

555-7041-250

Meridian Mail Modular Option

Installation and Maintenance Guide

Product release 10.0 Standard 1.0 August 1995

NORTEL

P0815509

Meridian Mail Modular Option

Installation and Maintenance Guide

Publication number: 555-7051-250
Product release: 10.0
Document release: **Standard** 1.0
Date: August 1995

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Publication history

August 1995

Manual released as Standard 1.0. This version documents Release 10.0 Meridian Mail installation and maintenance procedures for the Meridian Mail Modular Option system. This edition makes all previous editions obsolete.

April 1995

Manual released as Standard 1.0. This version documents Release 9.5 Meridian Mail installation and maintenance procedures for the Meridian Mail Modular Option.

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About this document

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

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

There is also a chapter on how to program the switch to recognize newly added loops and/or ports, and to communicate command and status information to Meridian Mail.

The "Troubleshooting" section provides tables for fast identification of a problem and procedures for problem correction.

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

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

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

- Meridian Mail backplane assembly
- cable harnesses

Tools required

Have the following tools at hand for general maintenance purposes:

Tool	Description
Slotted screwdriver	small, 4.76 mm (3/16-inch)
Carpenter's level	
Phillips screwdriver	small, stubby
Phillips screwdriver	medium
Socket wrenches	6.35, 7.94, and 14.29 mm (1/4, 5/16 and 9/16 inch)
Multimeter	
9 - 25-pin adapter cable	NT product number NT4R60AA (for monitoring node expansion)
ESD wrist strap	

Chapter 1: Preparing for installation

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

Tools required

Have the following tools at hand before beginning the installation:

Tool	Description
Slotted screwdriver	small, 4.76 mm (3/16 inch)
Wire strippers	
Wire cutters	
BIX connector tool	NT product number GYB1X16
Carpenter's level	
Phillips screwdriver	small, medium
Socket wrenches	6.35, 7.94, and 14.29 mm (1/4, 5/16, and 9/16 inch)
Hammer	
Flashlight	
9-25-pin adapter cable	NT product number NT4R60AA (for monitoring node expansion)
ESD (electro-static discharge) wrist strap	

Other documents referenced in this document

Installation procedures for some of the components of this system require you to refer to additional documentation. For example, installation of the Universal Equipment Modules asks you to refer to the Meridian 1 Installation procedures.

1-2 Preparing for installation

Documents referenced in this manual are listed below in Table 1-1.

Table 1-1
Referenced documents and NTP numbers

Reference document name	NTP number
<i>SL-1 Features and Services Practice</i>	553-2301-105
<i>SL-1 Maintenance Manual</i>	553-2301-511
<i>NT6D82 Power System; Description, installation, and maintenance</i>	553-3001-110
<i>SL-1 System Installation Planning</i>	553-3001-120
<i>SL-1 System Installation Procedures</i>	553-3001-210
<i>Circuit Card Installation and Testing</i>	553-3001-211
<i>X11 Input/Output Guide</i>	553-3001-400
<i>Meridian Mail Master Index</i>	555-7001-000
<i>System Installation and Modification Guide</i>	555-7001-215
<i>Meridian Mail System Administration Guide</i>	555-7001-301
<i>Meridian Mail System Administration Guide for Multi-Customer Systems</i>	555-7001-302
<i>System Administration Tools</i>	555-7001-305
<i>Meridian Mail Maintenance Messages (SEERS) Guide</i>	555-7001-510

Chapter 2: Meridian Mail assembly overview

This chapter summarizes the steps required to install a Meridian Mail system or expand an existing system by adding a node (refer to Table 2-1). Because Meridian Mail is housed in a Universal Equipment Module (UEM), you will need the appropriate Meridian 1 documentation to install this part of the system. The manuals you need to install the UEM are listed in Chapter 4, "Installing a column or a module."

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

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

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

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

**WARNING****Risk of electrocution**

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

2-2 Meridian Mail assembly overview

Table 2-1
Installation task list

Procedure	Reference
Unpack and inspect equipment	Chapter 3
If necessary, install Meridian Mail columns, including power and grounding, and earthquake protection. Install Meridian Mail modules.	Chapter 4
Install the power supplies and disks	Chapter 5
Prepare for system migration if necessary.	Chapter 6
Install the printed circuit packs and associated cables	Chapter 7
Perform diagnostics and software expansion for node expansion	Chapter 8
Install the Meridian Mail to PBX interface	Chapter 9
Install and configure peripheral devices	Chapter 10
Configure the Meridian 1	Chapter 11
Start up, configure, and acceptance test Meridian Mail	Chapter 12

Chapter 3: Unpacking and inspecting the Meridian Mail equipment

Procedure 3-1 describes the steps required to unpack and inspect the Meridian Mail equipment to make sure all the components are present.

**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 3-1**Unpacking and inspecting the Meridian Mail equipment**

- 1 If equipment is mounted on a shipping pallet, follow unpacking instructions provided with the packaging material, and remove equipment from the pallet.
- 2 Cut any remaining strapping and/or tape.
- 3 Remove 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 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.

3-2 Unpacking and inspecting the Meridian Mail equipment

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

- 5 Check all items delivered against the order form and the packing slip. Report any errors or omissions to your supplier.
See "Appendix A" in Meridian Mail Modular Option Site and Installation Planning Guide (NTP 555-7041-200) for a list of part numbers.
- 6 Repack the hardware components in their boxes until you are ready to install the system.
- 7 Place the module(s) in a safe, dry location in the equipment room close to the final location.
- 8 Remove the preinstalled printed circuit packs from each new module, following Procedure 3-2, and check for any loose parts, broken edges, and any other obvious damage to the component.



CAUTION

Risk of equipment malfunction

Take care to return each card to the module and the slot where it came from. Although the voice processor cards in the VP/GSP slots appear to be identical, they have different switch settings from each other. It is strongly recommended that each be returned to its own slot.

- 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.

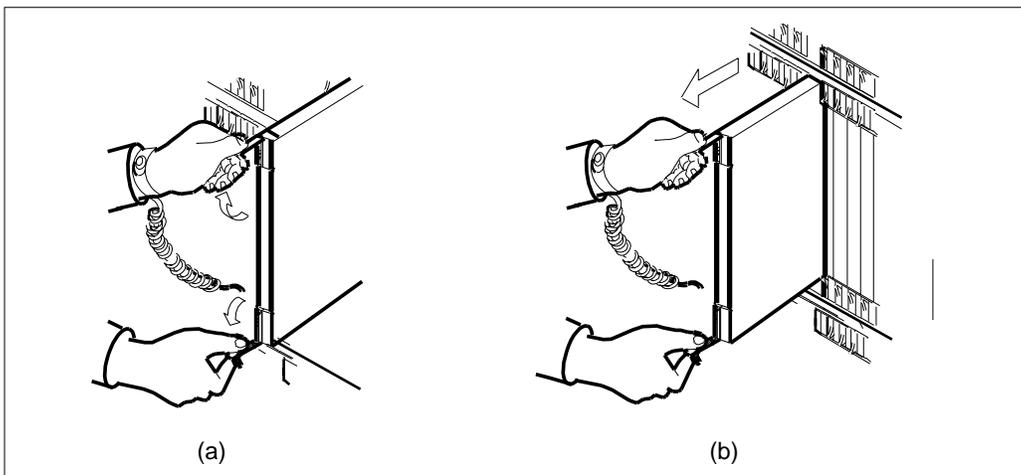
Procedure 3-2

Removing and reinstalling printed circuit packs

- 1 Open the ejectors on the pack, and gently pull the pack towards you until it clears the shelf. (See Figure 3-1).
- 2 Check the pack to make sure it is not bent and there are no loose parts.

- 3 Replace the pack in the module by aligning it with the slots in the module, ejectors still in the open position, and gently sliding the pack back into the module.
- 4 Seat and lock the pack:
 - a. Push on the upper and lower edges of the front of the pack to ensure that the pack is fully seated in the module.
 - b. Close the ejectors.

Figure 3-1
Printed circuit pack removal



3-4 Unpacking and inspecting the Meridian Mail equipment

Chapter 4: Installing a column or a module

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

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

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

Installing a column

Procedure	Reference
Install Meridian Mail columns	<i>SL-1 System Installation Procedures</i> (NTP 553-3001-210); Chapter: "Introduction," section: "Equipment handling precautions" except for the part on "Data disks"
Install earthquake protection, if needed	<i>SL-1 System Installation Procedures</i> (NTP 553-3001-210); Chapter: "Installing earthquake bracing"
Position and level the equipment	<i>SL-1 System Installation Procedures</i> (NTP 553-3001-210); Chapter: "Positioning and levelling equipment"
-continued-	

4-2 Installing a column or module

Procedure	Reference
Install AC grounding and power (AC-powered system)	<i>SL-1 System Installation Procedures</i> (NTP 553-3001-210); Chapter: "Installing AC power" NT6D82 Power System; Description, installation, and maintenance (NTP 553-3001-110)
Install DC grounding and power (DC-powered system)	<i>SL-1 System Installation Procedures</i> (NTP 553-3001-210); Chapter: "Installing DC power" NT6D82 Power System; Description, installation, and maintenance (NTP 553-3001-110)
-end-	

Installing a module

Procedure	Reference
Install each Meridian Mail module	<i>SL-1 System Installation Procedures</i> (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 shadowed node, install the backplane stiffener as described in this chapter before reconnecting the power and system monitor cables. If you are installing a shadowed voice node, install the load resistor as described in this chapter before reconnecting the power and system monitor cables. Note 3: If you are installing a module in a DC system, you cannot set power supply switches ON as instructed at the end of "Adding a module to a column" because you have not yet installed the power supplies. If you are installing a module in an AC system, leave the shelf breakers in the OFF position.

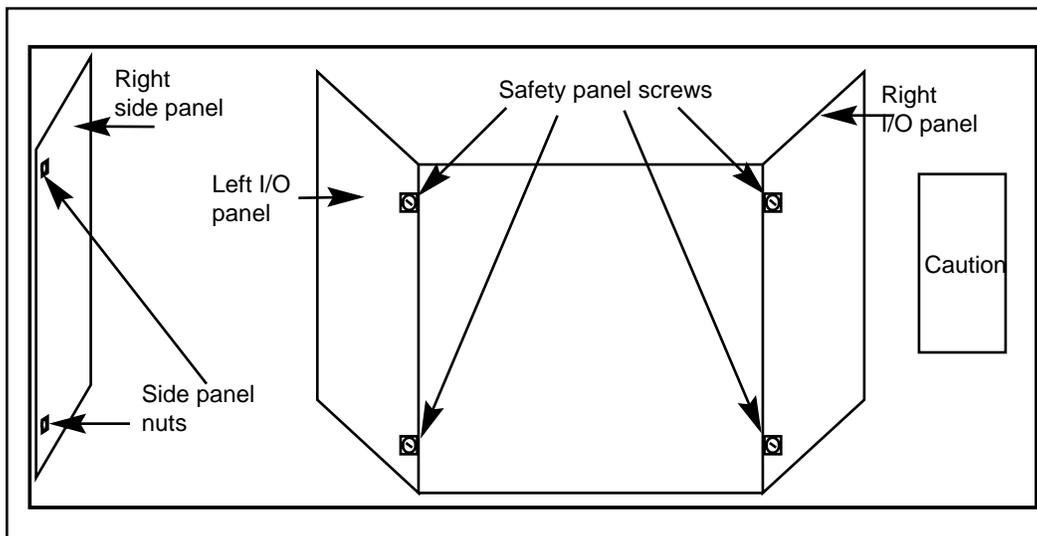
Module doors, side panel, and safety panel

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

You also need to remove the right side panel (as seen from the front) from each new module, and from each module on top of which you are adding a module. See Figure 4-1 for the location of the side panel nuts at the rear of the module. There are similarly located nuts at the front. Remove all four nuts to free the side panel.

Remove the rear safety panel from each new module by turning the screws one-quarter turn anti-clockwise. See Figure 4-1 for the location of the screws at the rear of the module.

Figure 4-1
Safety panel and side panel screw locations-rear of module



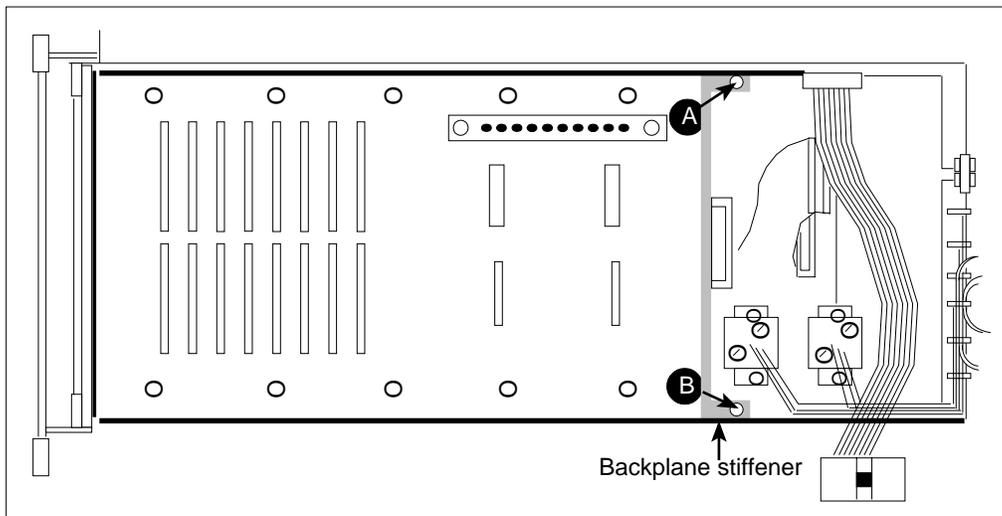
Installing the backplane stiffener

You need to install a backplane stiffener on each disk-shadowed node before you reconnect the power and system monitor cables (see Procedure 4-1).

Procedure 4-1 Installing the backplane stiffener

- 1 If you are installing the backplane stiffener in the top module that contains the temperature sensor, proceed as follows:
 - a. Gently remove the sensor.
 - b. Disconnect the power plug and sensor plug, and gently bend the bracket that holds the power plug so that you can get access to the screw at A in Figure 4-2.

Figure 4-2
Backplane stiffener location



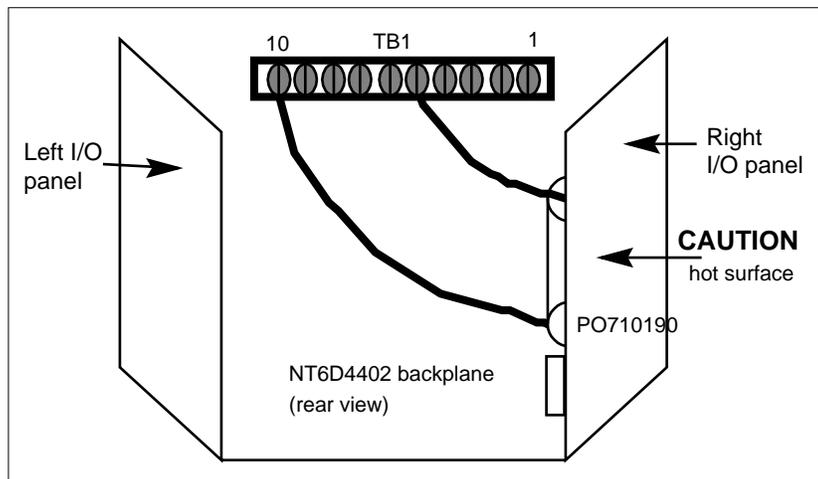
- 2 Remove the screws on the backplane at locations marked A and B in Figure 4-2. Note whether they are machine threaded or not.
- 3 Position the backplane stiffener so that the holes in the flat extensions on the stiffener line up with the screw holes on the module.

- 4 Using the screws supplied with the stiffener, secure the stiffener tightly to the module, making sure all cables are clear. If the screws removed in step 2 are machine threaded, use the machine-threaded screws supplied. Otherwise, use the self-tapping screws.
- 5 Reinstall the temperature sensor if it has been removed.
- 6 Reconnect the power plug and sensor plug if they have been removed.

Installing the load resistor

You need to install a load resistor on each disk-shadowed voice node before you reconnect the power and system monitor cables (see Procedure 4-2). The resistor is mounted on replacement side panel (P0710190) and is connected to the power terminal block (TB1).

Figure 4-3
Load resistor for disk shadowed voice nodes



Procedure 4-2

Installing the load resistor

- 1 Remove the existing right side I/O panel (see Figure 4-3).
- 2 Install the new side panel (P0710190) in its place.
- 3 Connect the two wires from the resistor to terminal block TB1 connectors 5 and 10 on the backplane.

Identifying nodes

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

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

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

Chapter 5: Inspecting and installing the power supplies and mass storage units

Power supplies

The following procedures describe the installation of the power supplies.

**DANGER****Risk of electrocution**

AC system - ensure that shelf breakers are OFF before installing power supplies.

DC system - ensure that power supply switches are OFF before installing power supplies.

Location of power supplies

Unshadowed node

- A voice node needs a power supply in the left Common Equipment Power Supply (CEPS) slot.
- A prime node needs power supplies in the left and right CEPS slots.

Shadowed node

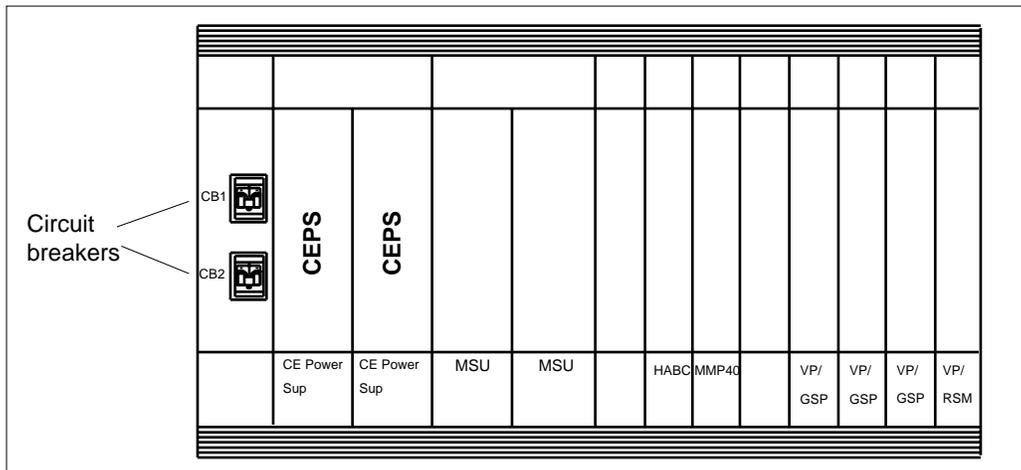
- A shadowed node, either prime or voice, needs power supplies in the left and right CEPS slots.

AC system

Procedure 5-1 Installing the CEPS

- 1 Verify that the power to the Meridian Mail module is off. Use the circuit breakers shown in Figure 5-1.
- 2 Open the ejectors and align the power supply with the appropriate CEPS slot in the module. Refer to Figure 5-1.
- 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.
 - a. If they do, turn power off again.
 - b. If they do not, follow the procedures in Chapter 13, "Troubleshooting startup problems."

