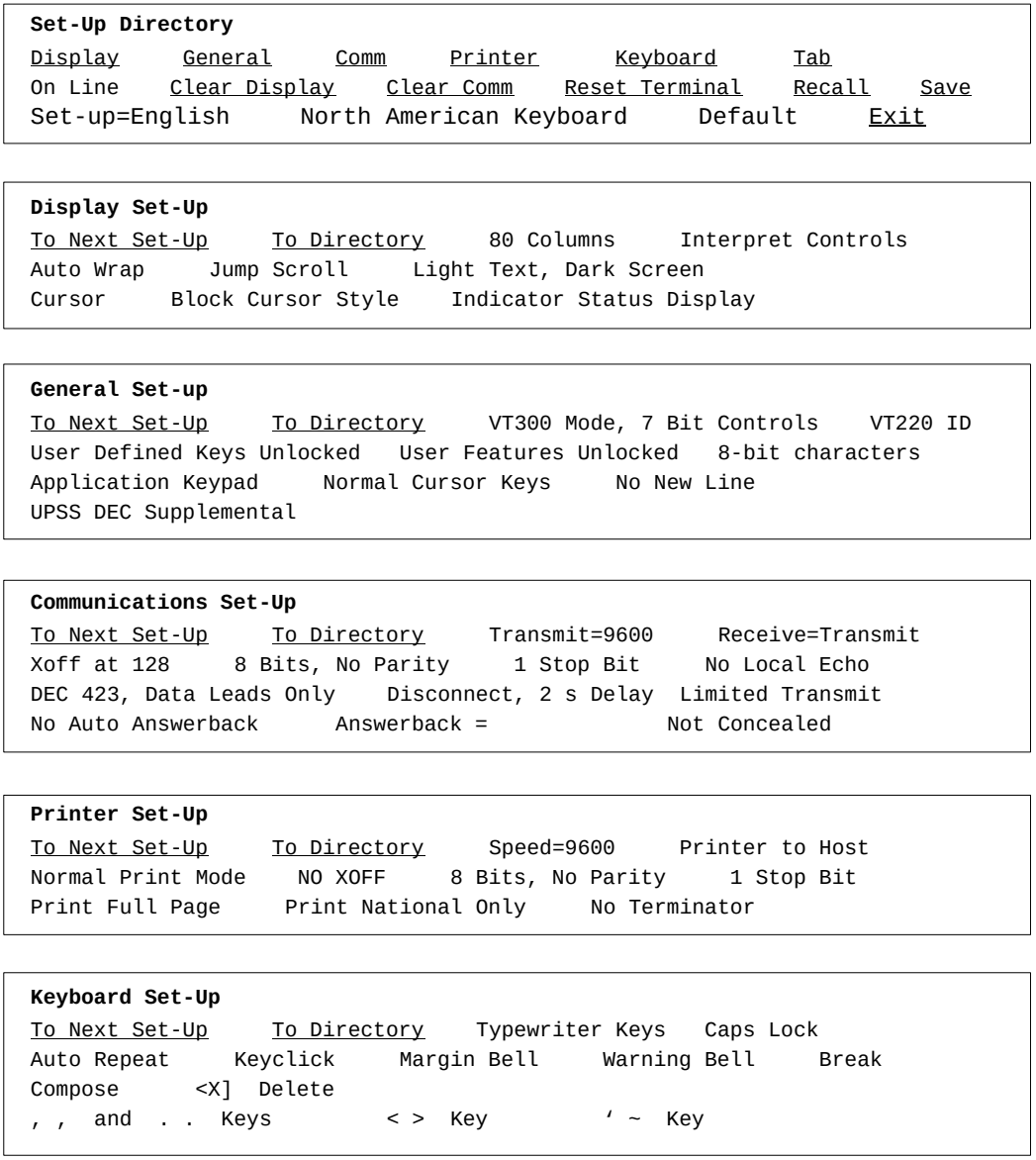
   Note: There may be minor differences between what you see in this chapter and the contents of the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3. Change the values in each parameter field (on each setup screen) as necessary, so that they match those shown in Figure 20-8.

   Use the following keys to view and change setup values:

Arrow keys	*Move from field to field.*
<Return>	*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 <Return>. To move to the next setup screen, select *To Next Set-Up* on any other setup screen.
4. Save changes by returning to the *Setup Directory* screen, moving the cursor to the *Save* field, and pressing <Return>.
5. Exit setup mode by pressing the <SETUP> key.

Figure 20-8
VT320 setup screens



Configuring a VT220 terminal

Procedure 20-7
Configuring a VT220 terminal

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.

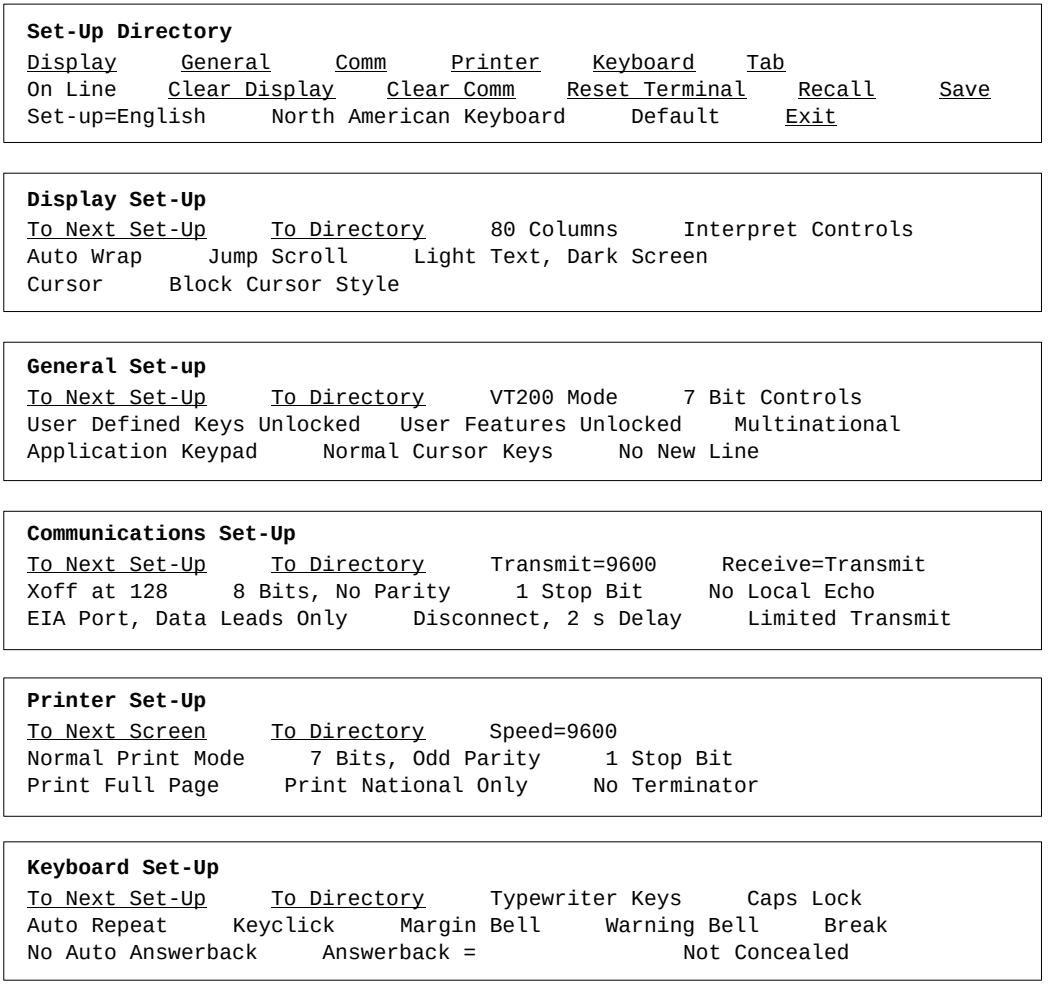
   Note: There may be minor differences between what you see in this chapter and the contents of the setup screens on your terminal. This is due to improvements made to the terminal by the manufacturer. Follow the setup documented here as closely as possible.
3. Change the values in each parameter field (on each setup screen) as necessary, so that they match those shown in Figure 20-9.