Figure 5-1
Location of CEPS

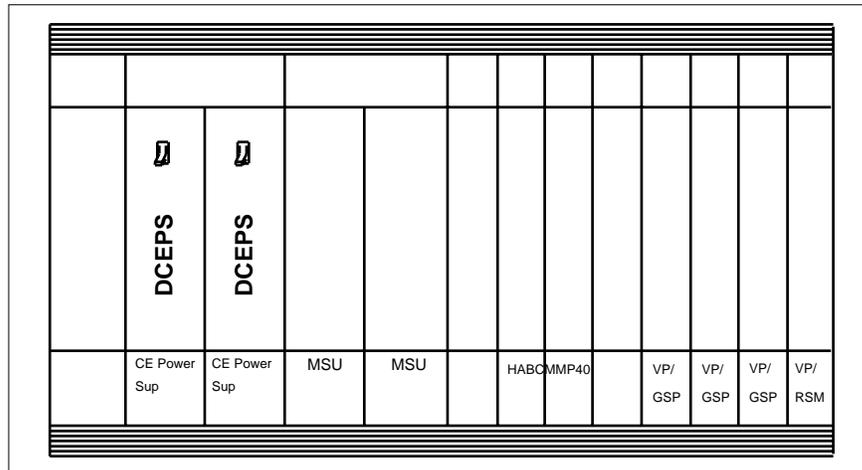


DC system

Procedure 5-2 Installing the DCEPS

- 1 Verify that the switches on the DC Common Equipment Power Supply (DCEPS) are off.
- 2 Open the ejectors and align the power supply with the appropriate CEPS slot in the module. Refer to Figure 5-2.
- 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.
 - a. If they do, turn power off again.
 - b. If they do not, follow the procedures in Chapter 13, "Troubleshooting startup problems".

Figure 5-2
Location of DCEPS



Overview of disk drives

The disk units used in Meridian Mail are shown in Table 5-1. Each Meridian Mail disk drive is mounted in a Mass Storage Unit (MSU) cage. The NT designation and the A0 product code applies to the drive in its cage, and not to a "bare" drive.

Table 5-1
Disk and disk/tape assemblies

Assembly number/ common product code (CPC)	Title of assembly	Models included	Individual disk drive CPC
NT6D47BA / A0393283	300-Mbyte Hard disk unit	Maxtor LXT340SY	A0351371
		Seagate ST3390N	A0602257
NT6D47DA / A0398354	300-Mbyte disk and 250-Mbyte tape	Seagate ST5660	A0616840
		Seagate ST3390N	A0602257
		Maxtor LXT340SY	A0351371
NT6D48AA / A0365883	600-Mbyte Hard disk module	Maxtor XT8760S	A0354197
NT6D48DA / A0398355	1-Gbytedisk and 250-Mbyte tape	DEC DSP3105 or DSP3107	A0383809
		Seagate ST11200N	
		Maxtor MXT1240	
		Seagate ST31230N	A0616792
		DEC DSP3107	
NT6D48BA / A0393284	1.2-Gbyte Hard disk unit	DEC DSP3105 or DSP3107	A0383809
		Seagate ST11200N	
		Seagate MXT11200N	
		DEC DSP3107	A0616792
		Seagate ST31230N	
NT6D48EA / A0629940	1.0-Gbyte disk and 2.5-Gbyte tape	Seagate ST31230N	A0616792

Disk or disk/tape unit installation

The following procedure shows you how to install the disk or disk/tape unit in a Meridian Mail node. Nodes have different combinations of disk, tape, and disk/tape units according to whether they are shadowed and whether they are prime or voice.

Table 5-2
Node combinations: shadowed/unshadowed

Shadowed	prime	L) primary disk mounted with tape R) secondary disk
	voice	L) primary disk R) secondary disk
Unshadowed	prime	L) primary disk R) tape
	voice	L) primary disk

where "L"= Left and "R" = Right



CAUTION
Risk of equipment damage

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

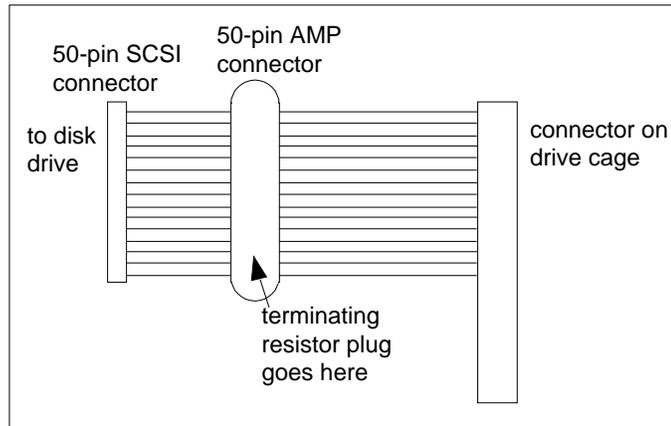
Note 1: There are slight variations on these disk drives, so your disk drive may not look exactly like the ones pictured here (even though the model number is the same).

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

5-6 Inspecting and installing the power supplies and mass storage units

Note 3: The disk drives must have their 'onboard' terminator resistors removed. Primary drives (except node 1), which require terminating resistors, have an external resistor plug installed on the 50-pin AMP connector on the SCSI cable between the disk drive and the back of the drive cage. See Figure 5-3.

Figure 5-3
SCSI cable external terminating resistor plug



Procedure 5-3 **Installing the disk or disk/tape unit**

- 1 Ensure that the disk or disk/tape unit has the correct PEC including suffix. It must be the same as the one on your packing slip.
- 2 Confirm the jumpers and terminators on the disk drive according to Figures 5-5 to 5-13. See also Table 5-3.

Table 5-3
Disk slots, SCSI IDs, and terminators

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

- 3 Verify that the power to the Meridian Mail module is off. For a DC system, use the switches on the DCEPS shown in Figure 5-4. For an AC system, use the shelf breakers shown in Figure 5-1.
- 4 Open the locking levers and align the disk unit with the appropriate MSU slot in the module (refer to Figure 5-4 for MSU slot location). Gently slide the unit into the slot pushing on the upper and lower edges to ensure that the unit is fully seated in the module.
- 5 Close the locking levers.

For further information on disk shadowing, see Chapter 12, Procedure 12-2, "Enabling/disabling disk shadowing."

Figure 5-4
MSU slot location

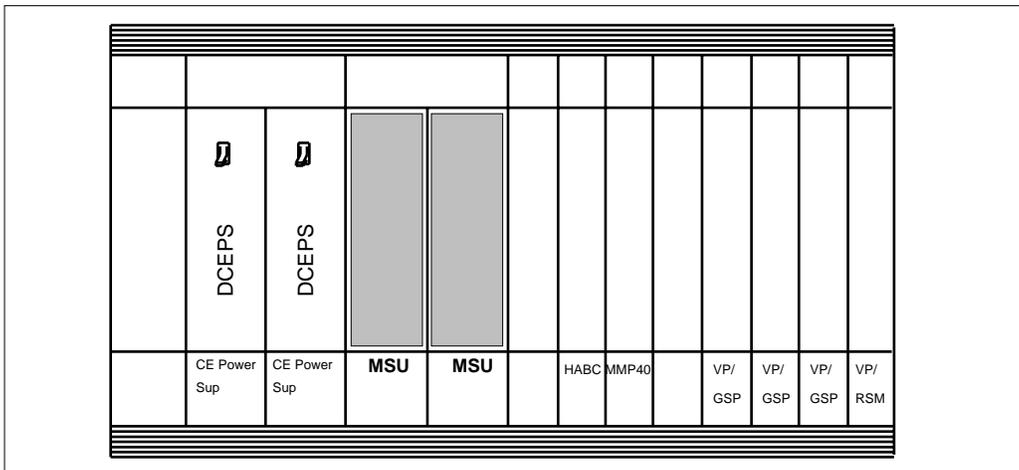
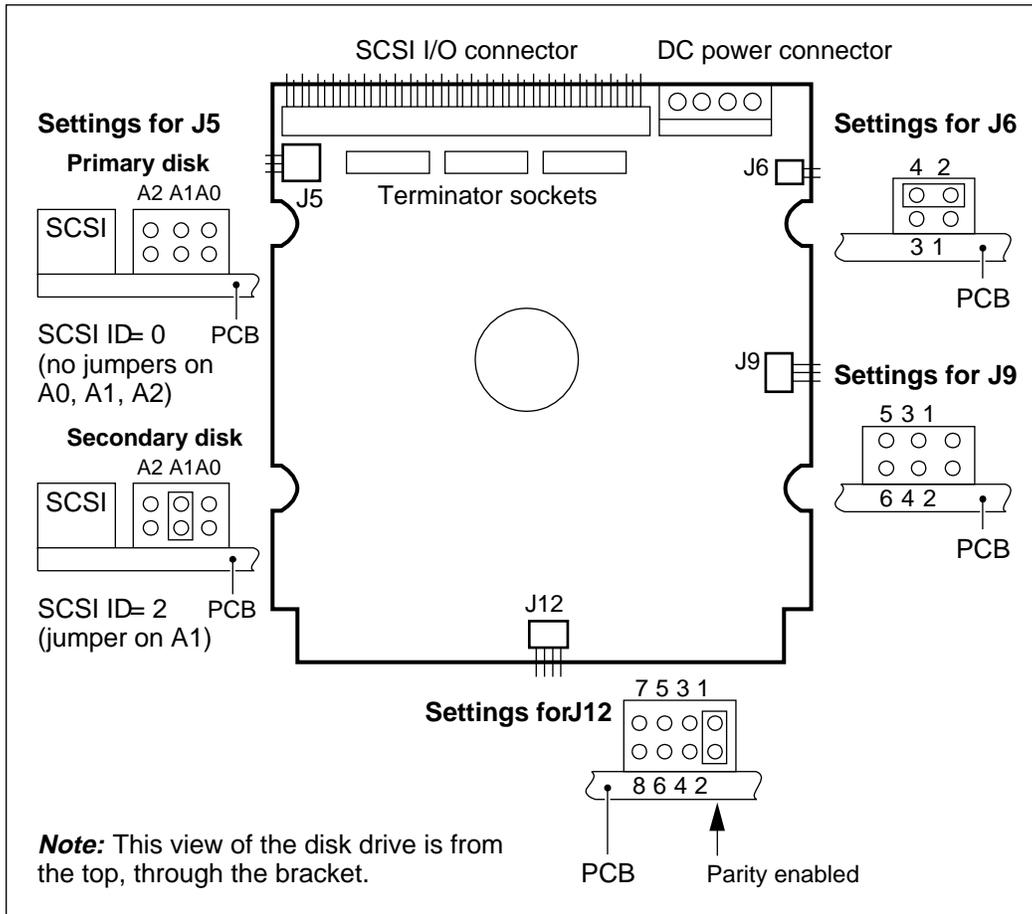


Figure 5-5
300-Mbyte Seagate ST3390N disk drive connectors and jumper settings



Note: Terminators are removed.

Figure 5-6
300-Mbyte Maxtor LXT340SY disk drive connectors and jumper settings

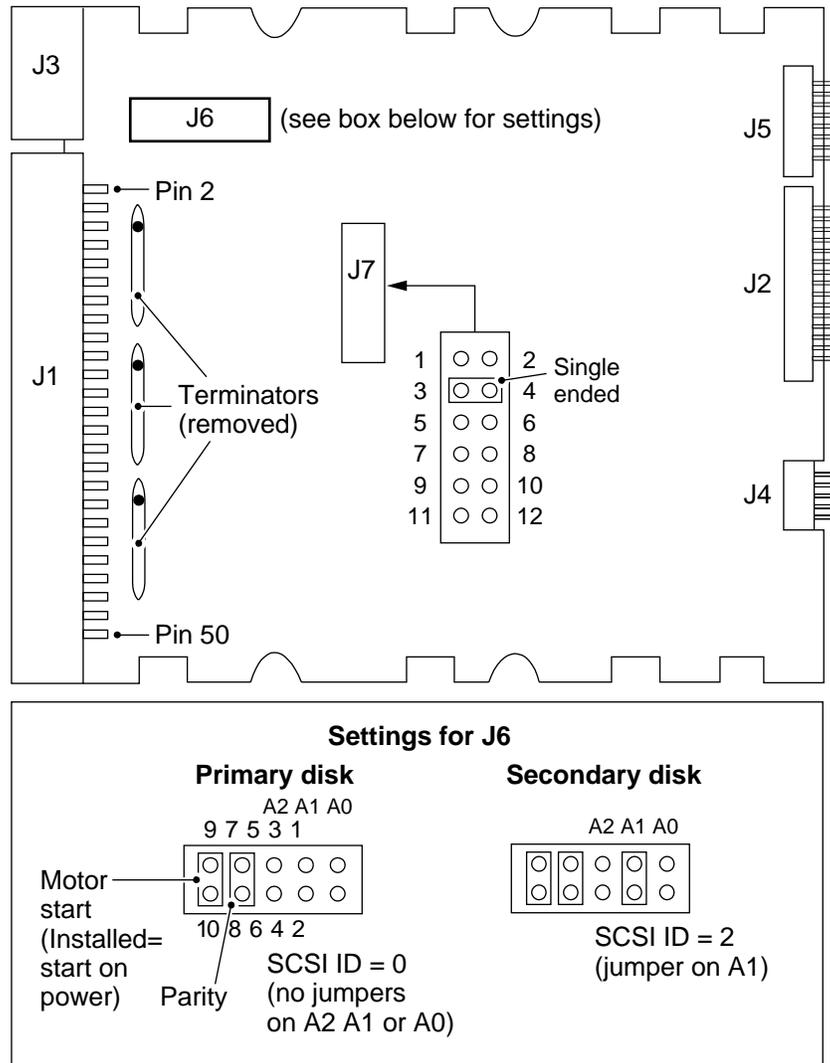
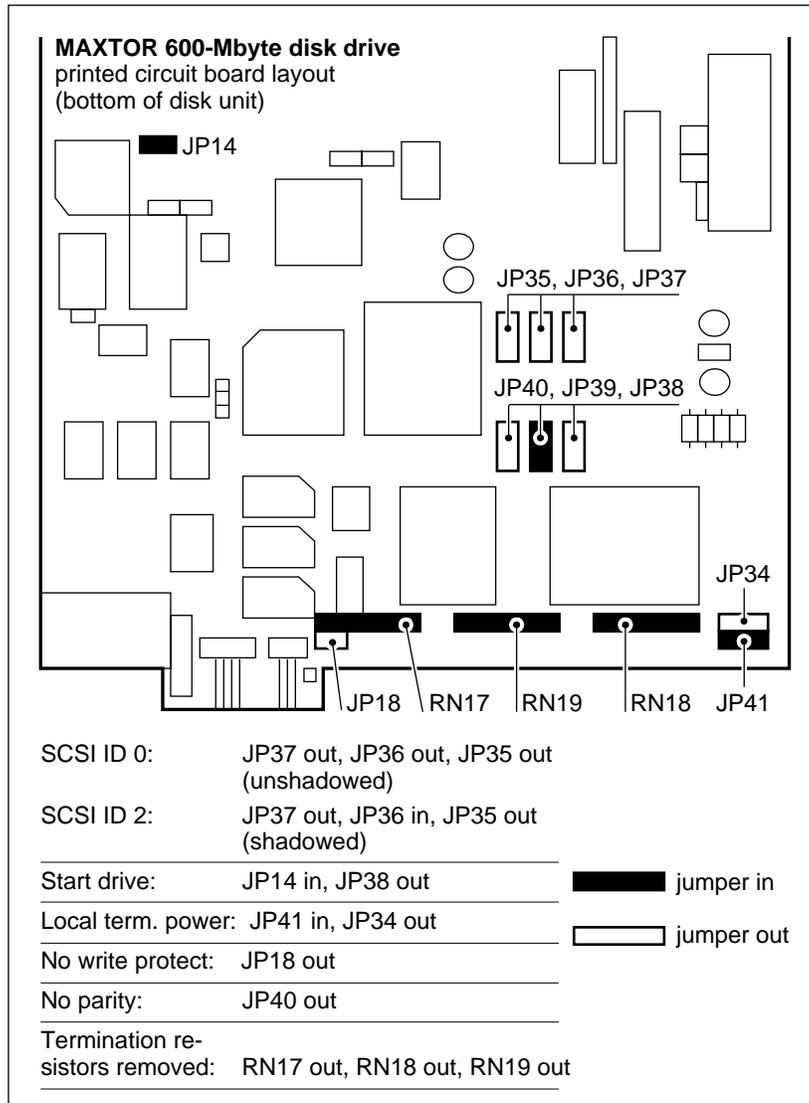


Figure 5-7
600-Mbyte Maxtor/Sequel XT8760S disk drive connectors and jumper settings



Note: Parity should be enabled. Set JP40 to "in."

Figure 5-8
1.0-Gbyte Seagate ST11200 disk drive connectors and jumper settings

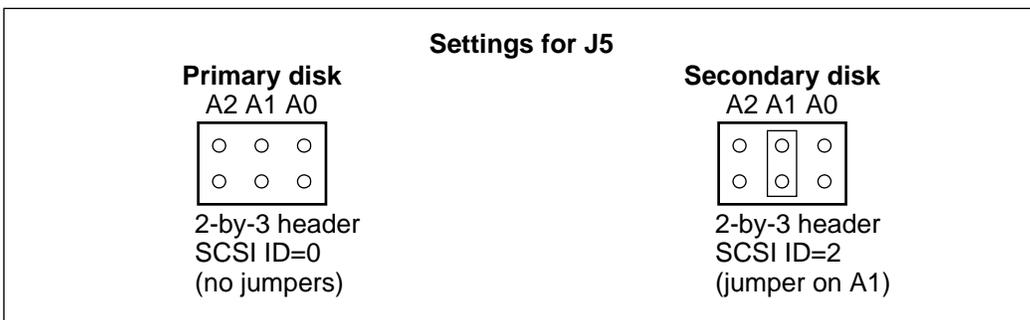
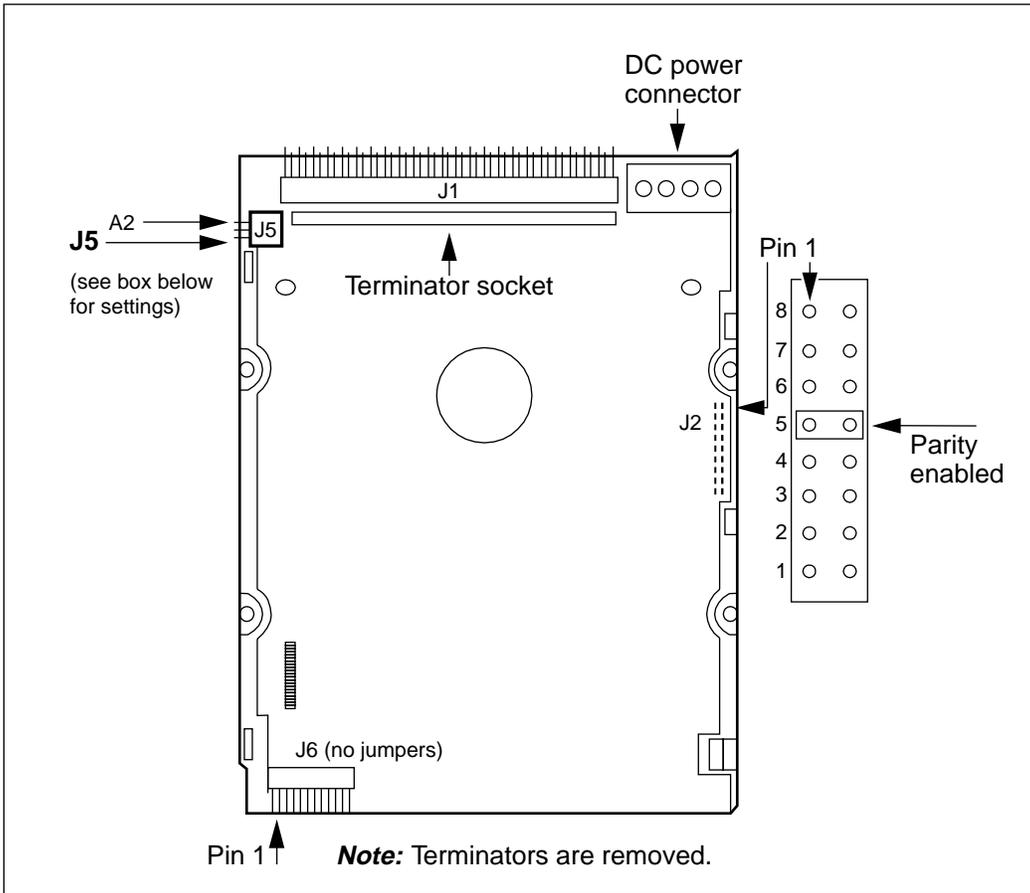


Figure 5-9
1.0-Gbyte Maxtor MXT1240 disk drive connectors and jumper settings

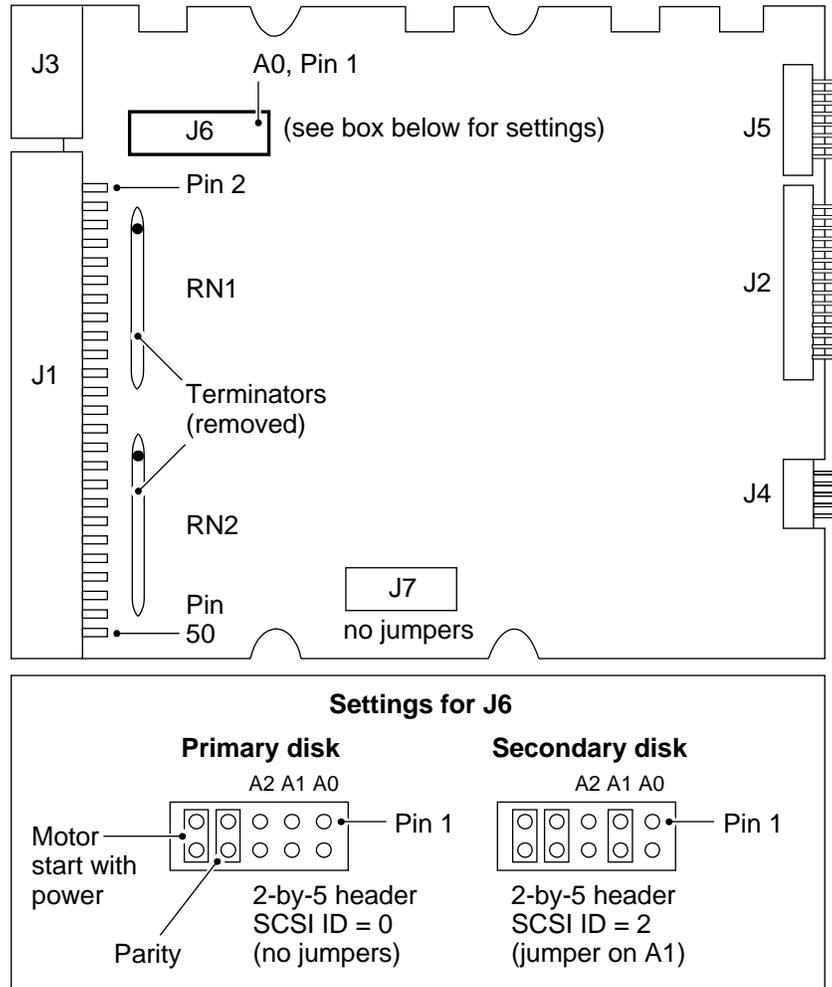


Figure 5-10
1.0-Gbyte DSP3107L disk drive connectors and jumper settings

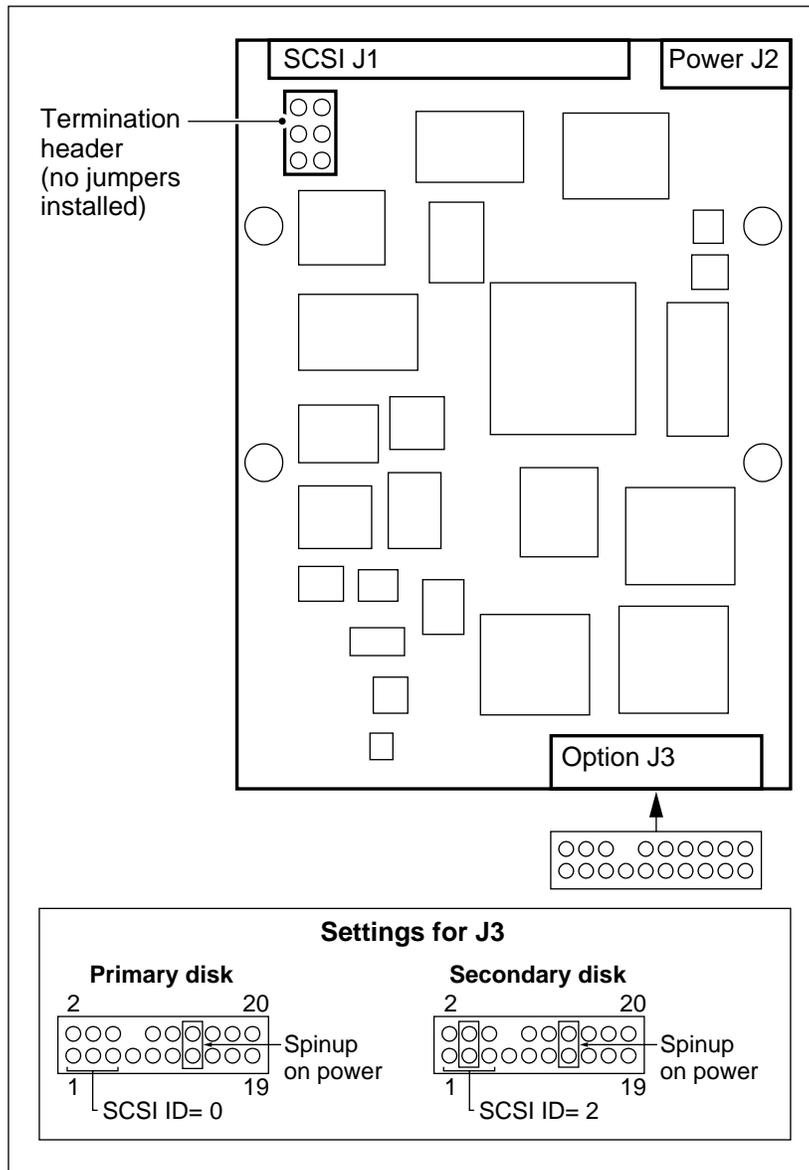


Figure 5-11
600-Mbyte Maxtor/Sequel XT8760SH disk drive connectors and jumper settings

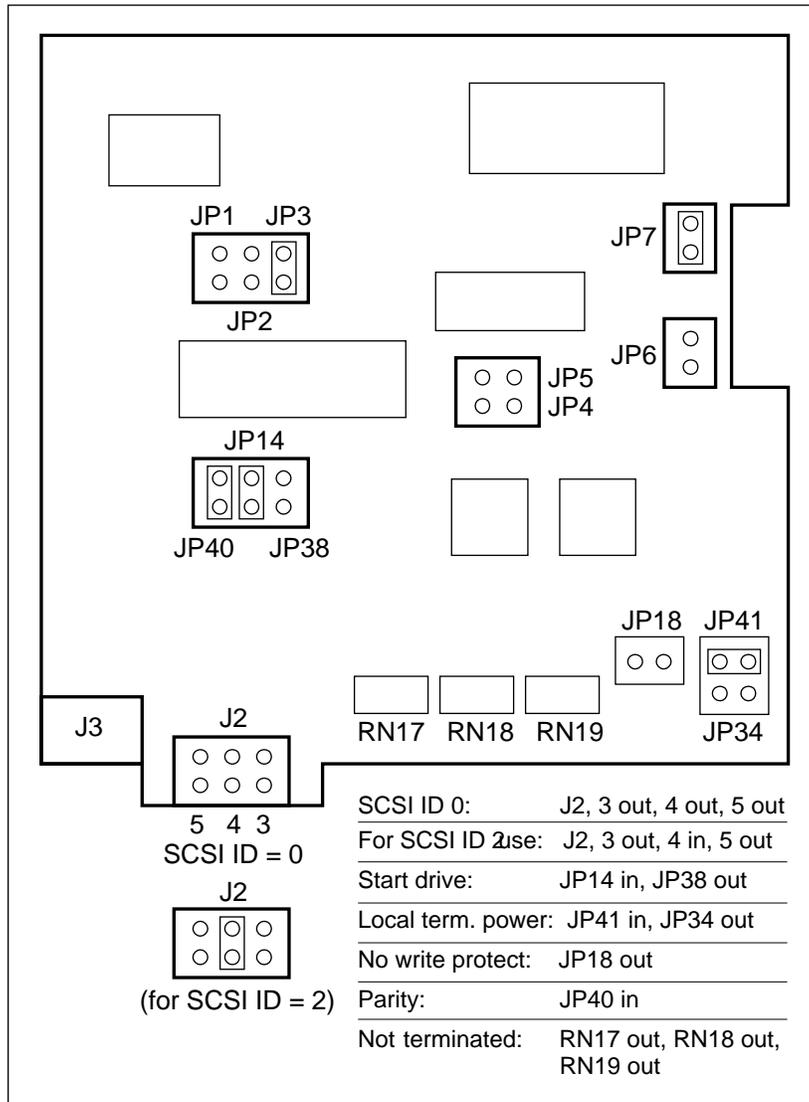


Figure 5-12
Seagate Hawk 2LP disk drive (ST31230N & ST32430N) connectors and jumper settings

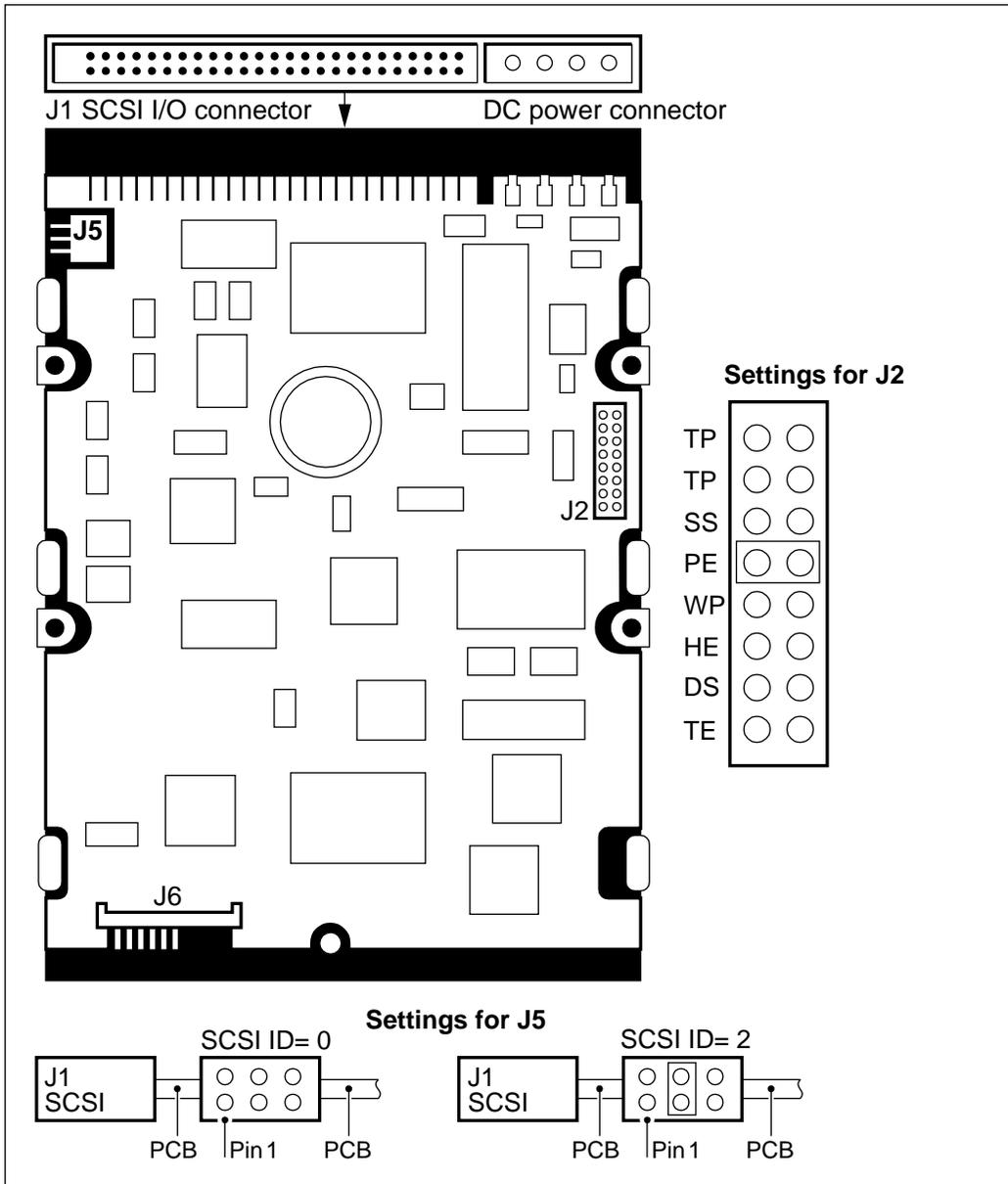


Figure 5-13
300-Mbyte Seagate ST4376N disk drive connectors and jumper settings

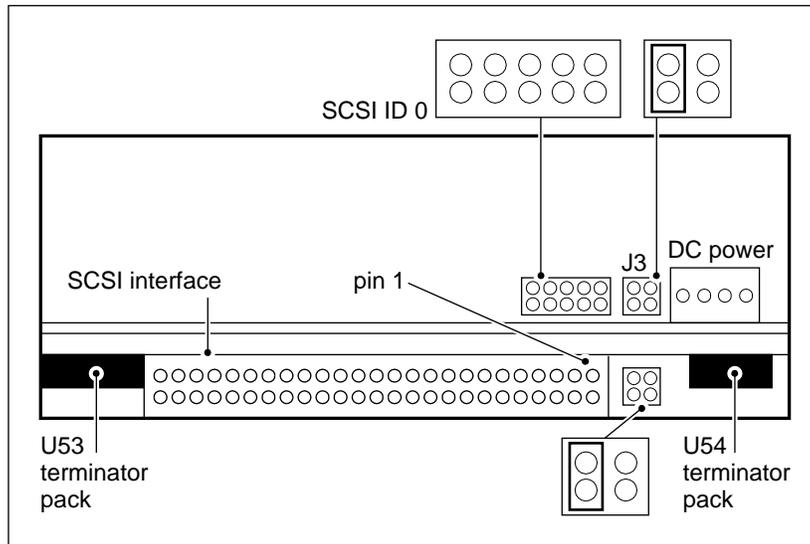
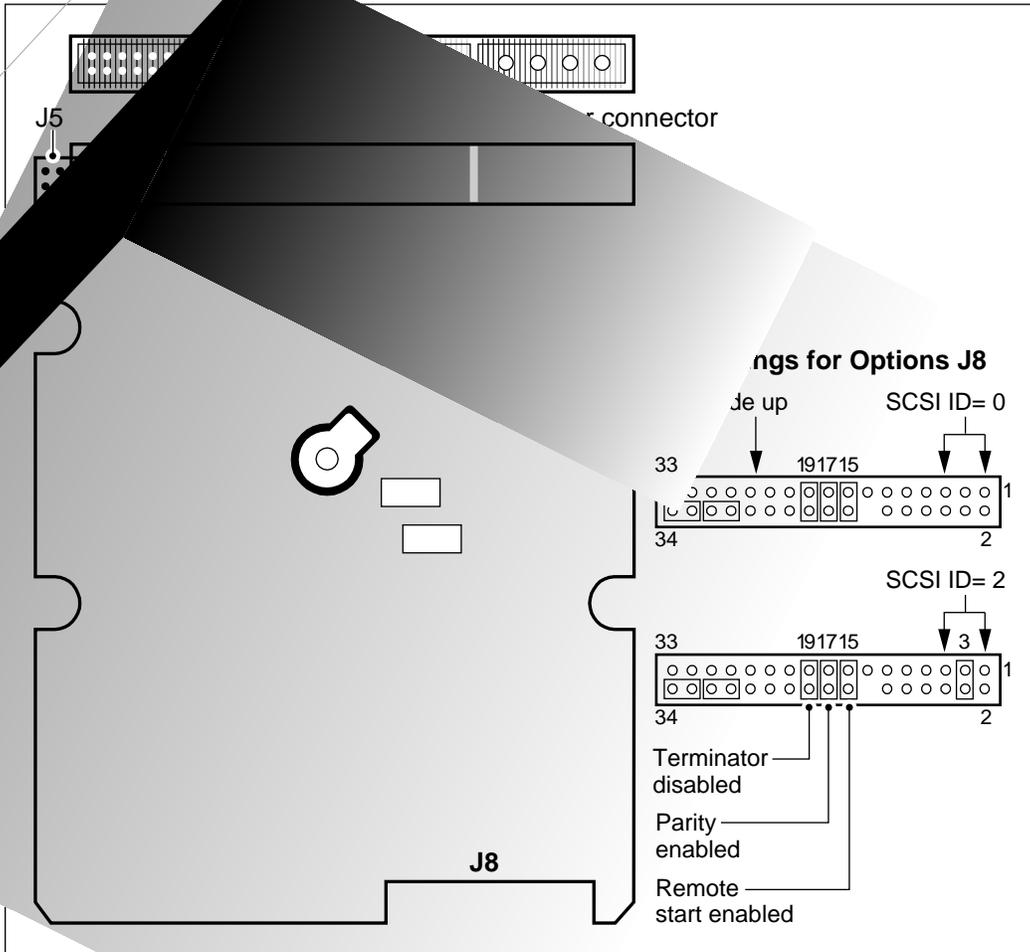


Figure 5-14
545-Mbyte SCSI-660 disk drive



Note: All jumpers are removed.

Overview of tape drives

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

Northern Telecom will ship the customer the appropriate backup tape with the tape drive assembly. The following table lists some of the backup tapes:

Table 5-4
Backup tapes

CPC code	Description
A0369779	DC6150 backup tape
A0368760	DC6250 backup tape
A0630697	2.5-Gb Magnus backup tape



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.

The procedures in this section describe the following:

- how to remove the mass storage unit (MSU) from the Meridian Mail Options system
- how to install the mass storage unit (MSU) into the Meridian Mail Options system. This procedure involves the following:
 - setting the SCSI ID on the tape drive
 - the actual installation of the tape drive

Removal of mass storage unit

Procedure 5-4 Removing the mass storage unit

- 1 Power off the prime node.
- 2 Remove the tape or disk/tape unit by opening the ejectors and then carefully sliding the unit out.

- 3 Look on the replacement unit for the tape drive jumper settings, and ensure that they are configured as shown in Figures 5-15, 5-16, 5-17 and 5-18.
- 4 If the node is shadowed, see Procedure 15-4, "Primary (left side) disk replacement."
- 5 Install the new unit in the same MSU slot as the unit you are replacing by carefully sliding the unit in and locking the ejectors in place.
- 6 Reboot the system.

Installation of mass storage unit

Procedure 5-5

Setting the SCSI ID for the tape drive

- 1 Locate the header beside the SCSI connector.

Archive-this is the 3-by-6 header (see Figures 5-15 and 5-16).