   Use the following keys to view and change setup values:

Arrow keys	*Move from field to field.*
<Return>	*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 <Return>. To move to the next setup screen, select *To Next Set-Up* on any other setup screen.
4. Save changes by returning to the *Setup Directory* screen, moving the cursor to the *Save* field, and pressing <Return>.
5. Exit setup mode by pressing the <SETUP> key.

Figure 20-9
VT220 setup screens



Appendix B: Configuration of modems for Remote Access

Each modem supplied with Meridian Mail needs to be configured before use. Configure the modem by connecting it to a VT220 compatible terminal and sending commands to it as described in this chapter. The UDS modem may be configured from the front panel if you prefer.

Off-site personnel can access Meridian Mail by dialing in through a remote modem connected to a terminal. Before this can be done, the A/B switch needs to be set to disconnect the local administration terminal from Meridian Mail and attach the local modem in its place.

All modems, with the exception of UDS, need to be connected to a terminal for configuration. If you wish, you can connect it temporarily to the Meridian Mail administration terminal for configuration, and move it to its permanent location afterwards.

Configuration of modems may vary slightly from one model to the next. Refer to the manual that accompanies the modem as well as the procedures in this chapter when configuring the modem.

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.

Supported modems

In Meridian Mail Release 10.0, the baud rate of the 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).

To determine the appropriate configuration method for your modem, refer to Table 21-1 for terminals set at 9600 bps, or Table 21-2 for terminals set at 2400 bps.

> ***Note:*** UDS modems can be configured manually using the front-panel buttons or through the administration terminal.

Table 21-1
Local modem setups for 9600 bps operations

Modem type	Configuration method	Refer to
UDS 2440	Front panel	Procedure 21-1
UDS 2440	Terminal	Procedure 21-2
Ven-Tel 2400-33/ 2400 Plus II	Terminal	Procedure 21-3
Ven-Tel 9600 Plus/ 9600 Plus II	Terminal	Procedure 21- 4

Table 21-2
Local modem setups for 2400 bps operations

Modem type	Configuration method	Refer to
Ven-Tel EC2400-33/ 2400 Plus II	Terminal	Procedure 21-6
Ven-Tel EC2400-33/ 2400 Plus II	Terminal	Procedure 21-10
UDS 2440	Terminal	Procedure 21-7
UDS 2440	Front panel	Procedure 21-8
UDS EC 224 A/D	Terminal	Procedure 21-9

Table 21-3
Remote modem setups for 2400 bps modems

Modem type	Refer to
Ven-Tel 2400-33/2400 Plus II	Procedure 21-10
UDS 2440	Procedure 21-11
UDS 224 A/D	Procedure 21-12

Table 21-4
Remote modem setups for 9600 bps modems

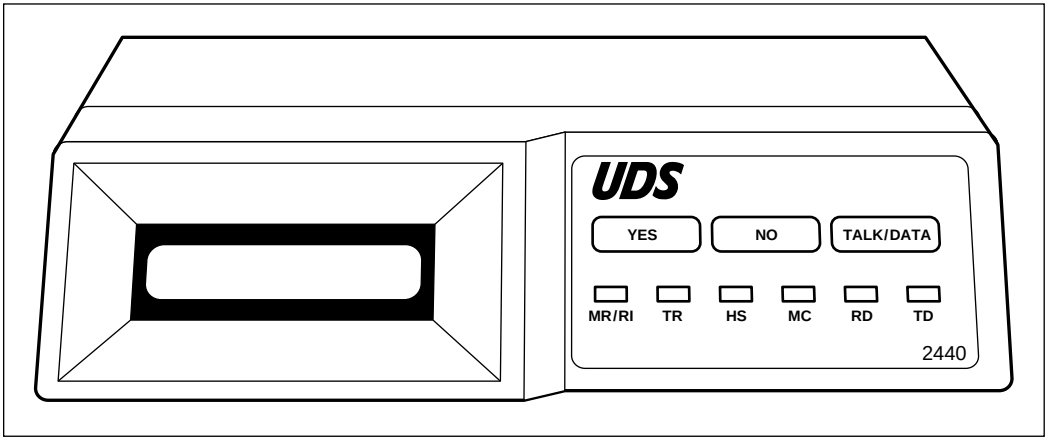
Modem type	Refer to
Ven-Tel 9600/9600 Plus II	Procedure 21-13

Local modem setups for 9600 bps operations

UDS 2440 modem for 9600 bps operation

The UDS 2440 modem can be configured for 9600 bps operation using either the administration terminal or the front panel on the modem. The front panel of the modem contains a small display and several buttons (YES, NO, and TALK) which are used to configure the modem.

Figure 21-1
UDS 2440 modem — front panel



Procedure 21-1
Configuring the UDS 2440 modem through the front panel

1 Press the NO button to advance to “OPTIONS?” prompt.

2 Respond to the appropriate prompt as outlined in Table 21-5 below.

Table 21-5
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 will reappear and you can continue your entries.

If you have already saved the configuration, start over from step 1.

Procedure 21-2
Configuring the UDS 2440 modem through the terminal

1 Enter the commands on Table 21-6 on the administration terminal to configure the modem.

Table 21-6
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>	

Ven-Tel modems for 9600 bps operation

The Ven-Tel modems can be configured for 9600 bps operation through the administration terminal.

Procedure 21-3
Configuring the Ven-Tel 2400-33/2400 Plus II modem

1 Enter the commands on Table 21-7 on the administration terminal to configure the modem.

Table 21-7
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
at\n3 <Return>	OK
at\j0 <Return>	OK
at\q1\x1 <Return>	OK
–continued–	

Table 21-7
Ven-Tel 2400-33/2400 Plus II modem configuration commands – continued

Enter the following command	System response
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>	
–end–	

Procedure 21-4
Configuring the Ven-Tel 9600 Plus/9600 Plus II modem

1 Enter the commands on Table 21-8 on the administration terminal to configure the modem.

Table 21-8
Ven-Tel 9600 Plus/9600 Plus II modem configuration commands

Enter the following command	System response
at&f <Return>	OK
at&c1 <Return>	OK
at\n3 <Return>	OK
at\q0 <Return>	OK
at%f2 <Return>	OK
at\f0 <Return>	OK
ats0=1 <Return>	OK
ate0 q1 <Return>	No response is seen on the terminal after this command
at&w <Return>	

Local modem setups for 2400 bps operation

Ven-Tel modems for 2400 bps operation

The following versions of Ven-Tel modems are supported for 2400 baud terminals in Release 10.0 of Meridian Mail:

- EC2400-33, rev. 5.2 or 6.0
- EC2400-33 Plus II

Procedure 21-5
Setting the Ven–Tel modem switches

You need to set switches on both models of the Ven-Tel modem. The switch settings are the same for both local and remote use.

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. 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.

Procedure 21-6

Configuring the Ven-Tel local modem

1. Connect the modem to a terminal using a straight-through cable.
2. Enter **at&f &d3 \j1 \n3 s0=1 s64=1 s14=12** <Return> .

   The cursor returns to "A" on the same line.

   Note: 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.
3. Enter **ate0 &w** <Return>.
4. Turn off the modem for 10 seconds and then turn back on.

UDS modems for 2400 bps operation

Procedure 21-7
Configuring the UDS 2440 modem through the terminal

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.

Procedure 21-8
Configuring UDS 2440 modem using the front panel method

The front panel of the modem contains a small display and several buttons (YES, NO, and TALK) which are used to configure the modem.

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 on Table 21-9 to configure the modem.

Table 21-9
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

–continued–

Table 21-9
UDS 2440 modem configuration (front panel method)– continued

Prompt	Response
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
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

–continued–

Table 21-9
UDS 2440 modem configuration (front panel method)– continued

Prompt	Response
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
CTS OPTS?	NO
P 21 OPTS?	NO
P 23 OPTS?	NO
P 25 OPTS?	NO
PIN OPTS?	NO
MSG OPTS?	NO
SECURITY?	NO

–continued –

Table 21-9
UDS 2440 modem configuration (front panel method)– continued

Prompt	Response
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	
–end–	

Procedure 21-9
Configuring the UDS 224 A/D through the terminal

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 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 will no longer see your input on the terminal screen.
4. Enter **at&w** <Return>.
5. Turn the modem off, wait ten seconds, then turn it back on.

Table 21-10
UDS EC 224 A/D modem hardware configuration

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. 3 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
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

Remote modem setups for 2400 bps modems

Procedure 21-10
Configuring the Ven-Tel 2400-33/2400 Plus II

1. Connect the modem to a terminal using a straight-through cable.
2. Enter **at&f** <Return> .
3. Enter **at&f \n3 &c1 s14=170** <Return> .