Tandberg-this is the 2-by-10 (see Figures 5-17 and 5-18 for the header location).

- 2 Set the SCSI ID to 1.

Archive-this involves removing any jumpers on the header in positions ID1 and ID2 and inserting a jumper on the header in position ID0 as shown in the figures (5-15 and 5-16).

Tandberg-this involves inserting jumpers on the header in position 0 and Parity as shown in the figures (5-17 and 5-18).

Terminating resistors must be installed in the Meridian Mail module prime node.

Note: Refer to the figures and ensure that all other settings (for example, parity) have been correctly set.

- 3 Ensure that the tape drive terminator resistor packs are removed as indicated in the figures.
- 4 Verify the other jumpers as shown (see Figures 5-15, 5-16, 5-17 and 5-18).

Procedure 5-6

Installing a mass storage unit

- 1 Check the jumper settings are correct as per Figures 5-15, 5-16, 5-17 and 5-18.
- 2 Make sure no SCSI bus terminator is mounted on the tape drive. (See Figure 5-15, 5-16, 5-17 and 5-18.)
- 3 Slowly insert the MSU.

5-20 Inspecting and installing the power supplies and mass storage units

- 4 At the rear side, connect the SCSI interface cable with the red stripe in pin #1, and connect the harness cable into the power connector (12 V, 5 V, and ground) of the tape.

Note: 1 There are two power harness cables. One is extra. Secure it for safety.

Note: 2 A longer SCSI cable is included because the connector on the Viper drive requires the longer SCSI cable in order to complete the installation. As the shorter version of the SCSI cable is shipped only for a brief period of time, you may not need to replace this.

- 5 Make sure the MSU is mounted securely. Tighten mounting and screws.
- 6 Insert power converter pack (QPC585).

Note: DC6150 and DC6250 tapes are recommended for backup. Keeping one type helps to reduce tape drive wear.

Figure 5-15
Archive tape drive

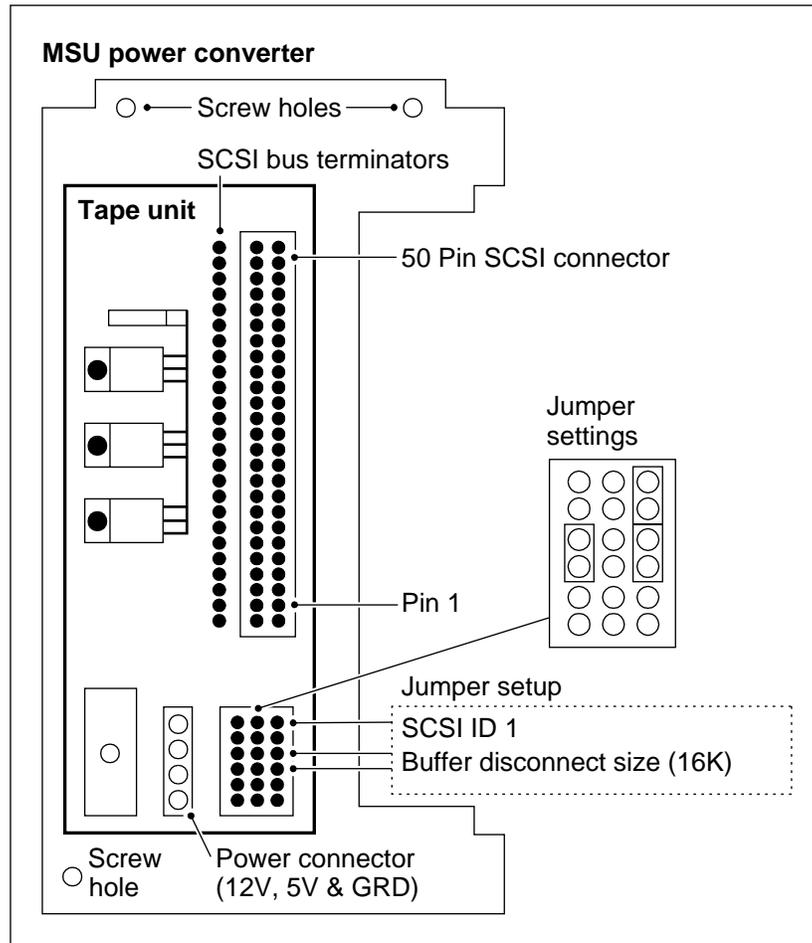


Figure 5-16
Archive tape drive jumper settings

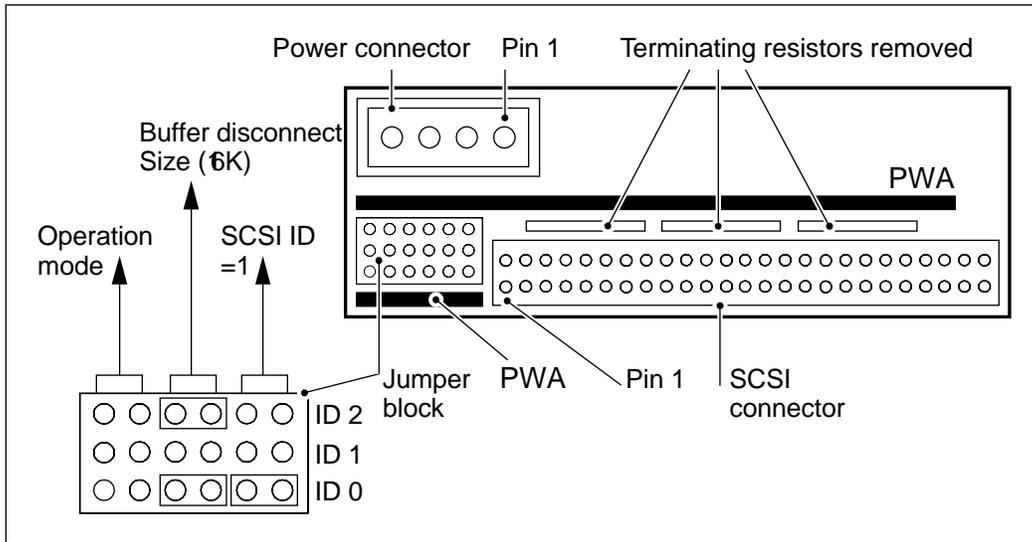
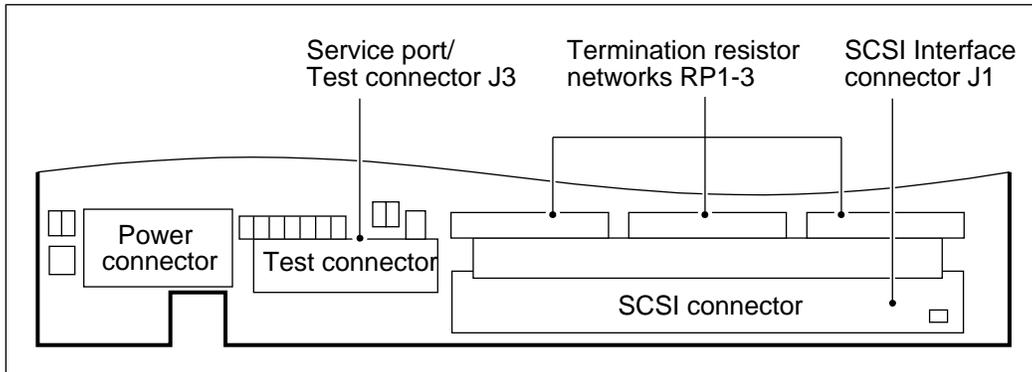
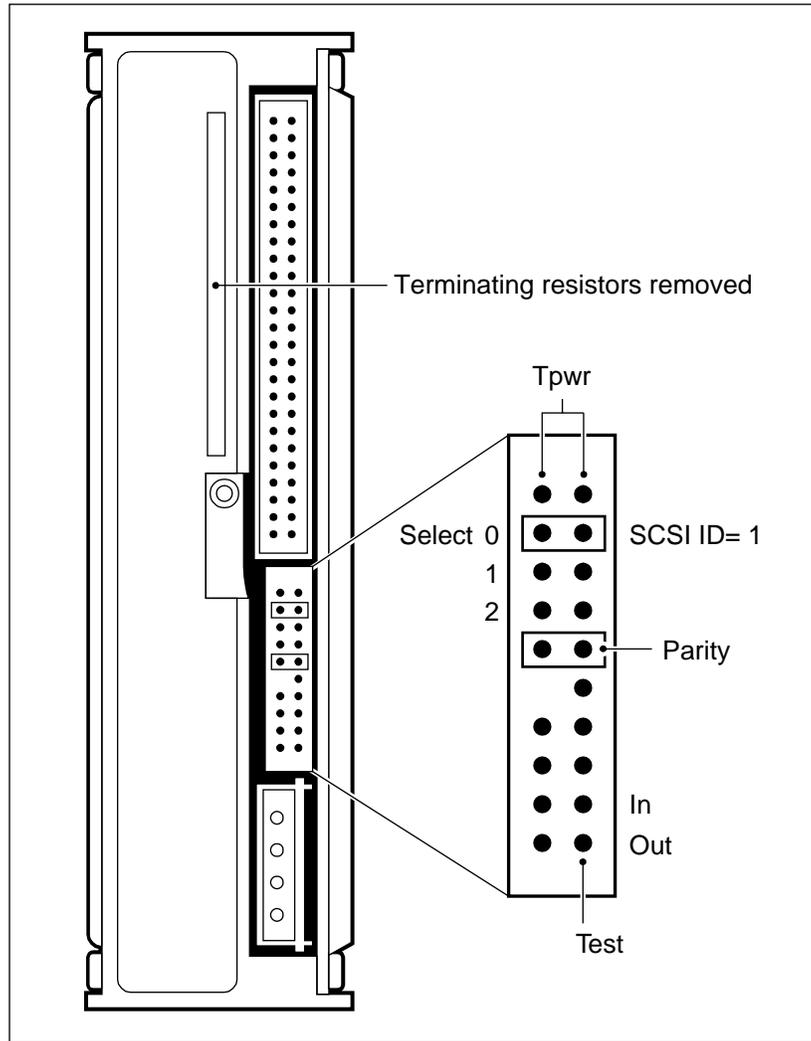


Figure 5-17
Front view of Tandberg tape drive connectors



Note: Terminator resistors are removed.

Figure 5-18
Tandberg tape drive connectors and jumper settings



5-24 Inspecting and installing the power supplies and mass storage units

Chapter 6: Converting to Meridian Mail Release 10.0

If you are converting 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, release conversion, and hardware modification. When necessary, the *System Installation and Modification Guide* refers 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 7. Then refer to the *System Installation and Modification Guide* to begin the conversion to Release 10.0.

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

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. If you choose to operate your system at 9600 bps, affix a sticker to indicate the CPU card is configured for 9600 bps operation.

Converting to Release 10.0

Table 6-1 shows the equipment that needs to be replaced when installing an MMP40 node.

Table 6-1
Equipment to be replaced when converting from ESBC to MMP40 node

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



ATTENTION

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

You must also replace the null modem cable (NTND82AA/AB) between the MMP40 and the A/B switch box with a straight RS-232 cable (NTND91AA/AB). Refer to Figure 10-1 for proper cable configurations.

The ESBC configuration *will not* support Meridian Mail 9.0 or later. To upgrade from Meridian Mail release 8.0 or earlier, you must perform the MMP40 hardware upgrade.

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 6-2 for an overview of the hardware requirements for each conversion scenario.

Table 6-2
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 6-1.
	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 6-2.
Tape drive	Archive Viper	Archive Viper	No change
	Archive Viper	Tandberg TDC4220	Install Tandberg tape drive. See Chapter 15.

All MMP40 cards are shipped from the factory with a default baud setting of 2400 bps. If you decide to use the 9600 baud rate for your system, you will also have to install new high-speed modems. 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 or Modular Option GP 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 successfully 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. If you choose to operate your system at 9600 bps, affix a sticker to indicate the CPU card is configured for 9600 bps operation. See the *System Installation and Modification Guide* (NTP 555-7001-215) for details.

Note: 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.

	<p>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.</p>
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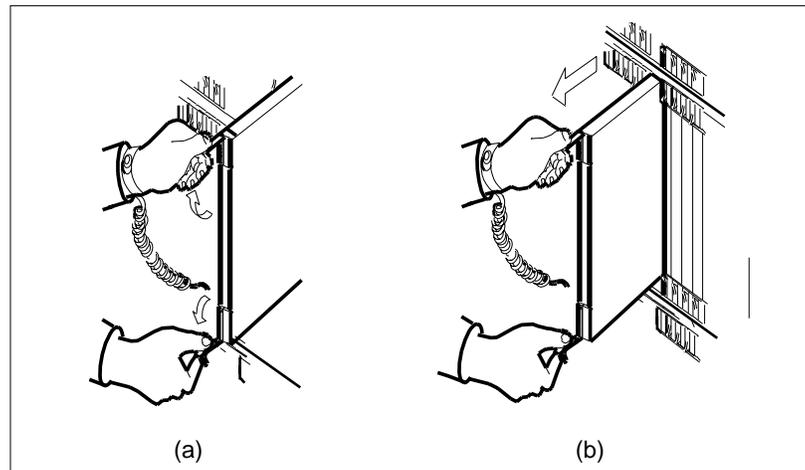
Procedure 6-1
Replacing the 68K card

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 3.
- 2 Refer to the *System Installation and Modification Guide* (NTP 555-7001-215, Chapter 4, "Conversion"), 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 6-1). Store the 68K card in a safe place. You will need this card if you need to reinstall the old system.

- 5 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.
- 6 Seat and lock the card by doing the following:
 - 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.
- 7 Install the supplied designation strips (A0803253) on the Meridian Mail shelves.
- 8 If the terminal baud rate is to be changed to 9600 bps, continue with Procedure 6-2. If the terminal baud rate is to remain at 2400 bps, continue with step 9.
- 9 Return to the *System Installation and Modification Guide* to continue the system conversion. You have now finished all the necessary hardware changes.

Figure 6-1
Printed circuit pack removal



Procedure 6-2
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 for Remote Access" in this manual to ensure the modem is supported for 9600 bps.
- 2 Install the external modems as outlined in Chapter 10 of this manual, "Installing and configuring peripheral devices."
- 3 Return to the *System Installation and Modification Guide* to continue the system conversion.

You have now finished all the necessary hardware changes.

Chapter 7: Inspecting and installing PCPs and cables

Printed circuit packs

The following printed circuit packs (PCPs) are used in Meridian Mail with MMP40 installed. See Table 7-1 and Figure 7-1 for slot locations.

Table 7-1
Meridian Mail PCPs

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

Inspecting printed circuit packs

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

In any case, you need to remove the voice processor packs since TNs are not set at the factory.

Changes to PCPs during node expansion

When you are expanding a system by adding one or more nodes, PCPs may need to be moved from one node to another, and switch or jumper settings may need to be changed. Table 7-2 summarizes the changes that need to be made.

Table 7-2
Summary of changes to PCPs for node expansion

Original # of nodes	New # of nodes	Pack	Changes
1	2	NVP	If 3 NVPs present in node 1, move 1 NVP to node 2. Reset switches on NVP being moved.
		MMP40	Attach terminator to MMP40 in node 2.
		HABC	Attach HABC terminator. Install pack in HABC slot, node 1.
2	4 or 5	NVP	Remove all NVPs from node 1. Reset switches on NVPs being moved.
any	any	MMP40	If original # of nodes is not 1, remove terminator from MMP40 in original last node. Attach terminator to MMP40 in last node.

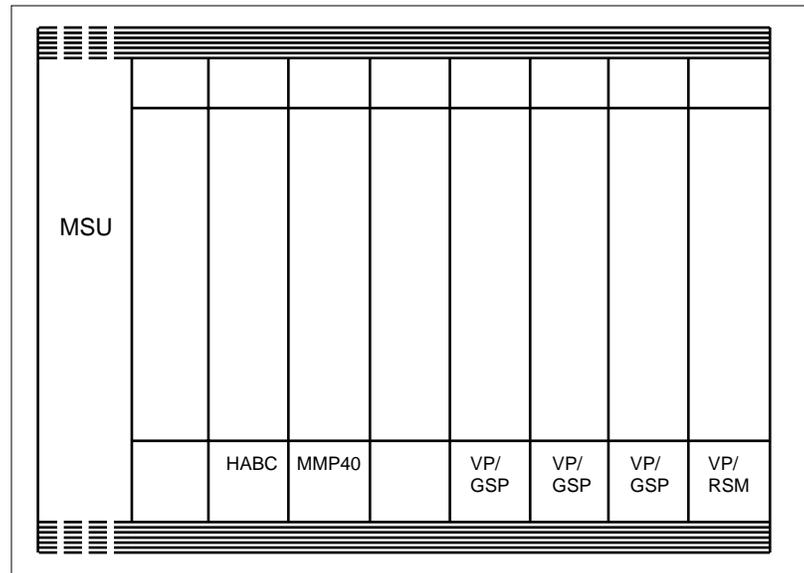
	<p>CAUTION Risk of equipment damage Wear a wrist strap connected to the grounding point while handling PCPs. This precaution protects the packs against damage caused by static electricity.</p>
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Procedure 7-1
Inspecting PCPs

- 1 Locate the PCP slot area in the Meridian Mail module to the right of the MSU slots. Refer to Figure 7-1.
- 2 Remove the faceplate covering the PCPs.
You can now see the designation strip at the bottom of the module. This strip identifies the locations of each pack. The VP/RSM slot and some VP/GSP slots may be empty depending on system size.

- 3 Place the MMP40 sticker over the designation strip on Node 1 with the MMP40 label under the ESBC slot.
- 4 Remove the cable connectors from the fronts of the packs.

Figure 7-1
Card slot locations



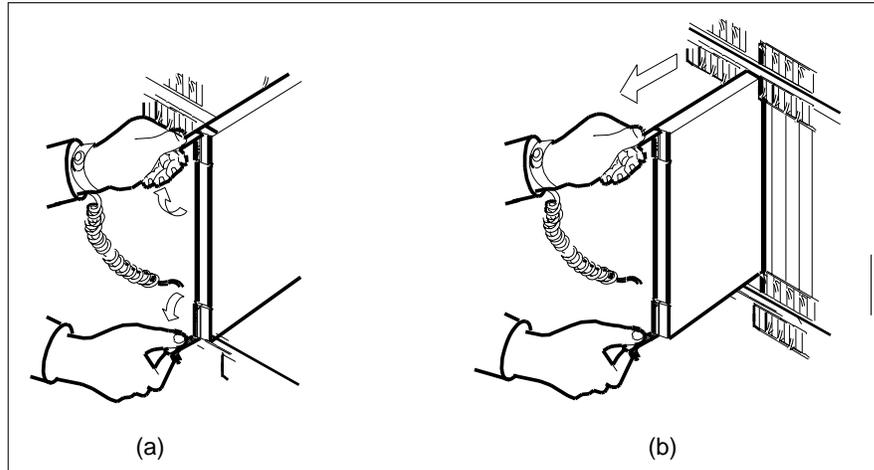
- 5 Open the locking levers on each pack and gently pull the pack towards you until it clears the shelf. (See Figure 7-2).

ATTENTION

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

Although the voice processor cards in the VP/GSP slots and in the VP/RSM slot appear to be identical, they have different switch settings from each other. It is strongly recommended that each be returned to its own slot.

Figure 7-2
PCP removal



- 6 Check the pack to make sure it is not bent and there are no loose parts.
- 7 If you are not placing the pack back in the shelf immediately, put it in an electrostatic discharge (ESD) protective container labeled with the number of the node it came from and the card type from the designation strip.
 - a. Label each pack from a VP/GSP slot with a number from 1 to 3. Number the packs starting with 1 for the leftmost pack in the VP/GSP slots.
- 8 Table 7-3 lists figures that show the locations of switches and jumpers on each pack, and the tables that show the settings for each switch and jumper.