   The response on the terminal is "OK".
4. Enter **at&w** <Return>.
5. Turn off the modem for 10 seconds and then turn back on.

Procedure 21-11
Configuring the UDS 2440

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 will no longer see your input on the terminal screen.
4. Turn the modem off, wait ten seconds, then turn it back on.

Procedure 21-12
Configuring the UDS 224 A/D

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 jumper settings are used for the UDS modem. For reference, see Table 21-10.

Remote modem setups for 9600 bps modems

Procedure 21-13
Configuring the Ven-Tel 9600/9600 Plus II

1. Connect the modem to a terminal using a straight-through cable.
2. Enter **at&f** <Return> .

3. Enter **at&f \n3 &c1 s14=170** <Return> .
   The response on the terminal is “OK”.
4. Enter **at&w** <Return>.
5. Turn off the modem for 10 seconds and then turn back on.

Appendix C: Meridian Mail Modular Option EC Release 10.0 enhancements

The Meridian Mail Modular Option EC platform was introduced with Meridian Mail Release 8. It is packaged in the universal equipment module (UEM), allowing it to be integrated within a Meridian 1 column or installed as a stand-alone system. Software and hardware advances increase the functional flexibility and simplify installation, administration, and maintenance of the system.

Software enhancements

Several software enhancements increase the flexibility and accuracy of the Modular Option EC system. These enhancements include

- speed change utility which allows you to change the setting of the CPU card to run at 9600 or 2400 bps
- online data port reconfiguration for MAT and GAC terminals, and ACCESS and AdminPlus
- new diagnostic tools for ACCESS and Modular Option EC hardware

Speed Change Utility

The Speed Change Utility displays the current setting of the CPU card (either 2400 or 9600 bps) and allows the user to change the setting. The new rate setting is stored on the MMP40 card in non-volatile memory (NVRAM).

The utility can be used any time the console speed needs to be changed. For example, it may be used to change the factory setting from the default when installing a new CPU card or to change an established setting when replacing a card.

The 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 for the CPU card.

On-line data port reconfiguration for MAT and GAC terminals, and ACCESS and AdminPlus

The baud rate for Multi-Administration Terminal (MAT), Guest Administration Console (GAC), ACCESS, and AdminPlus data ports can now be changed on-line so a system reboot is no longer necessary.

This operation can be performed through the Modify Data Port screen in the Modify Hardware utility, which is available through the TOOLS level. Once the baud rate has been changed, the attached terminal or other device must be set up to match the data port change.

Meridian ACCESS Diagnostic Tool Utility

In Release 10.0, a new Meridian ACCESS Diagnostic Tool (MADT) monitors the status of the ACCESS link. This utility is available from the TOOLS menu.

Hardware enhancements

Several hardware enhancements increase the processing speed and capacity of the Modular Option EC system. These enhancements include

- MMP40 CPU card is required in all nodes
- new Tandberg tape drive
- high-speed modems are now supported for systems running at 9600 bps

Hardware components

MMP40 card (NT6P97AA)

The MMP40 card is the central processing unit for the system and must be installed in every node. It comprises a 24-MHz 68040 processor, 16-Mbyte RAM, a SCSI interface processor, and two RS-232 serial ports. The 68K card, which replaced the ESBC, SCSI/RAM, and 2-Mbyte or 2.5-Mbyte RAM memory cards of older Meridian Mail hardware platforms, is no longer supported for the Modular Option EC system.

In node 1, each of the two RS-232 ports serves a specific function. One is an asynchronous RS-232 port for the system administration terminal. The other is a synchronous port which provides access to the Applications Module Link (AML), Integrated Services Digital Network/Applications Module (ISDN/AP), or Command Status Link (CSL) data link to the Meridian 1.

The console can be upgraded to run at 9600 bps by selecting this option when installing the new MMP40 card. This upgrade is optional as the system will run at 2400 bps. Both the terminal and modems must be set to match the speed of the installed baud rate.

Function

- memory for programs and data
- interface to the tape and disk storage devices
- direct connection to the Meridian 1

Points to note

- An MMP40 CPU card must be installed in every node on the system .

Tape drive (NT6P05AA)

All new systems will be shipped with the Tandberg TDC4220 tape drive. This tape drive increases the maximum storage capacity of one tape from 250 Mbytes to 2.5 Gbytes and doubles the speed of operation. Archive Viper tape drives are also supported in this release.

An upgrade to the Tandberg drive is not a requirement for conversion from an earlier release of Meridian Mail to Release 10.0, as the existing Archive Viper tape drive is fully compatible. If you choose to install the new Tandberg tape drive, refer to Chapter 15, “Converting from an existing Modular Option EC system to Release 10.0,” for detailed instructions.

Function

- Reads information from the Install/data tape cartridge.
- May be used to back up system and voice data.

Points to note

- Always resides in the slot labeled MSU1 (mass storage unit) of the prime node.

Modems

One new modem will be supported for remote access for those Modular Option EC systems which are running at 9600 bps.

- Ven–Tel 9600 Plus/9600 Plus II

In addition, the following existing modems are also supported for 9600 bps:

- Ven–Tel 2400-33/2400 Plus II
- UDS 2440

The terminal configuration must match the baud rate set for the modems. Existing modems are still supported for systems which are running at 2400 bps.

Function

- Provides a communication link to receive and transmit data between terminal (DTE) and terminal devices (DCE).

Points to note

- The terminal configuration must match the baud rate set for the modem.

Appendix D: MMP40 troubleshooting flowcharts

The following charts can be used to determine causes and solutions for potential problems for the 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 starting on page 23--13.

Figure 23-1
MMP40 troubleshooting flowcharts

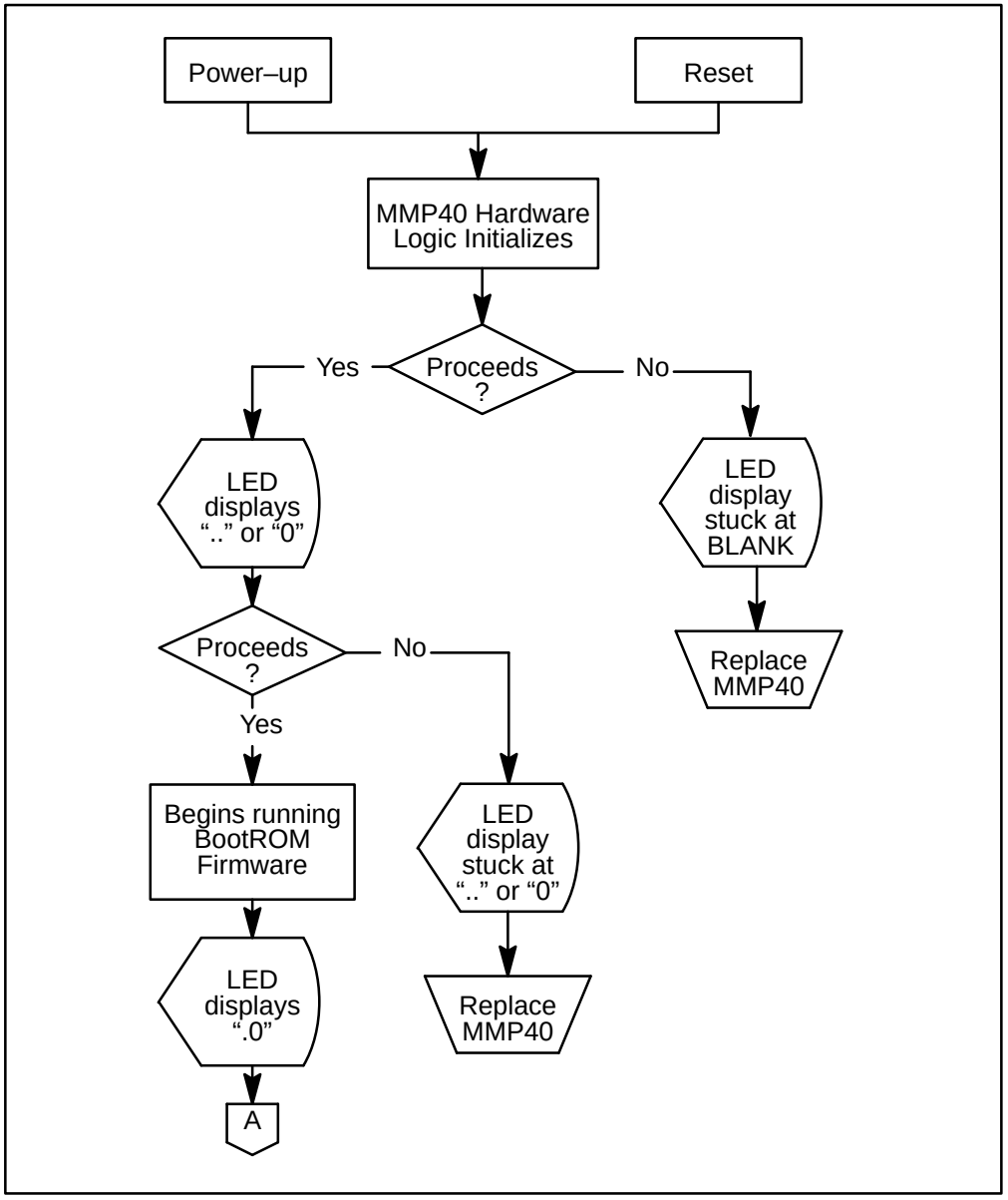


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

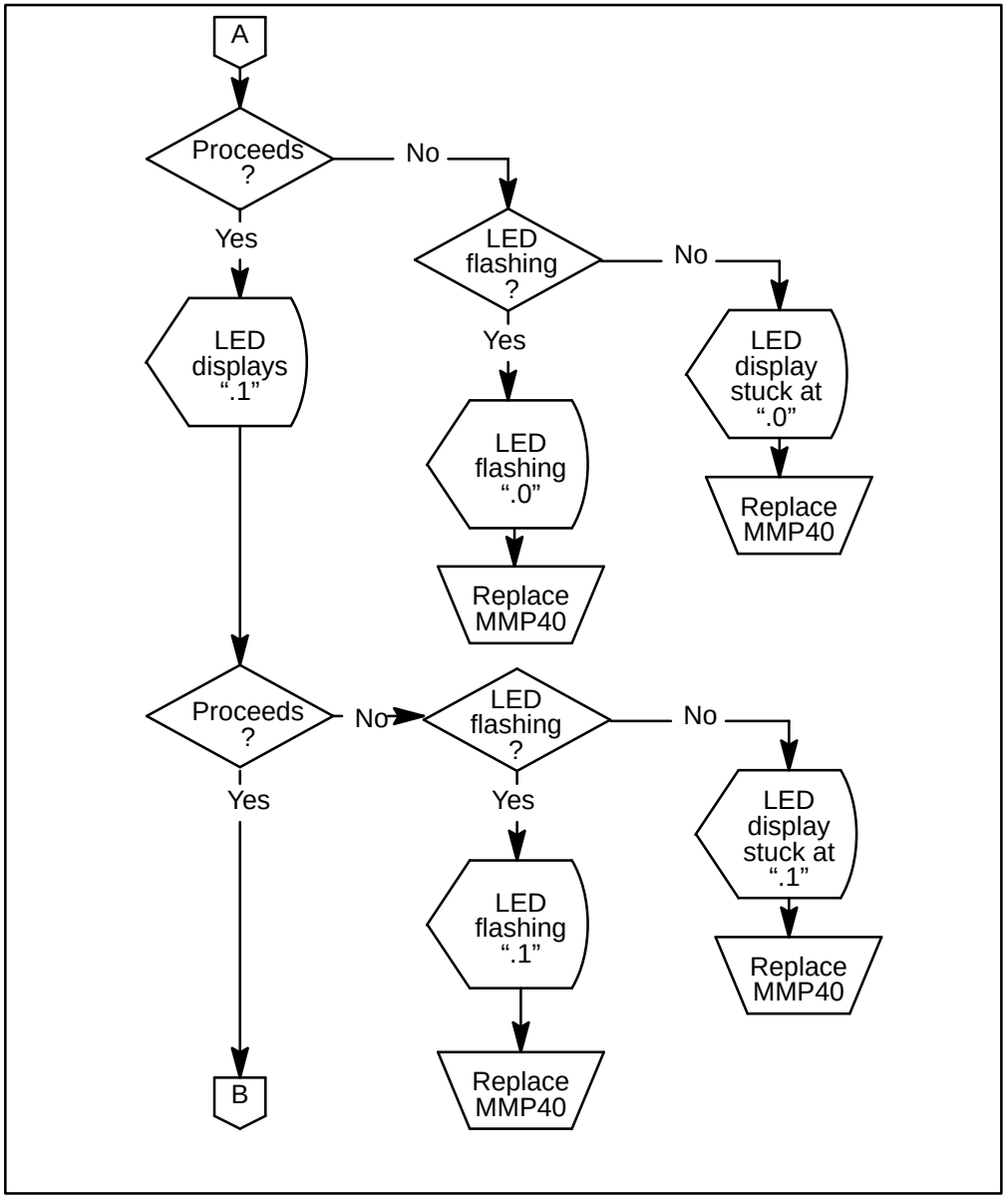


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

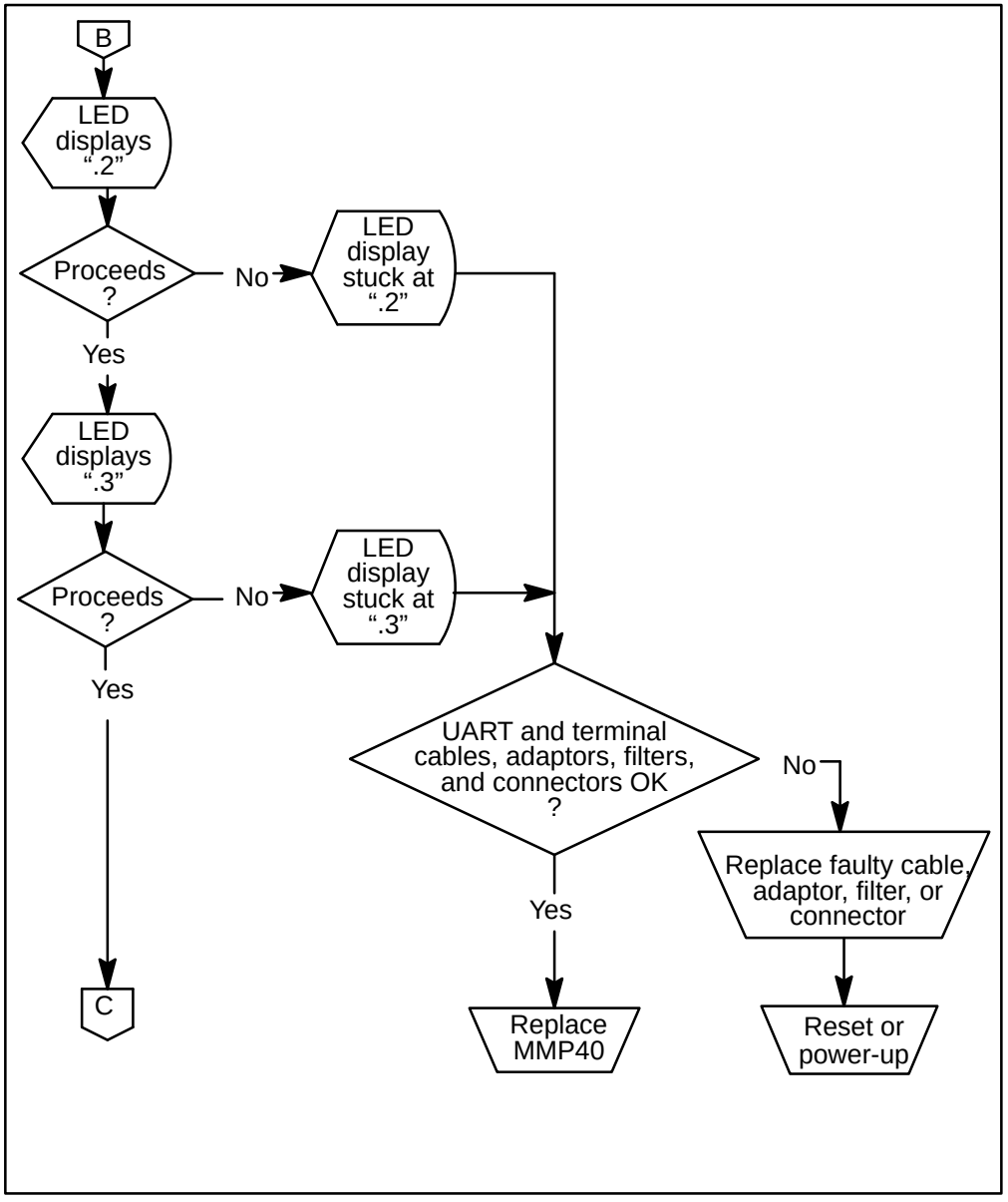


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

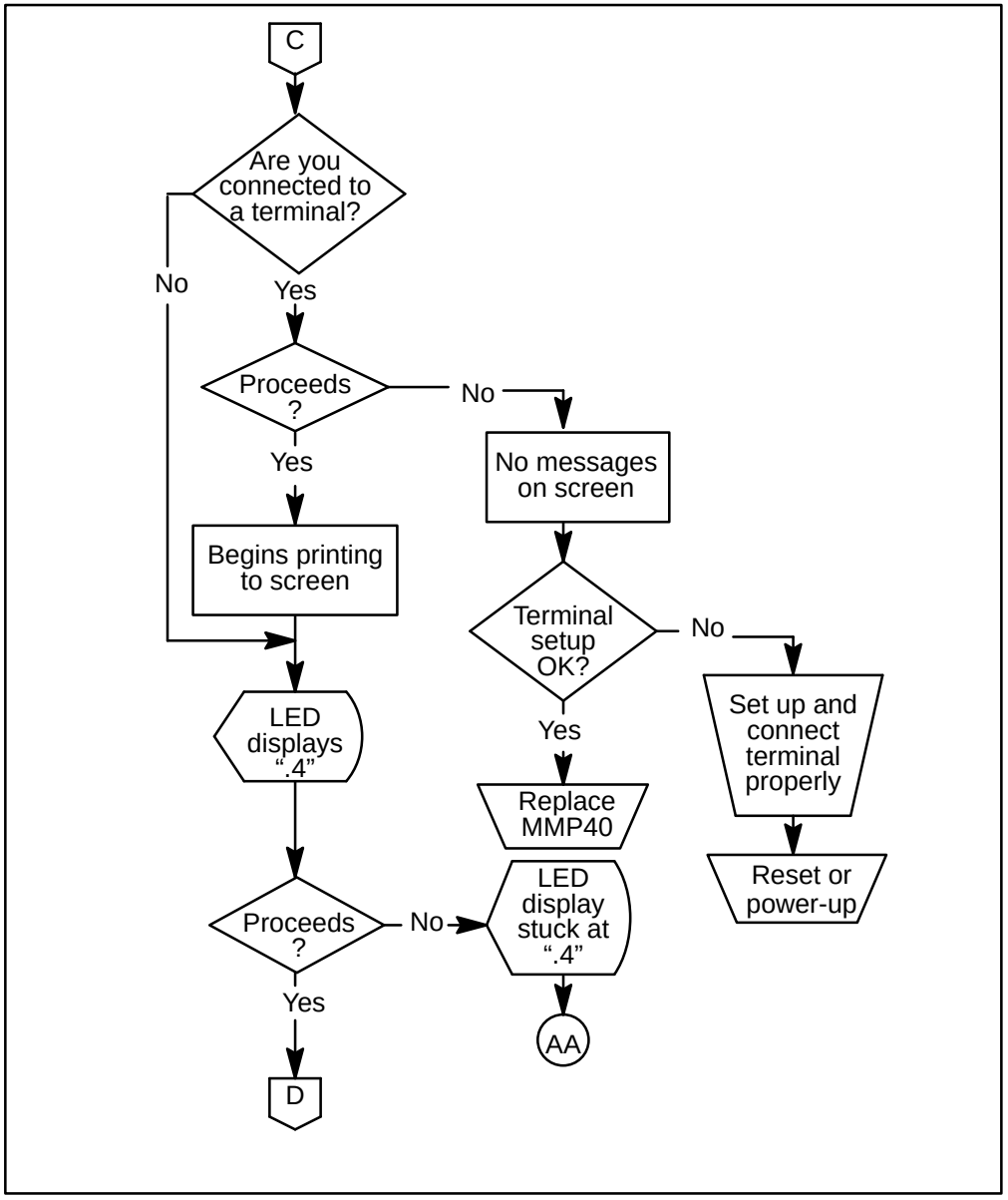


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

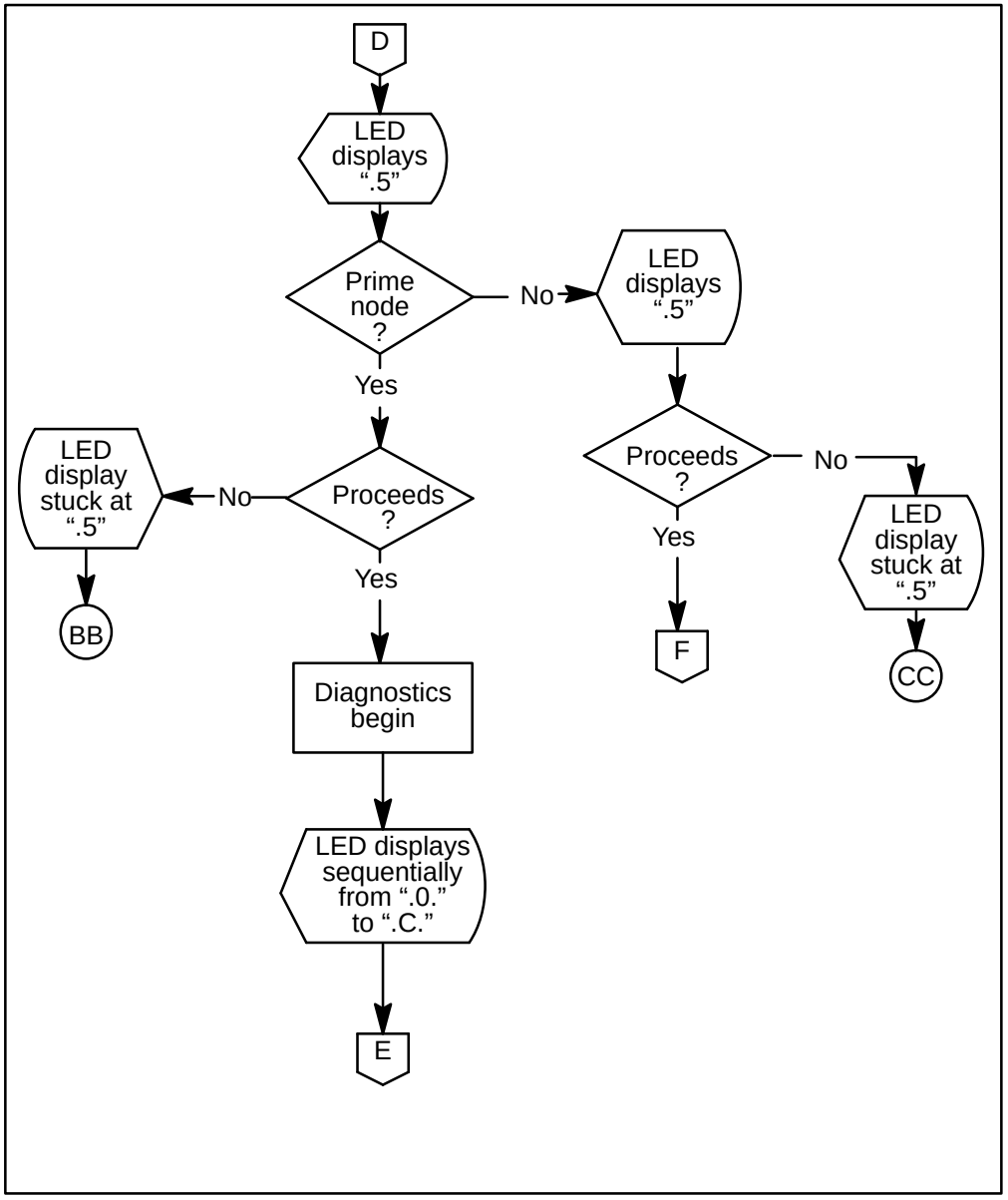


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

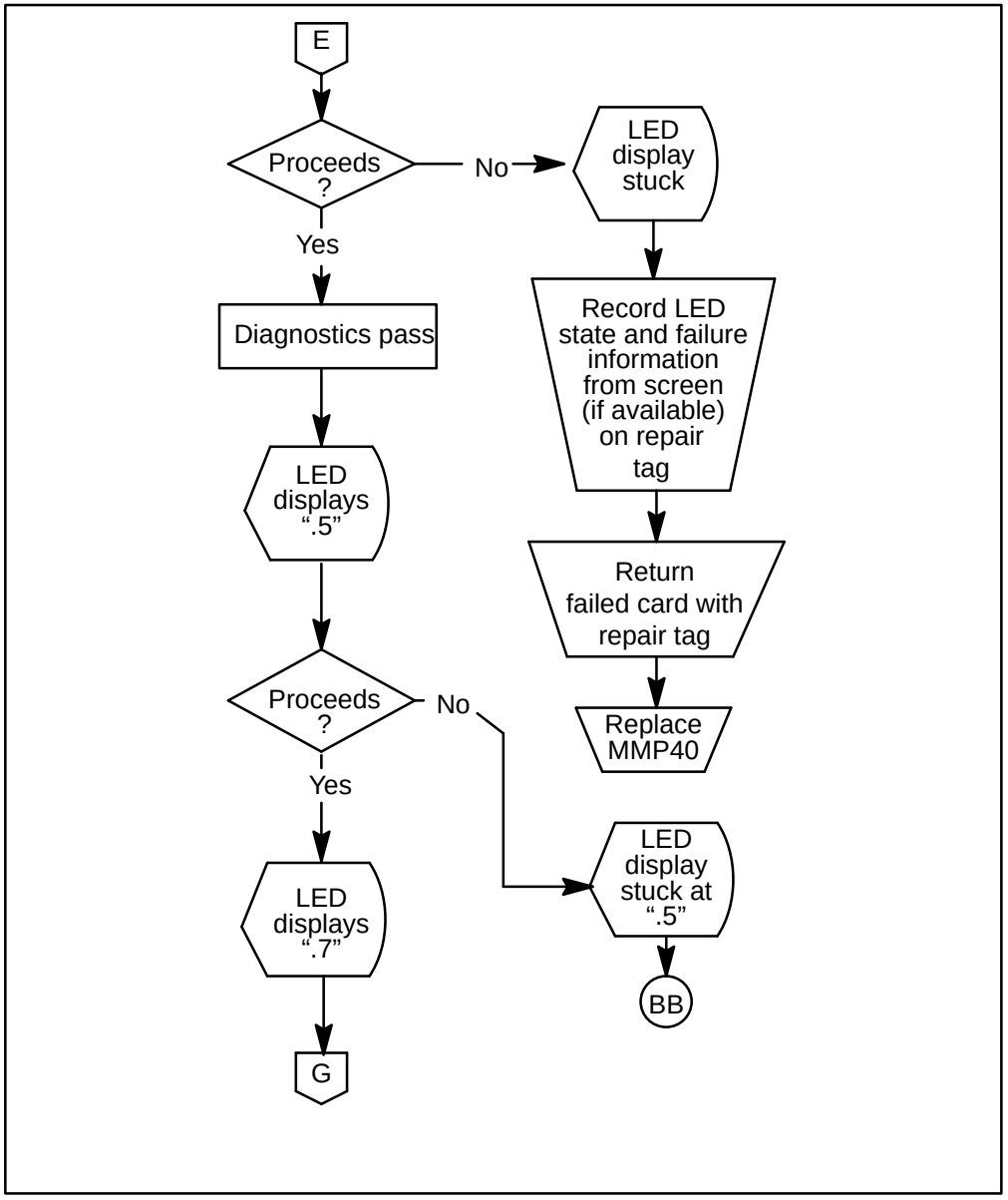


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

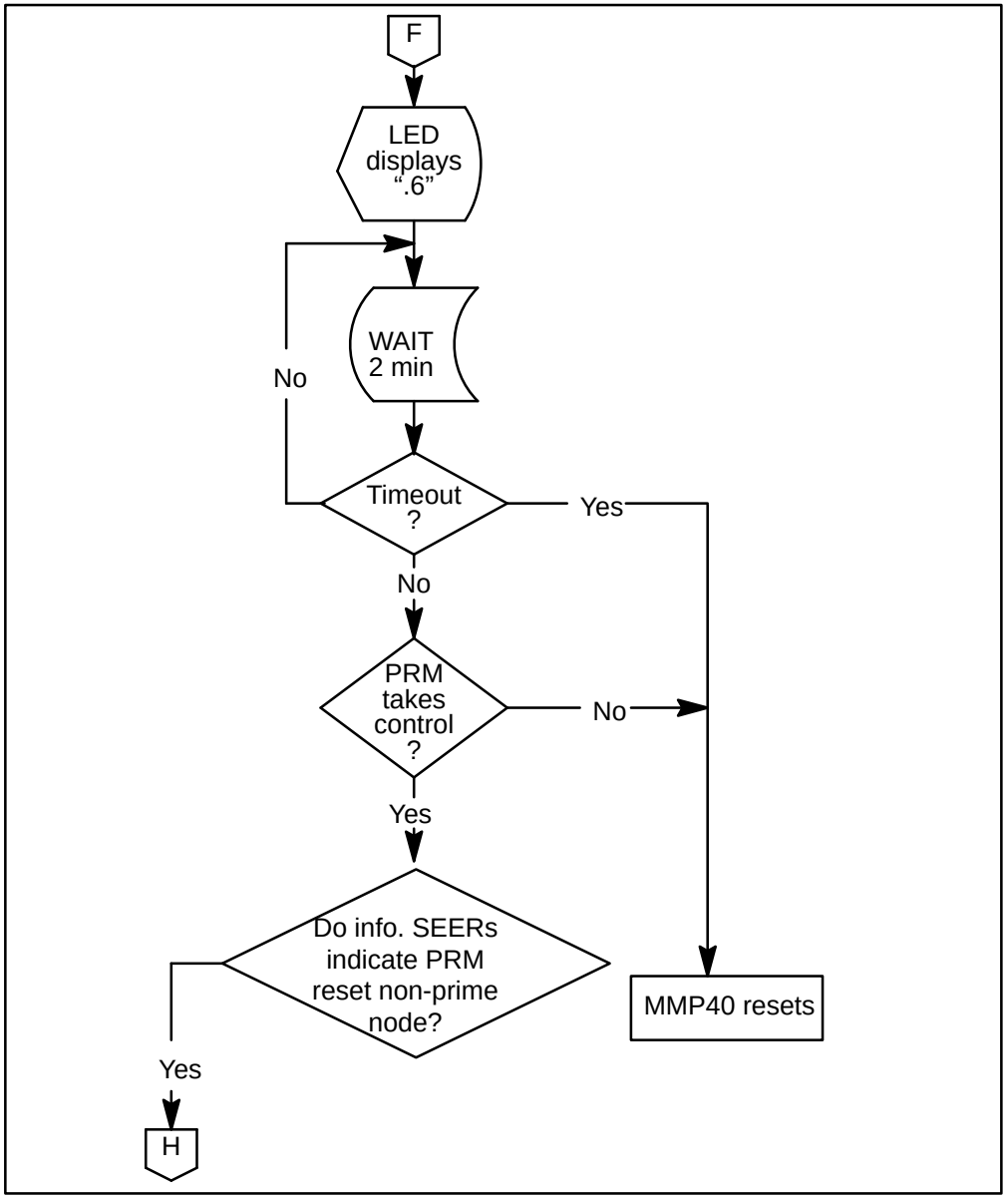