Note: Set the switches on each NVP pack to match the TNs selected for that pack.
- 9 Replace the pack in the shelf by aligning it with the slots in the shelf (the locking levers are still open) and gently sliding the pack back into the shelf.

The designation strip at the bottom of the module identifies the locations of each pack. Refer to Figure 7-1.

Table 7-3
PCP switch locations and settings

Printed Circuit Pack	Switch Locations	Switch Settings
HABC	Figure 7-3	Table 7-4
MMP40	Figure 7-4	Table 7-5
NVP	Figure 7-6	Tables 7-8 to 7-14
RSM	Figure 7-5	Table 7-6

- 10 Seat and lock the pack.
 - a. Push on the upper and lower front edges of the pack to ensure that it is fully seated in the shelf. It is particularly important to seat packs firmly with only one locking lever (for example, the MMP40).
 - b. Close the locking levers.

High availability bus controller

The high availability bus controller (HABC) pack is used in the HABC slot of the first node of a multi-node system. See Figure 7-3 for switch locations and Table 7-4 for the settings.

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

Figure 7-3
HABC switch locations

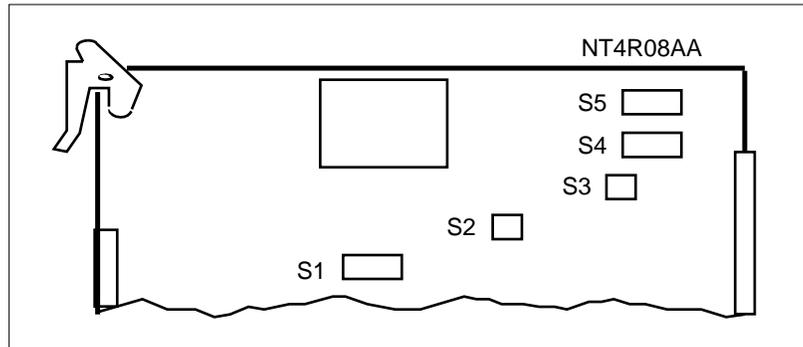


Table 7-4
HABC switch settings

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

Meridian Mail Processor 68040

The Meridian Mail Processor 68040 (MMP40) contains an MC68040 microprocessor, 16 Mbytes of memory, a SCSI interface, two programmable serial ports, and a BootROM that includes system diagnostics.

Figure 7-4 shows the locations of the switches whose settings are listed in Table 7-5.

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

Figure 7-4
MMP40 switch location

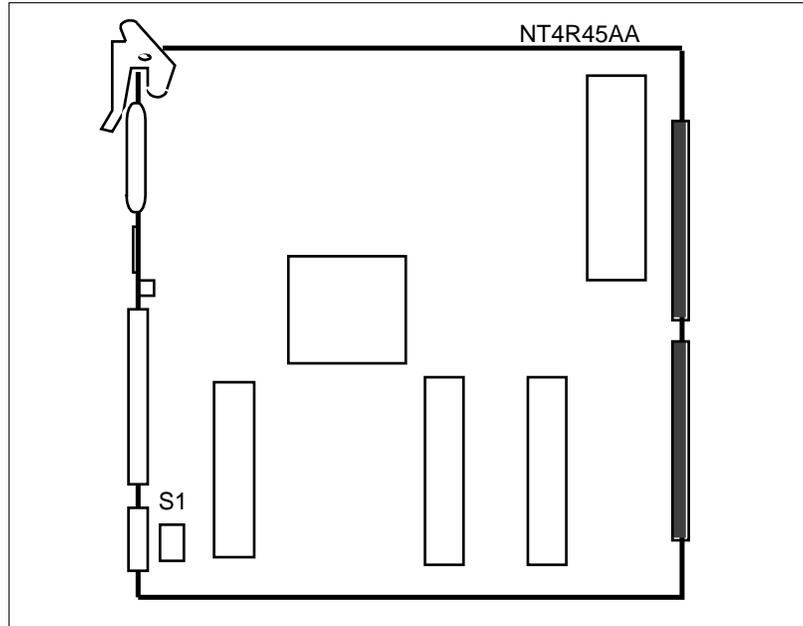


Table 7-5
MMP40 switch settings

Switch settings		1	2	3	4	5	6	7	8
S1	Single node system:								
	Node 1	On	On	On	On	On	On	On	On
	Multiple node system:								
	Node 1	On	On	Off	On	On	On	On	On
	Node 2	Off	Off	Off	On	On	On	On	On
	Node 3	On	Off	Off	On	Off	On	On	On
	Node 4	Off	Off	Off	On	Off	On	On	On
Node 5	On	Off	Off	On	On	Off	On	On	

RS-232 service module

The RS-232 service module (RSM) pack provides four RS-232 ports as well as a battery-backed clock. The NT4R03AB version of the pack also includes a bypass switch which allows you to operate the system in "bypass" mode during recovery from such problems as hardware and link failures. Unless otherwise instructed by Nortel support, leave the card set to "normal" mode (the switch down). The LED is on when the card is in normal mode. See Figure 7-5 for switch locations and Table 7-6 for the settings.

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

Figure 7-5
RSM switch locations

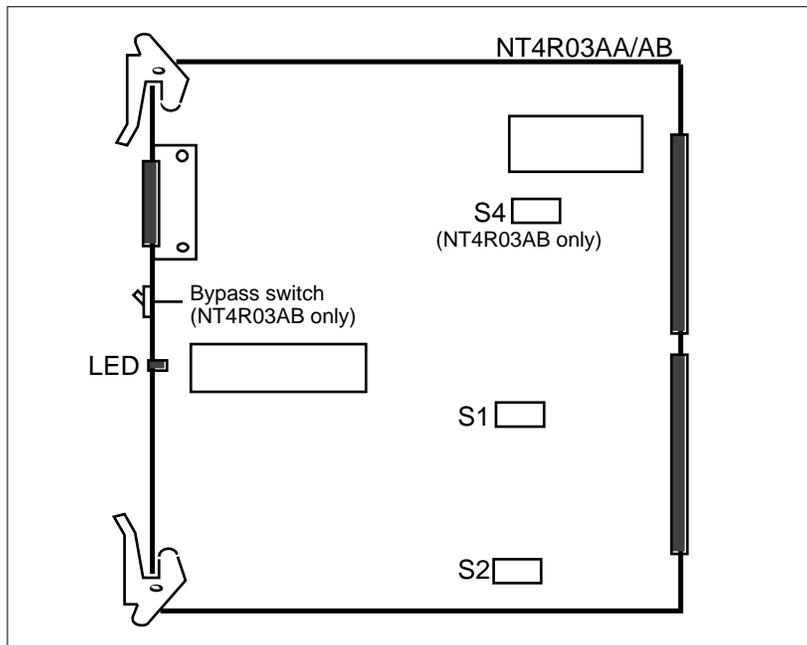


Table 7-6
RSM switch settings

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

Network voice processor

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

Each Meridian Mail node except for node 1 can have a maximum of four NVP cards. The maximum number of NVPs in node 1 depends on the number of nodes in the system. See Table 7-7.

Table 7-7
Number of NVPs in node 1

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

The following figures and tables are provided to help you set the switches on the NVP cards:

- Figure 7-6 shows the locations of the switches.
- Table 7-8 shows the required switch settings for switches S1 to S4.
- Tables 7-9 to 7-14 show the switch settings for switch S5.

7-10 Inspecting and installing PCPs and cables

- Table 7-15 provides an example for setting switch S5.
- Table 7-16 is a blank form that you can use to determine the switch settings for S5.

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

Figure 7-6
NVP switch locations

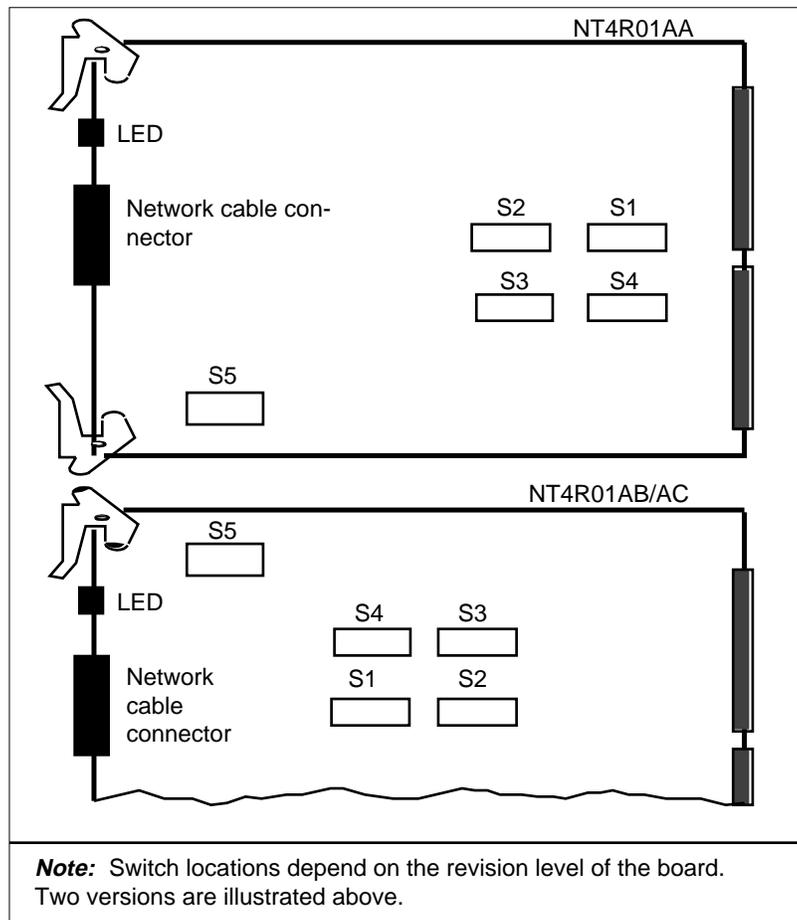


Table 7-8
NVP switch settings (switches 1 to 4)

Switch	NVP 1	NVP 2	NVP 3	NVP 4
S1-1	On	On	On	On
S1-2	On	On	On	On
S1-3	On	On	On	On
S1-4	Off	Off	Off	Off
S2-1	On	On	On	On
S2-2	On	On	On	On
S2-3	On	On	On	On
S2-4	On	On	On	On
S2-5	On	On	On	On
S2-6	On	On	On	Off
S2-7	On	Off	Off	On
S2-8	Off	On	Off	On
S3-1	On	On	On	On
S3-2	Off	Off	Off	Off
S3-3	Off	Off	Off	Off
S3-4	On	On	On	On
S3-5	Off	Off	On	On
S3-6	Off	On	Off	On
S4-1	Off	Off	Off	Off
S4-2	Off	Off	Off	On
S4-3	Off	On	On	Off
S4-4	On	Off	On	Off
S4-5	Off	Off	Off	Off
On = Closed Off = Open See below for setting of switch 5				

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

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

Once you have determined the card slot number used in the TNs for the ACD agents that correspond to this NVP card, refer to Table 7-9 for the switch settings for S5-1 to S5-4. Each NVP card can support up to four voice channels; therefore, the first four ACD agents are associated with the first NVP card in the first Meridian Mail voice node. The second four ACD agents are associated with the next NVP card, and so on.

Table 7-9
NVP switch settings for card number (switches 5-1 through 5-4)

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

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

The shelf number, unit number, and card density programmed for the ACD agent TNs determines the switch settings for S5-5 and S5-6, as shown in Table 7-10. The card density can be single density or double density. The shelf number is the second number in the ACD agent TN, and the unit number is the last number in the ACD agent TN. For example, if the TNs for the first four ACD agents are 28 0 3 0, 28 0 3 1, 28 0 3 2, and 28 0 3 3, and the switch shelf is programmed for single density, then the switch settings for S5-5 and S5-6 on the first NVP card must be set to "On On".

**Table 7-10
NVP switch settings for shelf and unit (switches 5-5 and 5-6)**

Single density configuration			
Shelf	Unit	S5-5	S5-6
0	0-3	On	On
1	0-3	Off	On
2	0-3	On	Off
3	0-3	Off	Off
In the single density configuration, each TN (loop, shelf, card) has four units (from 0 through 3). The NVP card has four voice channels, so each NVP card has its own shelf number.			
Double density configuration			
Shelf #	Unit	S5-5	S5-6
0	0-3	On	On
0	4-7	Off	On
1	0-3	On	Off
1	4-7	Off	Off
In the double density configuration, each TN (loop, shelf, card) has eight units (from 0 through 7). The NVP card has only four voice channels, so two NVP cards can be given the same shelf number but different units.			

Loop back (S5-7)

An NVP can be set to loop-back for testing, using switch 5-7. For normal use, the card is not set for loop-back (see Table 7-11). Set to loop-back only if asked to do so by Nortel support.

Table 7-11
NVP switch settings for loop-back

Switch	Prime	Secondary
S5-7	Off	On

Prime NVP in node (S5-8)

Only one NVP per node can be designated as the prime, for which NVP1 is recommended (the leftmost NVP card in the node). The NVP is set to prime using switch 5-8 (see Table 7-12).

Table 7-12
NVP switch settings for prime NVP in node

Switch	Prime	Secondary
S5-8	Off	On

Setting the Terminal Number, loop-back, and prime NVP - an example

Table 7-13 shows how to set switch 5 for four NVPs in a node, according to the shelf, card and unit programmed for them in the Meridian 1.

Table 7-13
Terminal Number, loop-back, and prime NVP set by NVP switch 5

NVP		Shelf &							
		<--Card-->				Unit	LB	PR	
	switch 5-	1	2	3	4	5	6	7	8
NVP1	Shelf 0, card 6, unit 0-3	1	0	0	1	1	1	1	0
NVP2*	Shelf 0, card 6, unit 4-7	1	0	0	1	0	1	1	1
NVP3*	Shelf 0, card 7, unit 0-3	0	0	0	1	1	1	1	1
NVP4*	Shelf 0, card 7, unit 4-7	0	0	0	1	0	1	1	1
On = closed = 1									
Off = open = 0									
* Where applicable									

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

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

For example, 2 Meridian Mail nodes with 3 NVPs each (24 channels total) can share a single loop if the NT4R01AB or AC versions of the NVP are used.

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

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

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

An example of setting loop sharing and prime NVP

See Table 7-14 for switch 5-8 and 5-9 settings for loop sharing between nodes 2 and 3 with three NVPs each.

**Table 7-14
NVP switch settings for loop sharing**

Node	NVP	Switch 5-8	Switch 5-9
2	NVP1	Off	On
2	NVP2	On	On
2	NVP3	On	On
3	NVP1	Off	Off
3	NVP2	On	On
3	NVP3	On	On

If loop sharing is not in effect, set switch 5-9 Off.

Switch 5-10 Setting (NT4R01AB and NT4R01AC only)

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

Sample and form for setting Switch 5

Table 7-15 contains a form which you may find useful for determining the switch settings for NVP switches 5-1 through 5-10 based on Terminal Number and the location of the NVP. The example is for a 2 node 20-channel system sharing loop 5.

Table 7-15
Determining NVP switch 5 settings (sample data filled in)

Meridian 1 TN				NVP location			Card (Table 7-9)	Shelf/ Unit (Table 7-10)	Mode (Tables 7-11, 7-12, 7-14)							
Loop	Shelf	Card	Unit	Node	NVP	DNs	Switch 5-									
							1	2	3	4	5	6	7	8	9	10
5	0	1	0-3	1	NVP1	7000-7003	0	1	1	1	1	1	1	0	0	0
5	0	1	4-7	1	NVP2	7004-7007	0	1	1	1	0	1	1	1	1	0
5	0	2	0-3	2	NVP1	7008-7011	1	0	1	1	1	1	1	0	1	0
5	0	2	4-7	2	NVP2	7012-7015	1	0	1	1	0	1	1	1	1	0
5	0	3	0-3	2	NVP3	7016-7019	0	0	1	1	1	1	1	1	1	0

Verifying PCP cabling

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

This section provides a complete reference to the cabling involved.

Figure 7-7 shows the I/O panel which is at the left of the rear of each module.

Figures 7-8 to 7-10 illustrate the cables at the circuit packs, and Table 7-17 describes how they are routed.