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

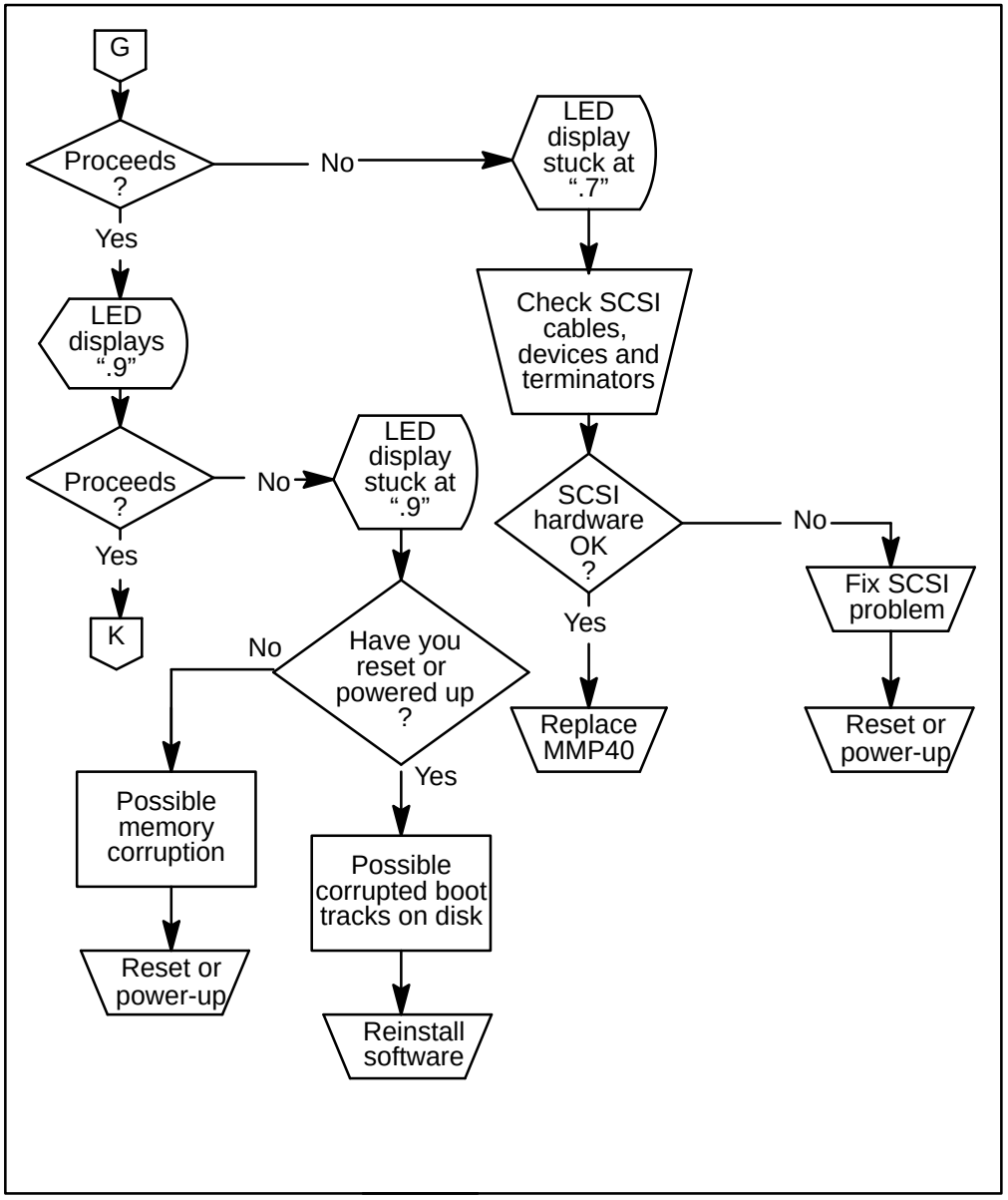


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

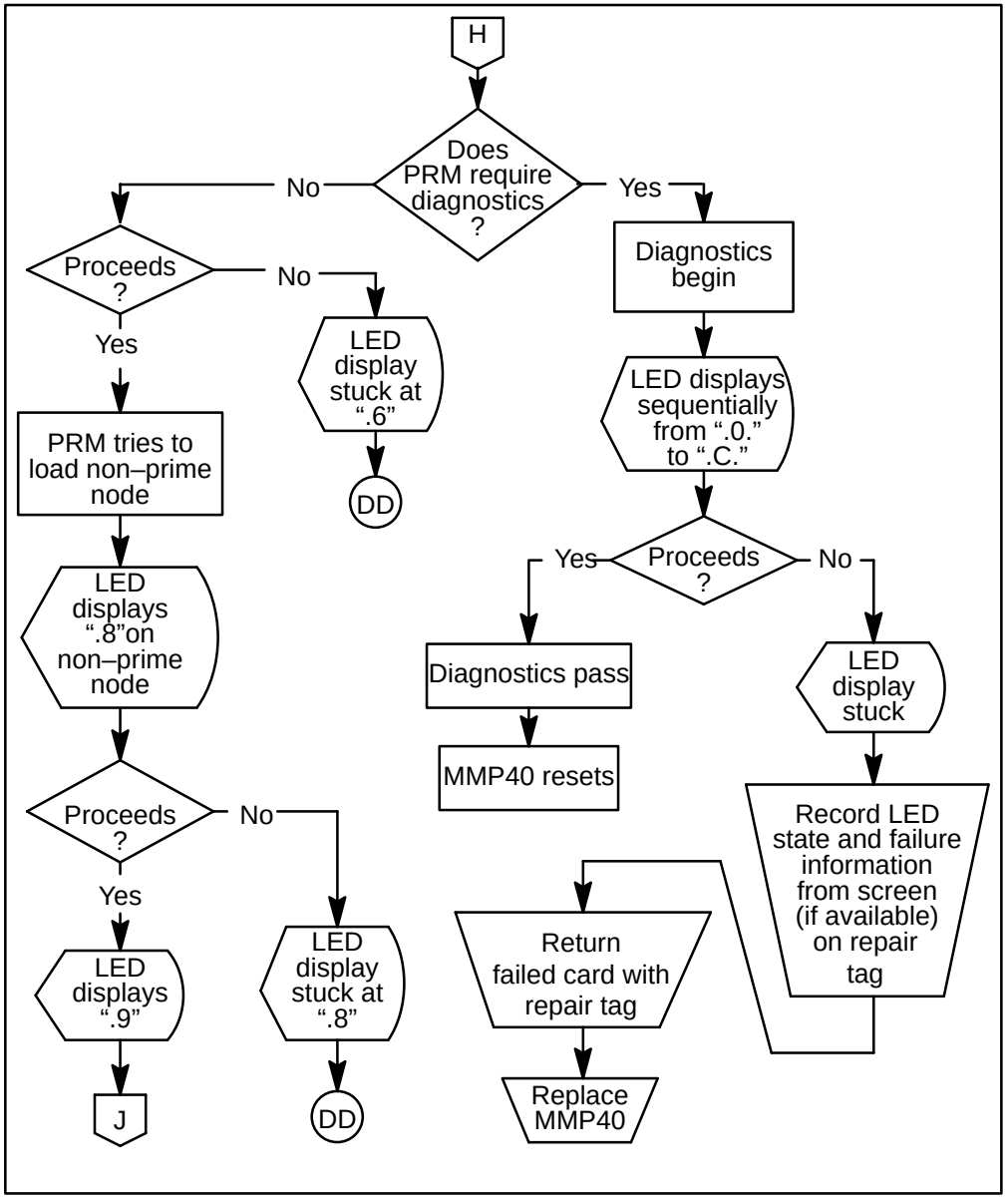


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

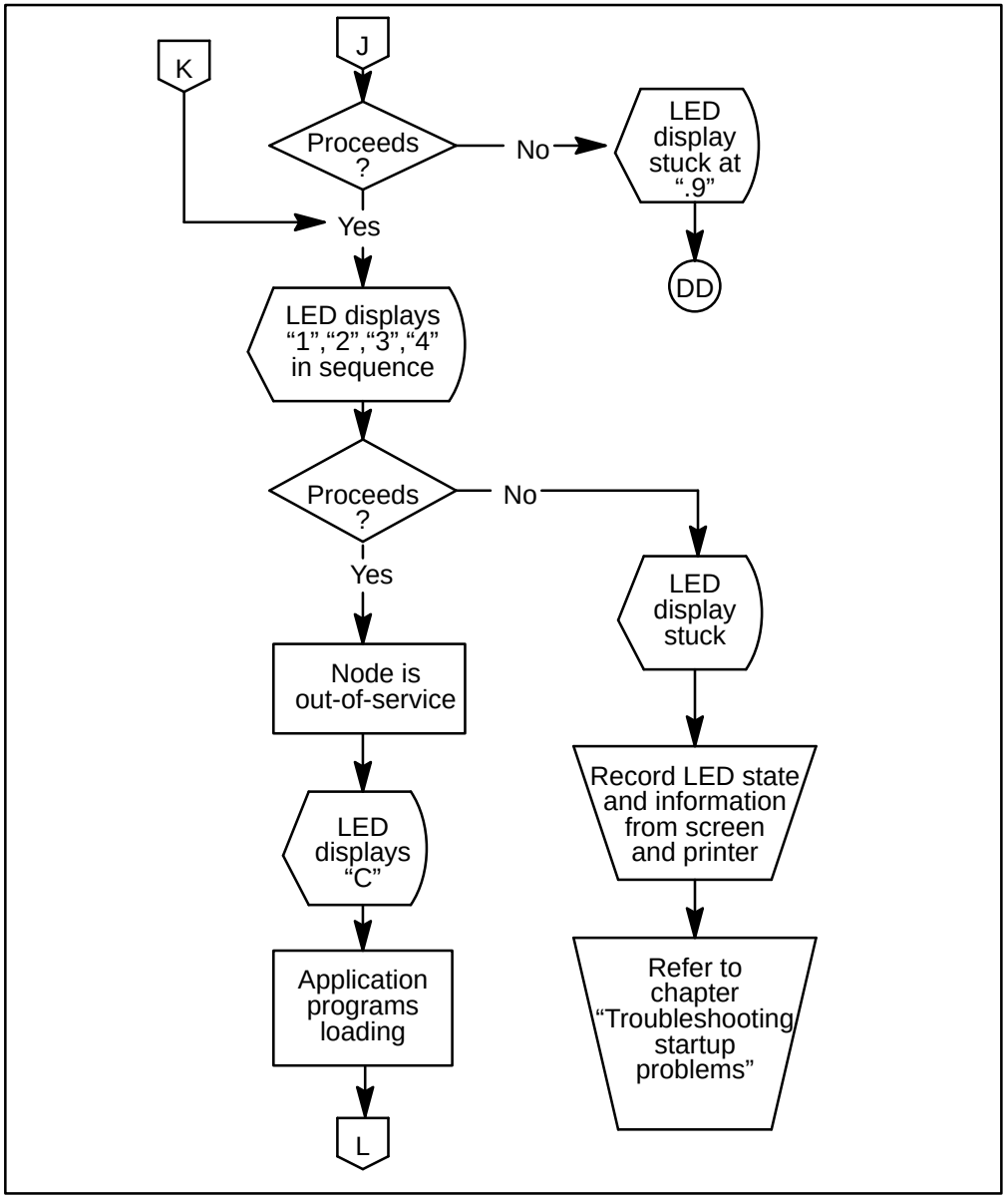


Figure 23-1 (continued)
MMP40 troubleshooting flowcharts

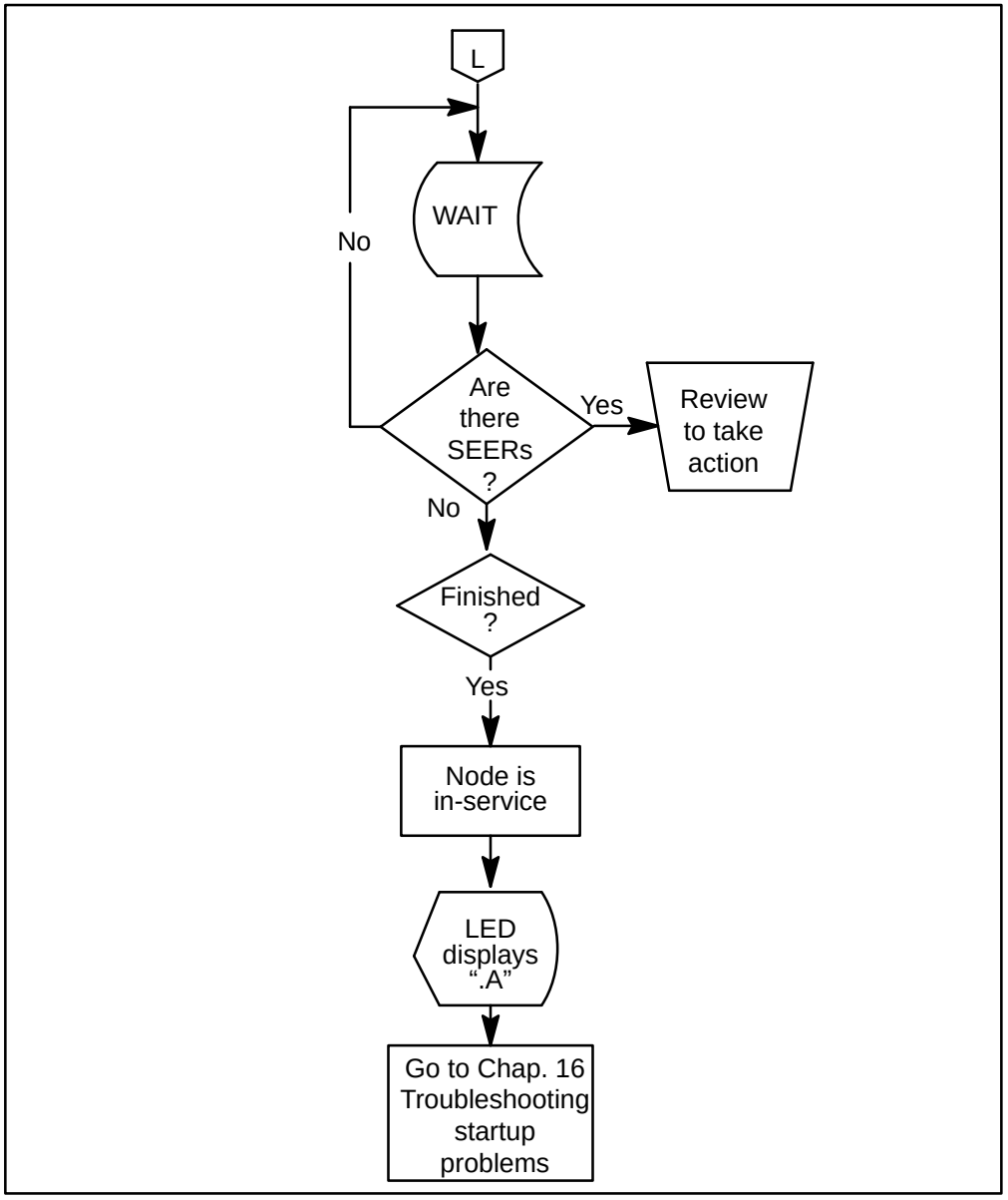


Table 23-1
AA – LED stuck at ".4"

Possible causes	Recovery action
Ctrl-B or BREAK key was pressed, or terminal was powered up during start-up 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.
MMP40 card may be faulty.	Record messages on screen. Replace MMP40 card.

Table 23-2
BB – LED stuck at ".5" (prime node)