Figure 7-7
Meridian Mail I/O panel

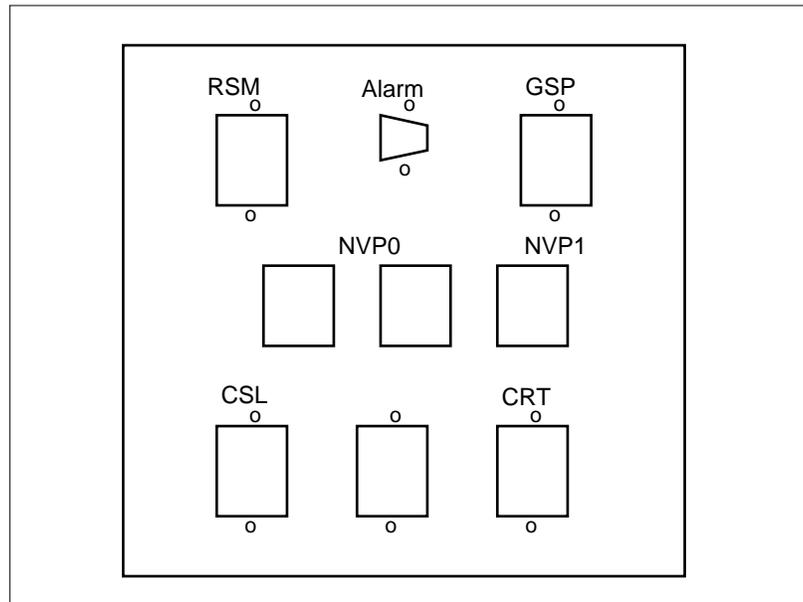


Figure 7-8
PCP cables for a single-node system

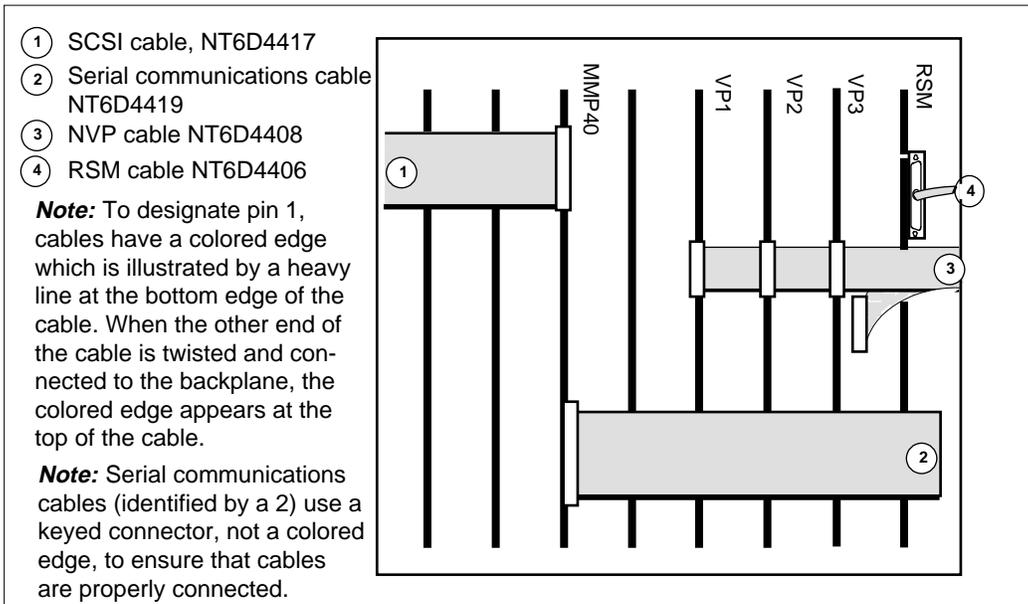


Figure 7-9
PCP cables for a 2-node system

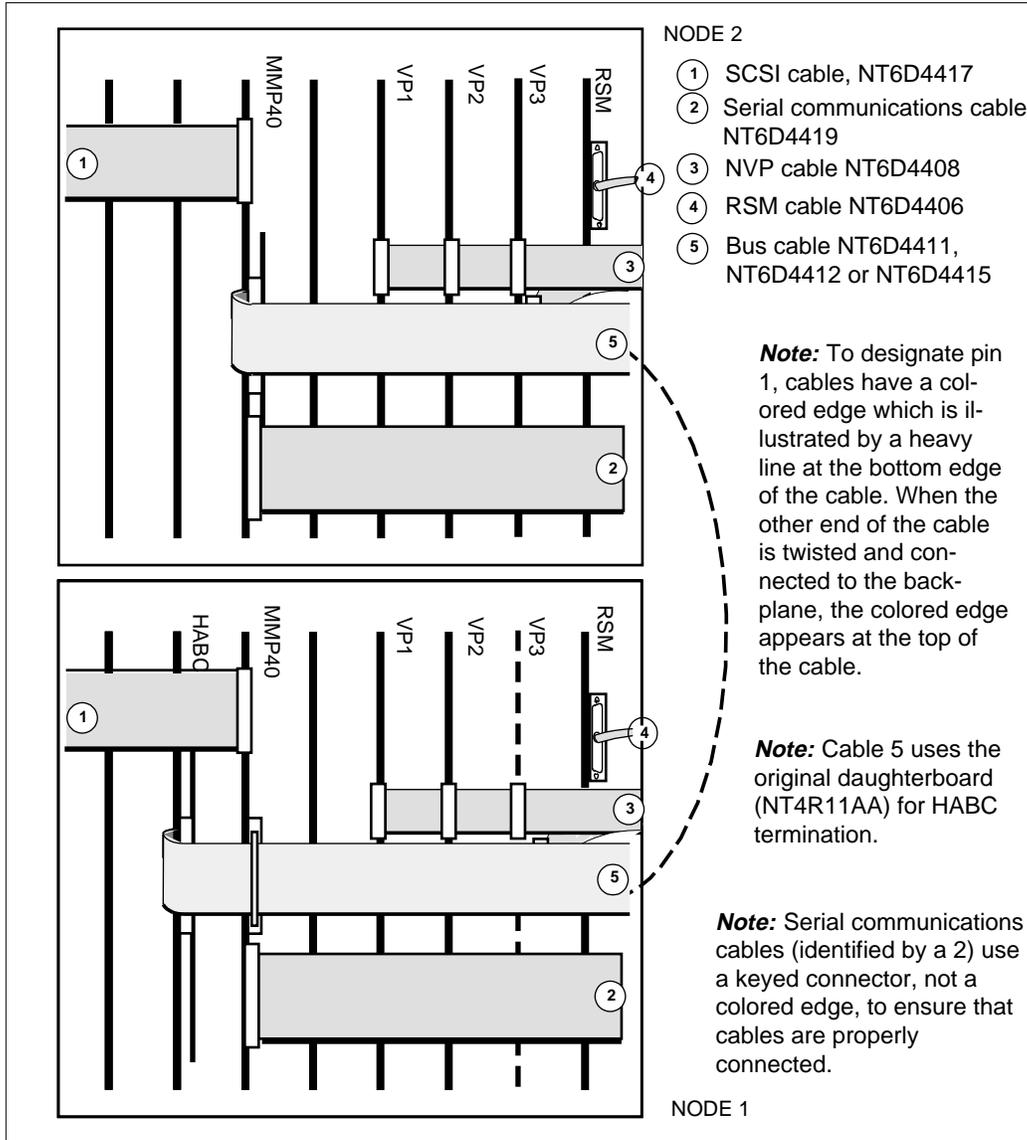
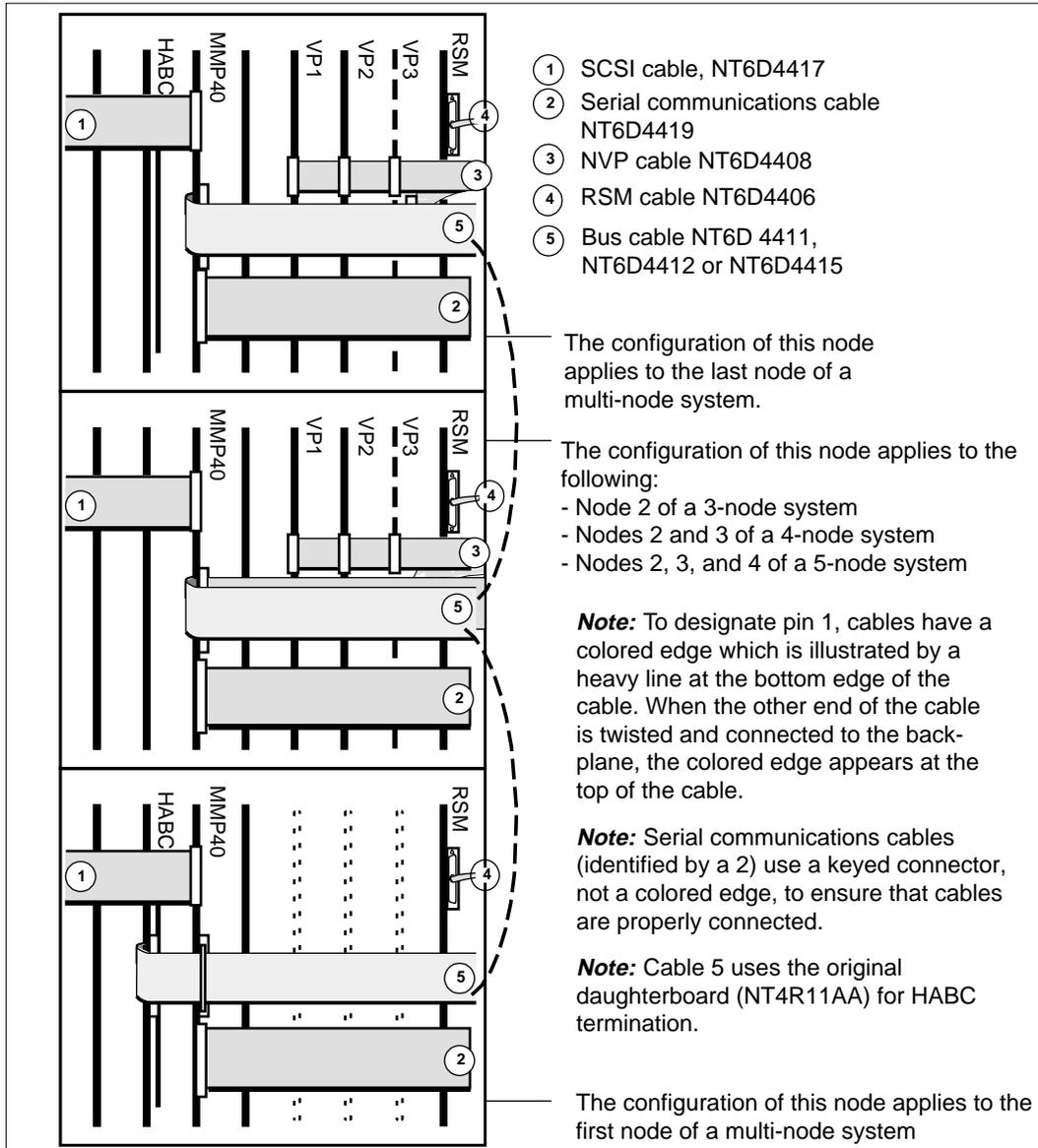


Figure 7-10
PCP cables for a multi-node system



7-22 Inspecting and installing PCPs and cables

Table 7-17
Cable routing (Reference-Figures 7-8 to 7-10)

	NT code	Cable	Routing information
cable1	NT6D4417 (A0618621)	SCSI	From front of MMP40 card to rear of shelf, between the MMP40 card and the metal plate (a clip is provided to hold the cable in place). Attach to 50-pin connector on the front side of the backplane. Note: Caution is required when folding and positioning the new SCSI cable. The cable has to be twisted to ensure proper lineup of the pins. Also, ensure the cable is properly folded and positioned away from the edges, as it may become pinched when replacing the metal cover.
cable 2*	NT6D4419 (A0618623)	Serial communications cable	From the bottom connector at the front of MMP40 card to rear of shelf, between the RSM card and the metal plate (a clip is provided to hold the cable in place). Route to CSL and CRT connectors on the Meridian Mail I/O panel.
cable 3	NT6D4408 (A0363747)	NVP	From front of NVP cards to rear of shelf, between the RSM card and the metal plate (a clip is provided to hold the cable in place). Route to the Meridian Mail connector panel-the end connector to NVP1 and the other connector to NVP0.
cable 4	NT6D4406 (A0363813)	RSM	From front of RSM card to rear of shelf, between the RSM card and the metal plate (a clip is provided to hold the cable in place). Route to the RSM port on the Meridian Mail connector panel.
cable 5	NT6D441 <i>n</i> where <i>n</i> is 1, 2 or 5 (A0367987) (A0368070) (A0364039)	Bus	Systems with two or more nodes only-from HABC terminator on node 1 HABC to the middle connector at the front of the MMP40 card on node 1. Route between RSM card and the metal plate, and through an opening on the plate. Route cable up to the next module, and through a plate opening on node 2. (2-node system) Connect to MMP40 terminator, node 2. (Multi-node system) Connect to the middle connector at the front of the MMP40 card on node 2 and route (as from node 1 to node 2) to the next node. Continue to each MMP40 card until the MMP40 terminator is reached on final node. Daisy-chain cables as needed.
* The combined AML/CRT cables each have a brown wire on the inside edge that is intentionally not used.			

Chapter 8: Diagnostics

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

Note that, depending on the changes made to the system, this procedure may not test the functionality. For example, if a new node has been added to the system, its ability to communicate with the prime node cannot be tested until the software expansion feature is attempted. This procedure will test features such as the functionality of the MMP40 card, the ability of the high availability bus controller (HABC) (for multi-node systems) to provide bus clocks, and power supplies.

Procedure 8-1 Sanity testing

Perform diagnostics on each module as follows:

- 1 With the console terminal connected to node 1, turn the power on at node 1, and observe the output on the terminal and on the MMP40 hexadecimal display.
The hexadecimal display should follow the normal bootup sequence described in Chapter 13. If it does not, follow the troubleshooting procedures in the "System fails to boot completely" section in Chapter 13.
- 2 For multi-node systems, observe the HABC message displayed early in stage 1 of table 13-2. This message should indicate that an HABC has been detected.
- 3 Turn the power off at node 1, and check the results of the diagnostics. If diagnostics failed, refer to Chapter 13.
- 4 For single node systems, testing is complete. For multi-node systems, continue with step 5.

Multi-node systems only:

- 5 Power up the system and observe the hexadecimal display on the MMP40 cards in the non-prime nodes.
The displays should advance to ".6".
- 6 Turn the power off at all nodes.
All testing that can currently be performed is complete. If any node failed the testing, replace the MMP40 card and return to step 5. If the problem is not corrected, refer to the troubleshooting procedures in Chapter 13 to verify the installation.
- 7 Turn to the "Performing hardware modification for Options, Modular Option, and Modular Option EC MMP40, and Modular Option EC 68K platforms" section in the Hardware modification chapter of the *System Installation and Modification Guide* (NTP 555-7001-215).
 - a. Go to the step after installing the new hardware.

Chapter 9: Installing the Meridian Mail to PBX interface

The procedures in this chapter describe how to install the hardware that links Meridian Mail to the PBX. The Meridian 1 programming needed to support the links is discussed in Chapter 11.

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

- one network loop for every 24 or fewer channels (recommended) from Meridian Mail to the Meridian 1
- an AML data link from the Meridian Mail prime node to the Meridian 1

Installing the network loop

Meridian Mail can be used with any dedicated Meridian 1 network loop with Terminal Numbers (TNs) available for Meridian Mail usage. Each Meridian Mail port requires a TN. The Network Voice Processor (NVP) packs on your system accommodate 4 TNs, so that six NVPs use all of the channels available on a network loop.

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

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

9-2 Installing the Meridian Mail to PBX interface

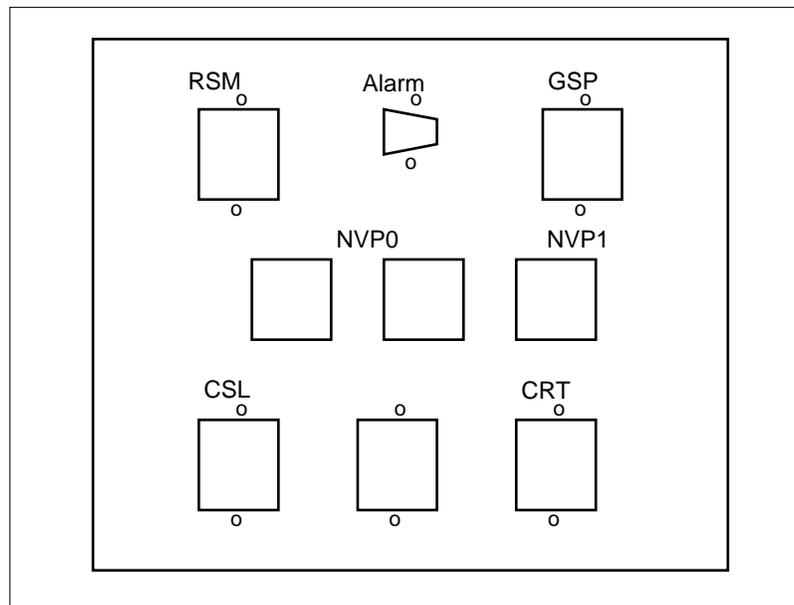
The procedures below explain how to connect one-, two- and multi-node Meridian Mail systems to a Meridian 1 switch.

All connections at the Meridian Mail end are made to the NVP0 and NVP1 connectors of the I/O panel at the rear of the Meridian Mail cabinet. See Figure 9-1.

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

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

Figure 9-1
I/O panel



Network loop cable-with and without loop sharing

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

Procedure 9-1

Installing PBX interface cabling on a one-node system

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

Procedure 9-2

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

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

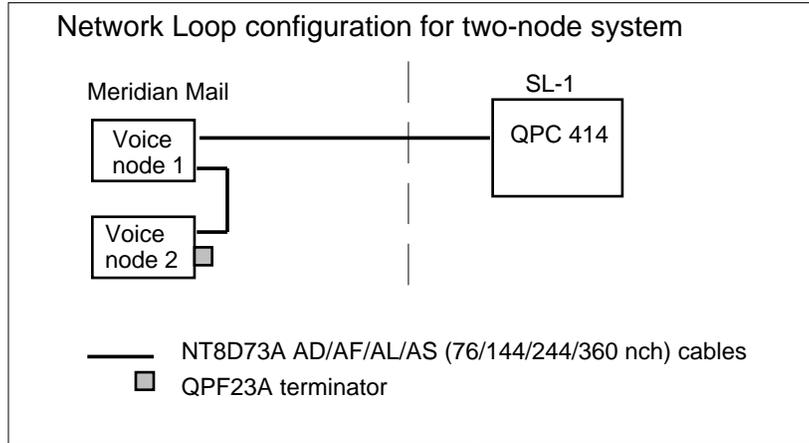
- 1 Cable the first node as described above for a single node, but do not install the terminator on NVP0.
- 2 Attach a second network cable from the NVP0 connector on the first node to the NVP1 connector on the second voice node.
- 3 Install a terminator on the NVP0 connector on the second voice node. See Figure 9-2.

Procedure 9-3

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

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

Figure 9-2
Network loop sharing for two voice nodes

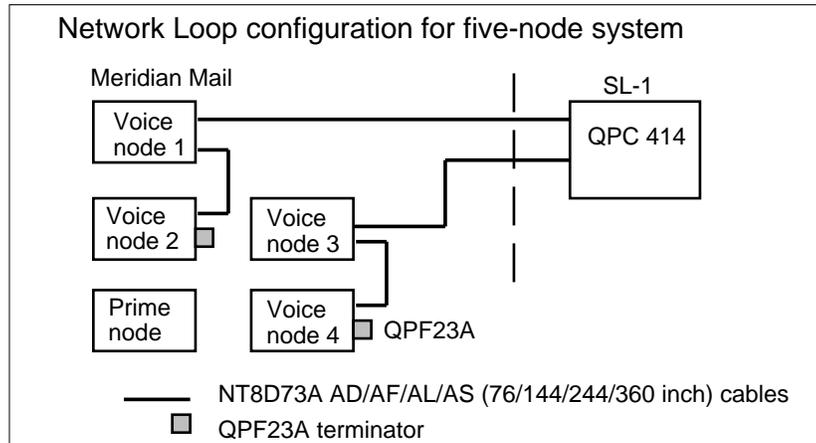


Procedure 9-4
Installing PBX interface cabling on a multi-node system (with loop sharing)

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

- 1 Cable the first pair of voice nodes as described above for two voice nodes with loop sharing.
- 2 Attach a third network cable from the unused (J1 or J2) port of the QPC414 card on the Meridian 1 to the NVP1 port on the third voice node.
- 3 If the system has three voice nodes, install a terminator on the NVP0 port of the third voice node.
- 4 If the system has four voice nodes, install a fourth network cable from the NVP0 connector on the third voice node to the NVP1 connector on the fourth voice node; then, install a terminator on the NVP0 connector on the fourth voice node. See Figure 9-3.

Figure 9-3
Network loop sharing for four voice nodes



Connecting to the Meridian 1 I/O panel

The procedures (described on the previous pages) for connecting one-, two-, and multi-node Meridian Mail systems to a Meridian 1 switch assume that you are going to attach the network loop cable directly to the network card on Meridian 1.

Follow Procedure 9-5 if you want to make the connection through the Meridian 1 I/O panel instead.

Procedure 9-5 **Connecting to the Meridian 1 I/O panel**

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

Installing the AML (ISDN/AP) link

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

Before beginning, make sure you have all the necessary equipment:

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

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

The MSDL card has four ports which share one *device number*. The ESDI has two ports, each of which is assigned a separate device number (range 0-15) in Overlay 17 (see prompt ADAN, Table 11-2). The device number identifies the ESDI port or MSDL card.

Appendix C at the end of this document discusses how to determine the values you need in order to program the Meridian 1 data link. Refer to Appendix C if you are not familiar with how to determine device numbers.

Installing the multi-purpose serial data link

Each multi-purpose serial data link (MSDL) card has four ports on the faceplate of the card. Because all four ports on the card are associated with ONE *device number*, the MSDL occupies only 1 of the 16 allowed devices for Meridian 1 (unlike the ESDI which occupies 2). The device number or "DNUM" which allows the Meridian 1 to recognize it, is programmed in the Meridian 1 Load 17. This is explained in Appendix C, "Meridian 1 configurations."

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

Procedure 9-6 Installing the MSDL card

- 1 Log on to the Meridian 1.
- 2 Load Overlay 22 and print out the Configuration Record (refer to Table 9-1).

Table 9-1
Overlay 22-printing existing Meridian 1 configuration

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

- 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 as you will need them when configuring the ports.
- 4 Unpack and inspect the MSDL card, and check that there are no obviously loose or bent parts.
- 5 For the port you are going to use for the AML, set the switches on the card in accordance with the guidelines in Table 9-2.
- 6 Set the S9 and S10 switches on the MSDL to the assigned device number (DNUM) you chose in step 3 above. For example, if you chose device number 10, set S9 to 1 and S10 to 0.
- 7 Install the card in the slot you chose for it.
- 8 Observe the red LED on the MSDL faceplate.
 The LED should flash three times and then stay on continuously until the card is configured and enabled in the software. If the LED does not behave in this pattern, replace the card.

Figure 9-4
MSDL switch locations and example of switch settings

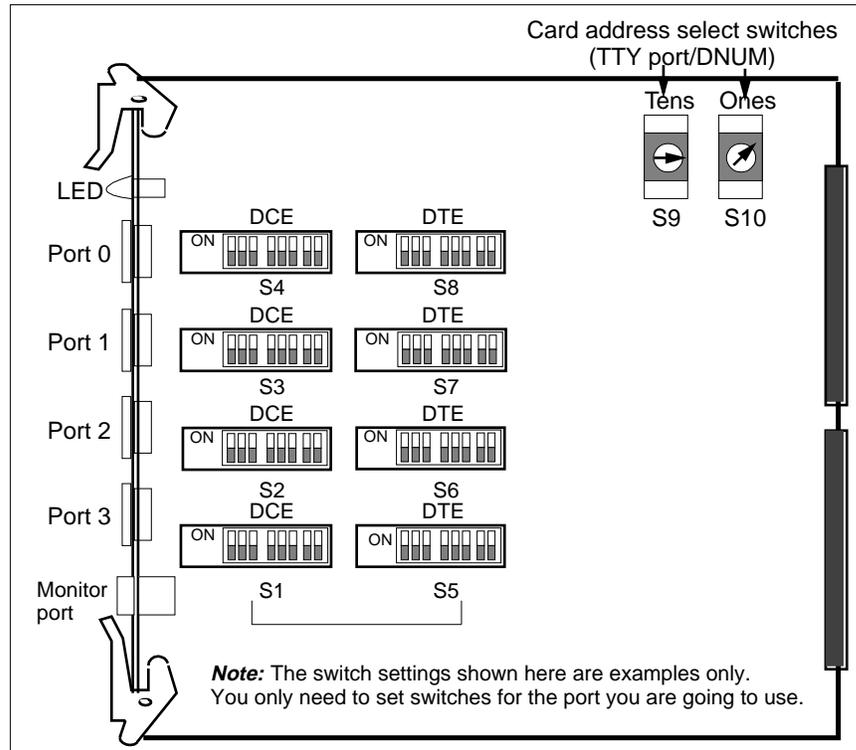


Table 9-2
MSDL card switch settings

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

Installing the Enhanced Serial Data Interface

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

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

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

Note: In the Meridian 1 documentation (*Circuit Card Installation*), this vintage of card is referred to as a "Style B" card.

Procedure 9-7 Installing the ESDI card

- 1 Log on to the Meridian 1.
- 2 Load Overlay 22 and print out the Configuration Record. Refer to Table 9-3.

Table 9-3
Overlay 22-printing existing Meridian 1 configuration

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

- 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 as you will need them when configuring the ports.

9-10 Installing the Meridian Mail to PBX interface

- 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 9-5.
- 7 Set the device address switches on the ESDI card according to Figure 9-6. You will use the DNUM in overlay 17.
- 8 Select a slot in the common equipment module of the Meridian 1, and install the ESDI circuit pack.
Refer to Circuit Card Installation (NTP 553-3001-21 1).
- 9 Set the ESDI faceplate switch to "ENB".

Figure 9-5
ESDI card jumpers and address switch

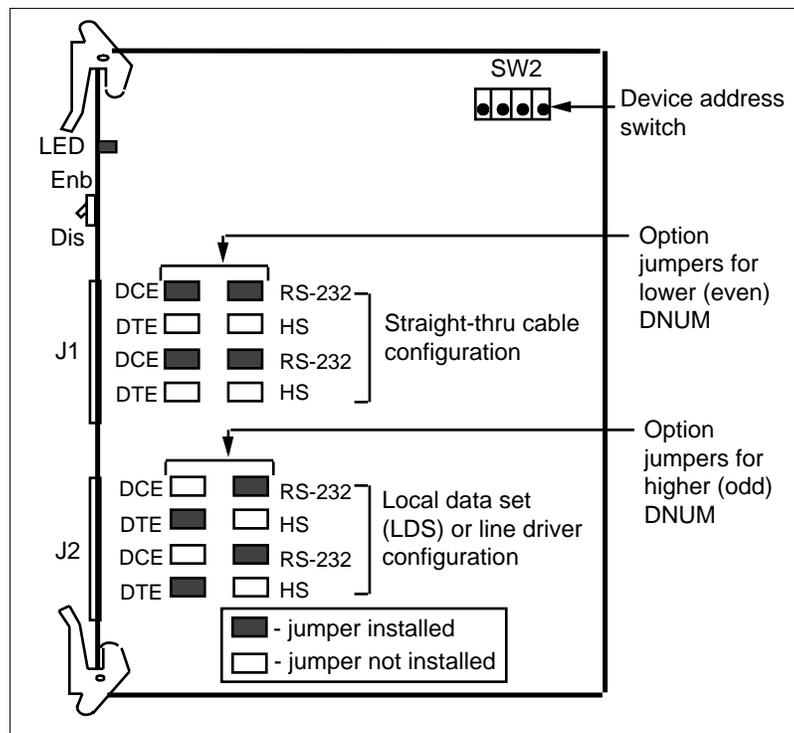


Figure 9-6
QPC513 ESDI card switch settings

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

1 = switch on, 0 = switch off

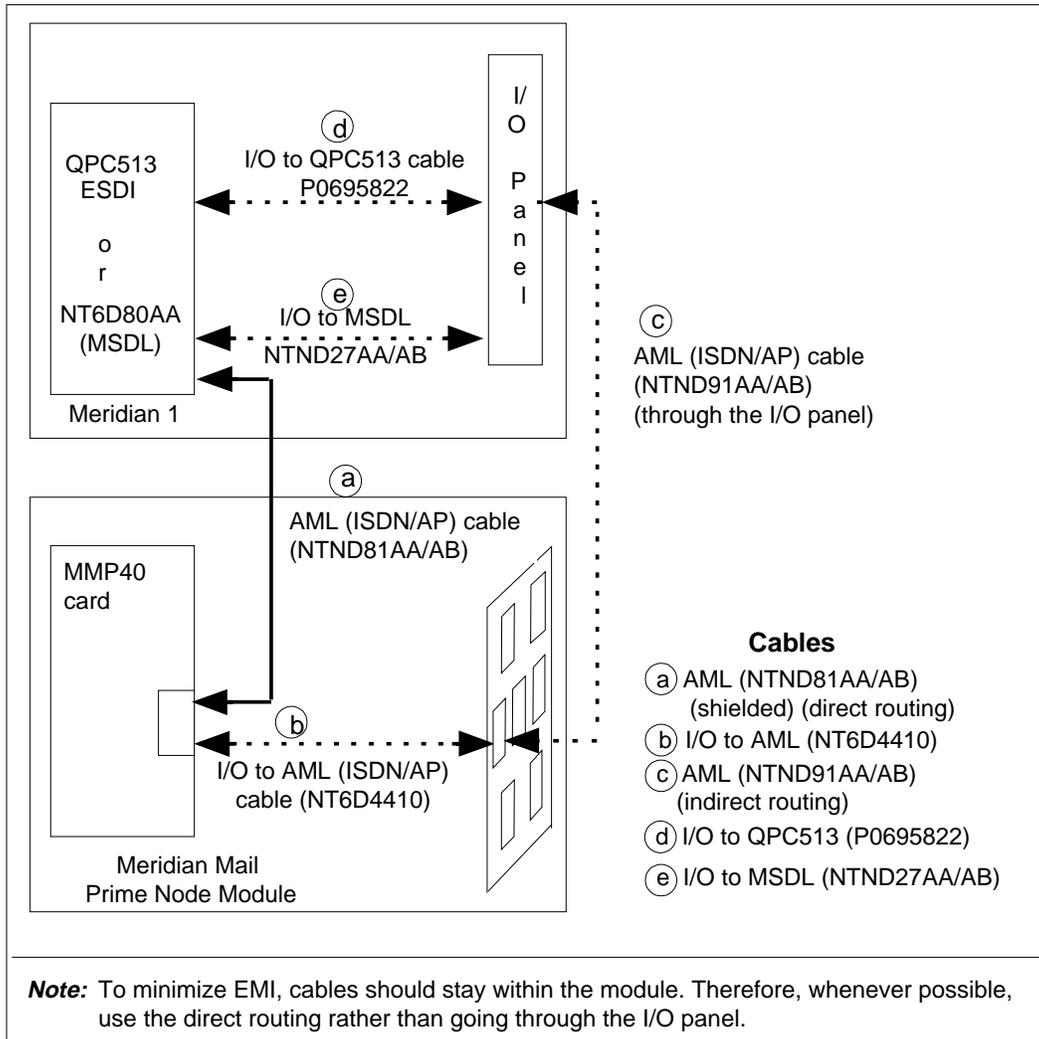
Installing the AML (ISDN/AP) link cabling

Procedure 9-8

Installing the AML (ISDN/AP) link cable

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

Figure 9-7
Cabling between Modular Option and Meridian 1



Chapter 10: Installing and configuring peripheral devices

Meridian Mail peripheral devices

Peripheral devices for Meridian Mail include the following:

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

Note: To get full support from 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 (formerly AdminPlus) package, many of the procedures in this section do not apply. See the documentation set for Meridian Mail Reporter for installation instructions.

Overview of installation

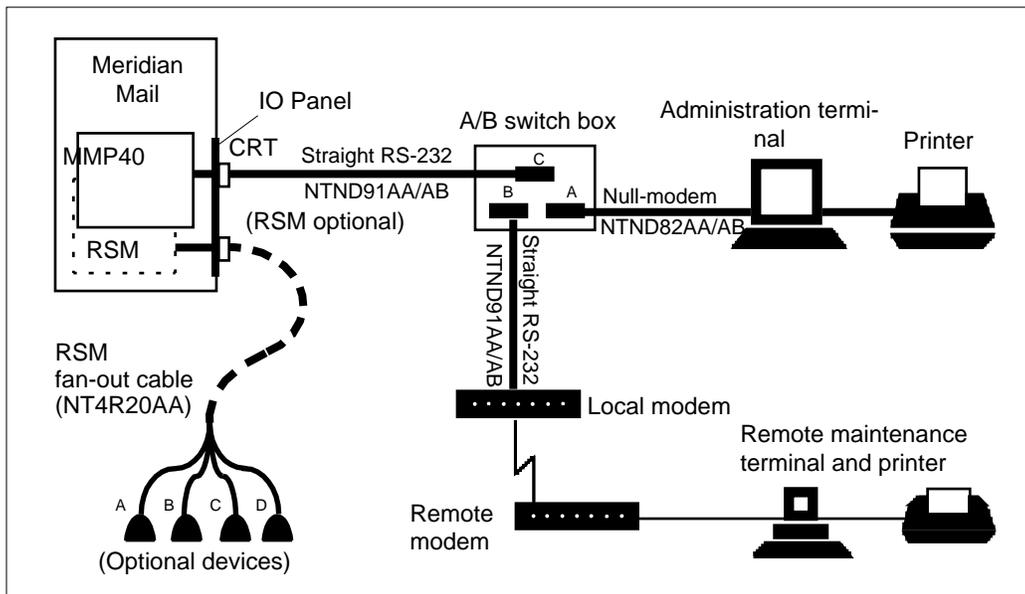
Install peripheral devices as follows (see Figure 10-1 for an overview):

- 1 Install the A/B switchbox if used.
- 2 Install the RSM fanout cables.
- 3 Install and configure the administration terminal.

10-2 Installing and configuring peripheral devices

- 4 Install and configure the administration printer, and connect it to the administration terminal.
- 5 Install the local modem if used.
- 6 Install the remote terminal and modem if used.
- 7 If you have the hospitality feature, install the guest administration consoles (GACs).
- 8 Install networking modems if used.

Figure 10-1
Overview of Meridian Mail peripherals



Installing the A/B switchbox

Procedure 10-1 Installing the A/B switchbox

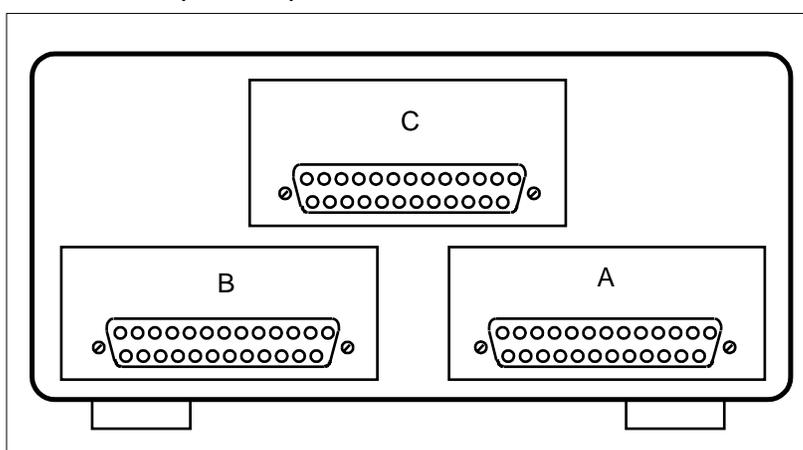
The A/B switchbox (see Figure 10-2) is used when needed to permit remote administration and maintenance.

- 1 Place the A/B switchbox in a suitable location near 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 Put the switch on the front of the A/B switchbox to the "A" position.
 - a. Label this switch position "local."
 - b. Label the other position "remote."

Figure 10-2
A/B switchbox (rear view)



Installing the RSM fanout cable

Procedure 10-2 Installing the RSM fanout cable

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

- 1 Attach an RSM fanout cable to the RSM connector of the I/O panel of each module that contains an RSM.
- 2 Attach peripheral devices as needed to the connectors "A", "B", "C" and "D" at the other end of the fanout cable.
- 3 If necessary, program the RSM ports for the devices you are attaching to them.

See *System Administration Tools* (NTP 555-7001-305) for information about programming the ports.

10-4 Installing and configuring peripheral devices

Table 10-1 shows recommended dataport usage and the correlation between the dataport connectors on the I/O panel and the dataports on the RSM and MMP40 packs in the Meridian Mail modules.

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

Table 10-1
Dataports and their I/O panel connectors

Port	Connector	Allowable uses
Node 1 MMP40 port 1	Module 1 I/O panel CRT	System Console or AdminPlus
Node 1 MMP40 port 2	Module 1 I/O panel CSL	CSL SMDI
Node 1 RSM port 1	Module 1 RSM fanout A	GAC, Network Modem, Printer, ACCESS Link
Node 1 RSM port 2	Module 1 RSM fanout B	GAC, Network Modem, Printer, ACCESS Link
Node 1 RSM port 3	Module 1 RSM fanout C	PMSI Link, GAC, Network Modem, Printer, ACCESS Link
Node 1 RSM port 4	Module 1 RSM fanout D	PMSI Link, GAC, Network Modem, Printer, ACCESS Link
Node 2 MMP40 port 1	Module 2 I/O panel CRT	GAC, Printer
Node 2 MMP40 port 2	Module 2 I/O panel CSL	Maintenance
Node 2 RSM port 1	Module 2 RSM fanout A	GAC, Network Modem, Printer
Node 2 RSM port 2	Module 2 RSM fanout B	GAC, Network Modem, Printer
Node 2 RSM port 3	Module 2 RSM fanout C	GAC, Network Modem, Printer
Node 2 RSM port 4	Module 2 RSM fanout D	GAC, Network Modem, Printer
Node 3 MMP40 port 1	Module 3 I/O panel CRT	GAC, Network Modem, Printer
Node 3 MMP40 port 2	Module 3 I/O panel CSL	Maintenance
Node 3 RSM port 1	Module 3 RSM fanout A	GAC, Network Modem, Printer, ACCESS Link
-continued-		

Table 10-1
Dataports and their I/O panel connectors - continued

Port	Connector	Allowable uses
Node 3 RSM port 2	Module 3 RSM fanout B	GAC, Network Modem, Printer, ACCESS Link
Node 3 RSM port 3	Module 3 RSM fanout C	GAC, Network Modem, Printer, ACCESS Link
Node 3 RSM port 4	Module 3 RSM fanout D	GAC, Network Modem, Printer, ACCESS Link
Node 4 MMP40 port 1	Module 4 I/O panel CRT	GAC, Printer
Node 4 MMP40 port 2	Module 4 I/O panel CSL	Maintenance
Node 4 RSM port 1	Module 4 RSM fanout A	GAC, Network Modem, Printer
Node 4 RSM port 2	Module 4 RSM fanout B	GAC, Network Modem, Printer
Node 4 RSM port 3	Module 4 RSM fanout C	GAC, Network Modem, Printer
Node 4 RSM port 4	Module 4 RSM fanout D	GAC, Network Modem, Printer
Node 5 MMP40 port 1	Module 5 I/O panel CRT	GAC, Printer
Node 5 MMP40 port 2	Module 5 I/O panel CSL	Maintenance
Node 5 RSM port 1	Module 5 RSM fanout A	GAC, Network Modem, Printer
Node 5 RSM port 2	Module 5 RSM fanout B	GAC, Network Modem, Printer
Node 5 RSM port 3	Module 5 RSM fanout C	GAC, Network Modem, Printer
Node 5 RSM port 4	Module 5 RSM fanout D	GAC, Network Modem, Printer
-end-		

Installing the primary administration terminal

Every system requires an administrative terminal.

Procedure 10-3 Installing the primary administration terminal

- 1 Place the administration terminal in a suitable location.
The administration terminal should be installed within 15.24 metres (50 feet) of the Meridian Mail system. If the cable distance is greater than 15.24 metres (50 feet), asynchronous Limited Distance Modems (LDMs) must be used.
- 2 Connect the keyboard and power cord to the terminal.

10-6 Installing and configuring peripheral devices

- 3 Connect one end of a null modem terminal cable (NDND82AA/AB) to the COMM connector on the terminal via an INMAC 328 adapter.
Depending on the type of terminal, you may also have to use a 6- to 25-pin adapter which is supplied with the terminal.
Note: The INMAC328 is a DB25F-F gender adapter.
- 4 If you are not using an A/B switch, connect the other end of the null modem cable to the CRT connector on the Meridian Mail I/O panel.
- 5 If you are using an A/B switch (see Figure 10-1) proceed as follows:
 - a. Connect the other end of the null modem cable to the connector labelled A on the A/B switch.
 - b. Connect one end of a straight RS-232 cable (NTND91AA/AB) to the CRT connector on the Meridian Mail module 1 I/O panel.
 - c. Connect the other end of the straight RS-232 cable to the common connector (usually marked C) of the A/B switchbox.
- 6 Plug the terminal power cord into an AC receptacle.
- 7 Power on the terminal.
- 8 Configure the terminal as described in Appendix A for your type of terminal.