Possible causes	Recovery action
Ctrl-B or BREAK key was pressed, or terminal was powered up during start-up sequence.	Reset or power-up node again.
MMP40 card may be faulty.	Record messages on screen. Replace MMP40 card.

Table 23-3
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 start-up 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.
MMP40 card may be faulty.	Record messages on screen. Replace MMP40 card.

Table 23-4
DD – LED stuck at ".6", ".8", or ".9" (non-prime node)

Possible causes	Recovery action
Prime node MMP40 may be faulty.	Record LED state and any SEERs. Replace prime node MMP40.
MMP40 card on non-prime node may be faulty.	Record LED state and any SEERs. Replace non-prime node MMP40.
Utility card may be faulty.	Replace faulty card.

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Reader's Response Form for

Meridian Mail Modular Option EC
***Installation and Maintenance Guide* (NTP 555-7061-250)**
August 1995

Tell us about yourself:

Name: _____ **Date:** _____

Company: _____

Address: _____

_____

Occupation: _____ **Phone:** _____

1. What is your level of experience with this product?

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2. How do you use this book?

   ❑ Learning ❑ Procedural ❑ Problem solving ❑ Reference

3. Did this book meet all of your needs?

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   If you answered **No** to this question, please answer the following questions.

4. What chapters, sections, or procedures did you find hard to understand?

   _____

   _____

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5. What information (if any) was missing from this book?

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6. How could we improve this book? (For example, books can also be evaluated in many other ways, including: ease of information retrieval, presentation, and use of reading aids, such as diagrams.)

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Reader's Response Form

Meridian Mail Modular Option EC

Installation and Maintenance Guide

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