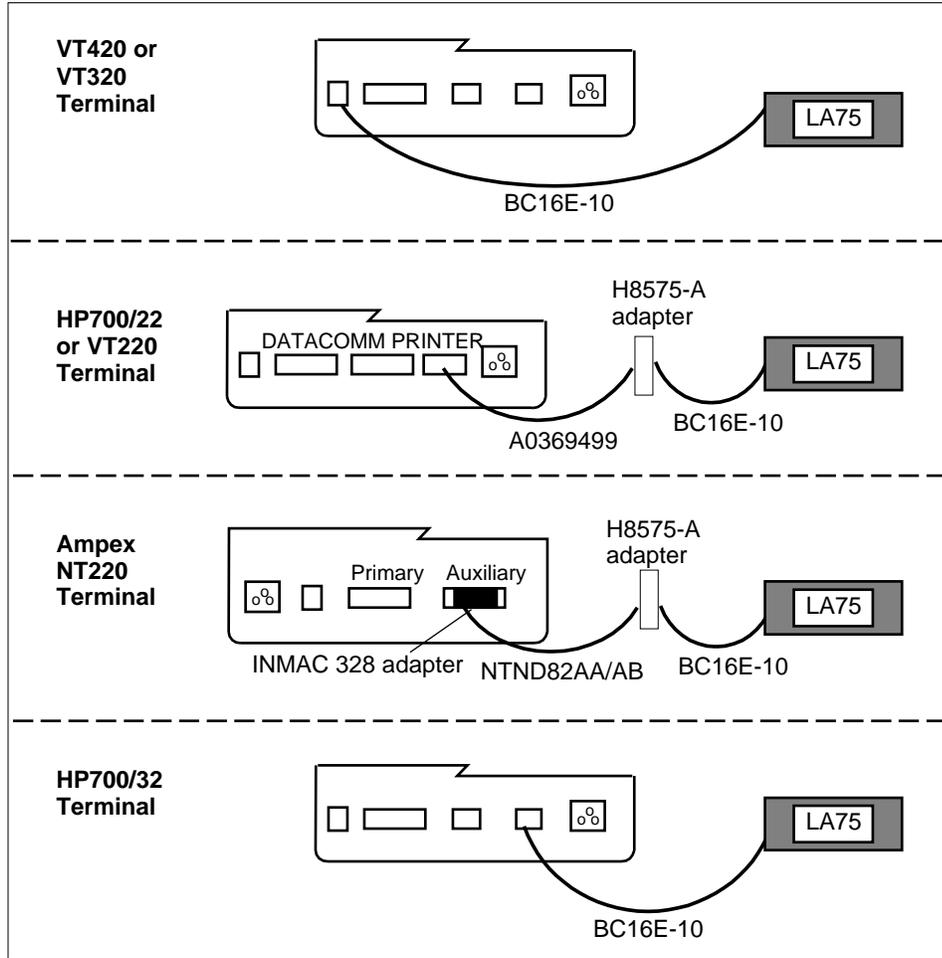
Installing and configuring the LA75 Plus Companion printer

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

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 10-3.
- 4 Connect the other end of the interface cable, using adapters and cables as needed, to the terminal. See Figure 10-3 for details of the required cables and adapters.
- 5 Plug the printer power cord into an AC receptacle.
- 6 Leave the printer powered off to start configuration.
- 7 Configure the printer as described below.

Figure 10-3
LA75 Plus Companion printer connections to administration terminals



Procedure 10-5
Setting up 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 10-4 for the layout of the front panel.

The printer will automatically print out a list of the default settings. When the list is complete, it will go back to the beginning of the list, reprint the first setting, and stop. (That is, it will go back to "Generic 1" and stop.)

Figure 10-4
Front control panel on LA75 Plus Companion printer

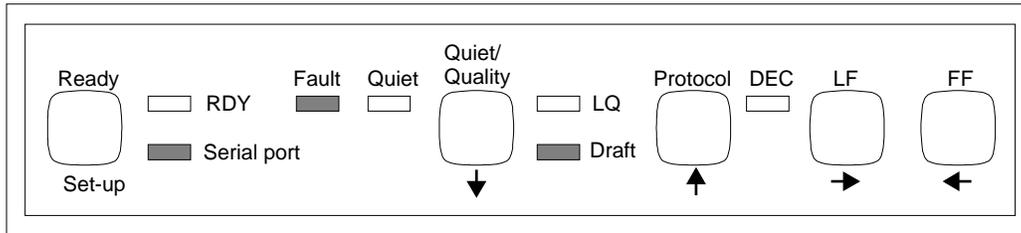


Table 10-2
LA75 printer default settings

Feature number	Name	Required 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
-continued-			

Table 10-2
LA75 printer default settings - continued

Feature number	Name	Required value	Meaning
Generic 10	Error beep	1	One beep
Generic 11	Typestyle	1	Internal
Generic 12	Input buffer size	1	8 K
Generic 13	Disconnect on fault	1	Not selected
DEC 1	Horizontal pitch	7	10 Char. Per In. (80 Col)
DEC 2	GO character pitch	1	U.S. ASCII
DEC 3	User Pref. Char Set.	1	DEC Supplemental
DEC 4	Printer ID	4	Conf. Level 2 (LA75 Plus)
DEC 5	Text Mode Right Marg	2	Wrap
-end-			

- 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 10-2 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 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.

Install and configure 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.

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- 3** Connect one end of the appropriate cable to the back of the printer. See Figure 10-5.
- 4** Connect the other end of the cable, using an adapter if needed, to the terminal. See Figure 10-5 for details of the required cables and adapters.
- 5** Set the printer switches as shown in Tables 10-3 and 10-4. Figure 10-6 shows the location of the switches.
- 6** Plug the printer power cord into an AC receptacle.
- 7** Power on the printer.

Figure 10-5
HP Thinkjet printer connections to administration terminals

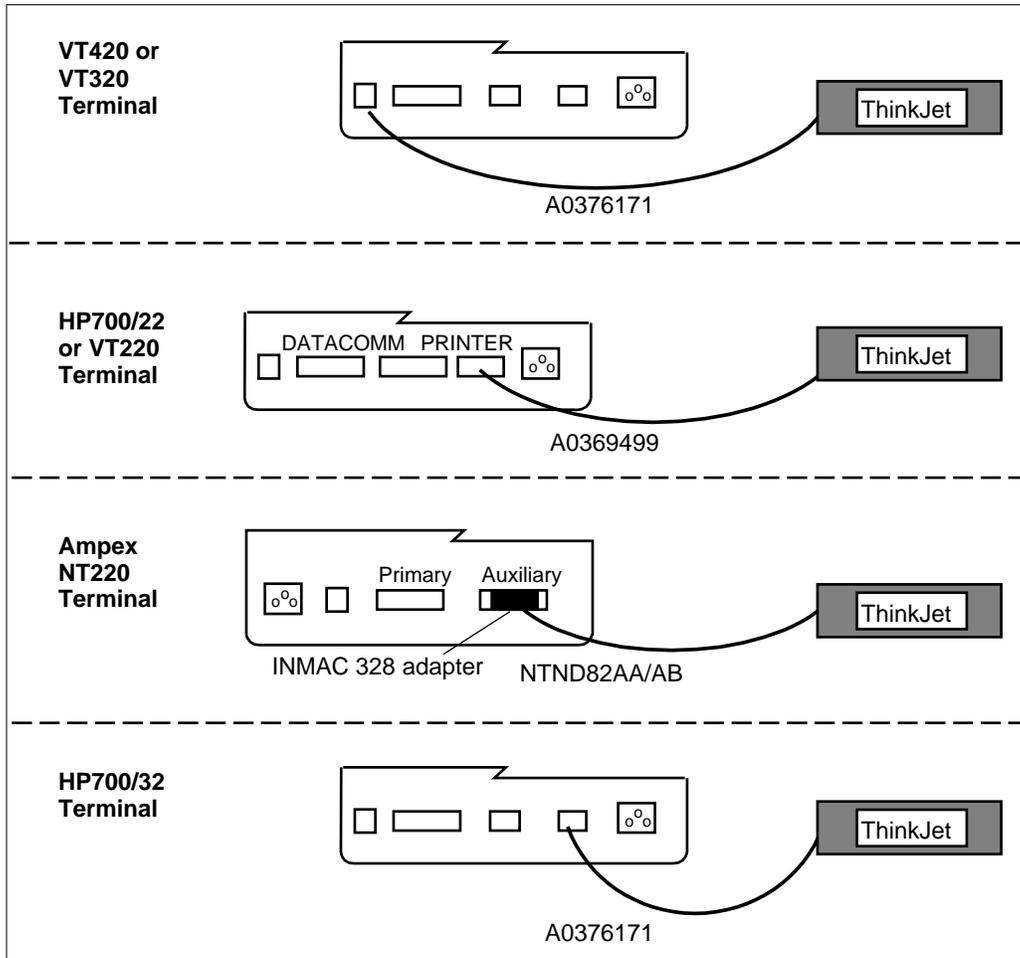


Figure 10-6
HP Thinkjet printer switch locations

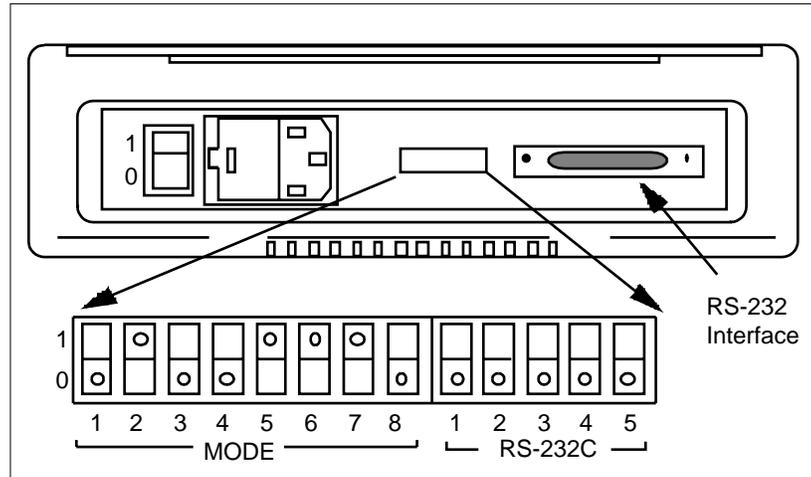


Table 10-3
HP Thinkjet printer mode switch settings

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 10-4
Printer RS-232 switch settings

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

Install and configure modems for remote administration

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

Procedure 10-7

Installing the local modem

- 1 Connect one end of a straight RS-232 cable (NTND91AA/AB) to the modem connector labeled
 - RS232/EIA for Ven-Tel modems
 - DTE for UDS modems
- 2 Connect the modem to the phone line designated for remote administration and maintenance.
- 3 Plug the modem power cord into an AC receptacle.

Procedure 10-8

Configuring the local modem-AT command method

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

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- 8 Connect the free end of the modem cable to the B connector on the switchbox.
- 9 Connect the modem to a convenient phone line.

Configure the remote modem using the administration terminal (optional)

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

Procedure 10-9

Configuring the remote modem using the administration terminal

- 1 If the modem is a Ven-Tel, set the internal switches. Refer to Appendix B, "Modem configuration."
- 2 Connect one end of a straight RS-232 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 Appendix B, "Modem configuration for Remote Access," 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 If the modem is a Ven-Tel, set the internal switches. Refer to Appendix B, "Modem configuration for Remote Access", for configuration procedures for your modem type.
- 2 Place the terminal and the modem in a suitable location.
- 3 Connect the keyboard and power cord to the terminal, and the power cord to the modem.

- 4 Connect one end of a straight-through RS-232 cable to the COMM connector on the terminal via an INMAC 328 adapter. Depending on the type of terminal, you may also have to use a 6 to 25-pin adapter which is supplied with the terminal.
- 5 Connect the other end of the straight RS-232 cable to the modem.
- 6 Plug the terminal and modem power cords into an AC receptacle.
- 7 Power on the terminal and modem.
- 8 Configure the terminal as described in Appendix A for your terminal.
- 9 If you did not already configure the modem, do so now. Refer to Appendix B, "Modem configuration for Remote Access," for configuration procedures for your modem type.

Install a Guest Administration Console

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

Note: If the cable distance between Meridian Mail and the terminal is greater than 15.2 meters (50 feet), line drivers (short haul modems) are required. Ensure that the signalling between line drivers is set up correctly. Ensure that you have the appropriate RS-232 cabling (straight-through for DCE/DTE, and null modem for DCE/DCE or DTE/DTE).

Each GAC can have an optional display-only console attached to the printer port. The display-only console is only required if the Property Management System (PMS) is not equipped to provide voice message waiting indication at checkout time. See Figure 10-7.

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

Procedure 10-11 Installing a Guest Administration Console

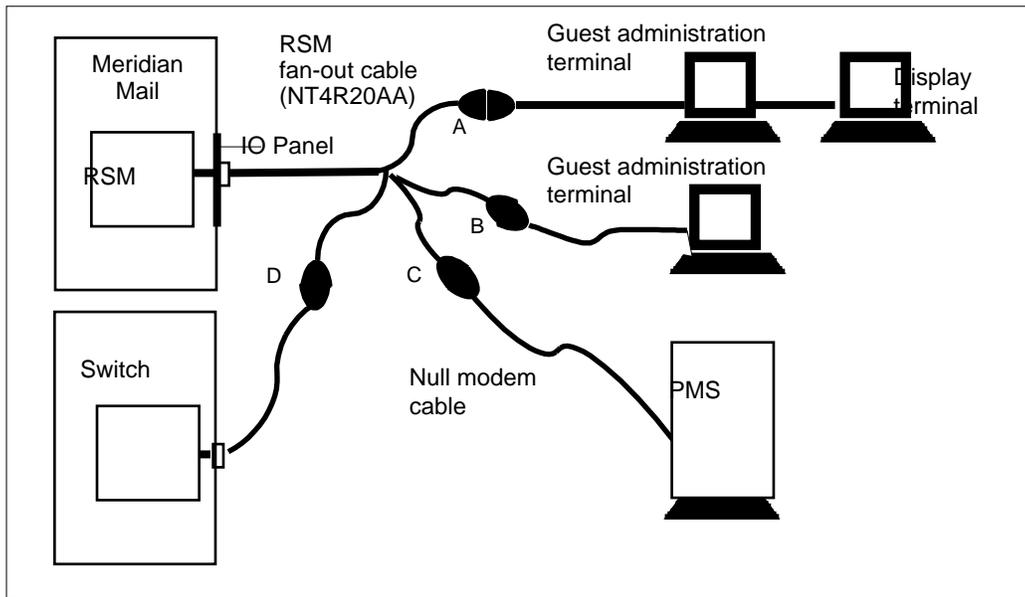
- 1 Connect one end of a null modem cable (from the terminal) to a connector on an RSM fanout cable connected to the Meridian Mail I/O panel, or to a CRT connector on a Meridian Mail I/O panel.

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

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See Table 10-1 for the correspondence between fanout cable connector labels and ports configured during system installation or modification, and for recommended dataport usage. See *System Administration Tools* (NTP 555-7001-305) for information on configuring a dataport.

Figure 10-7
PMS Installation with GAC Terminals



- 2 Connect the other end to the "Comm" connection on the GAC.
- 3 If a display-only console is used on the system, connect one end of a straight-through RS-232 cable to the printer port of the GAC.
- 4 Connect the other end to the "Comm" port on the display-only console.
- 5 Configure the terminal as described in Appendix A.

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

Install a networking modem

Procedure 10-12

Installing a networking modem

- 1 Configure the modem as described in the "Installing Meridian Networking hardware" chapter 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.
- 2 Connect one end of a straight RS-232 cable (NTND91AA) to a connector on an RSM fanout cable attached to the Meridian Mail I/O panel.

This connector must correspond to a port that has been configured for a networking modem. See Table 10-1 for the correspondence between fanout cable connector labels and ports configured during system installation or modification, and for recommended dataport usage. See System Administration Tools (NTP 555-7001-305) for information on configuring a dataport.

- 3 Connect the other end of the cable to the RS232/EIA connector on the modem.

Optional peripheral devices

RSM card and cabling installation

The RS-232 Service Module (RSM) provides four RS-232 ports and alarm capabilities. Figure 10-8 illustrates the cabling involved in these functions. Table 10-5 lists the alarm port and ground cable connections.

Alarms

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

Alarms that show as critical or major on your administration terminal appear in the central office as minor. Alarms that show as minor on your administration terminal do not appear in the central office (see Table 10-6). These alarms are corrected by following the instructions in the SEER reports.

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

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

Table 10-6
Software and hardware alarm status

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

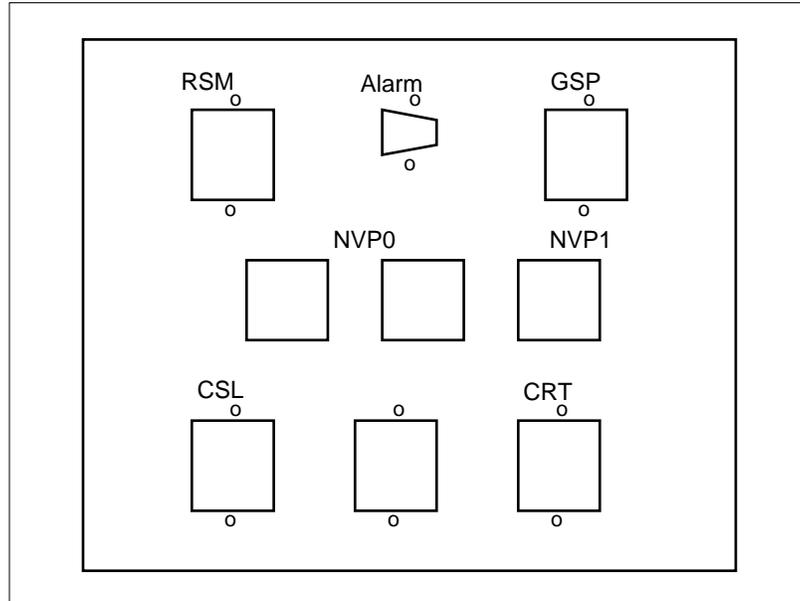
Procedure 10-13

Connecting the alarm

- 1 Connect the power monitor alarm cable (NT8D46BH) from the RSM J2 connector on the Meridian Mail I/O panel to the Main Distribution Frame (MDF). Refer to Figures 10-8 and 10-9.

The pin assignments are detailed in Table 10-5.

Figure 10-9
I/O panel



Installing a new RSM card and cabling

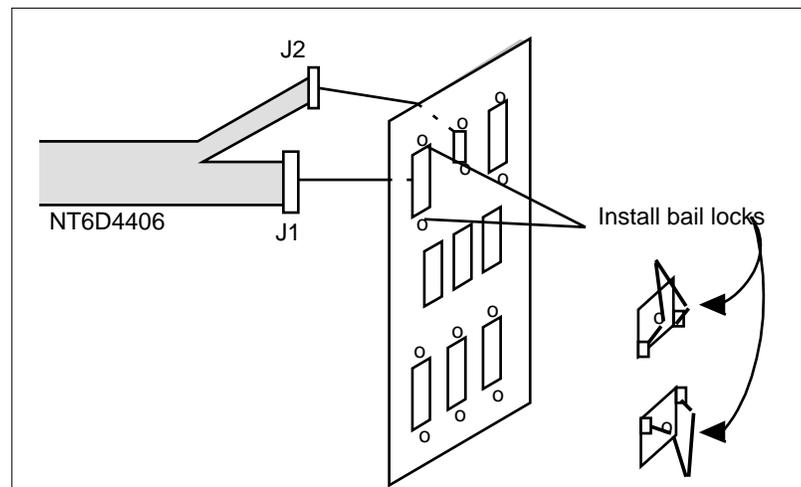
If you need more RS-232 ports than are available on your present system, you may install a new RSM card, either in an open VP/RSM slot or by replacing a VP in a VP/RSM slot.

- 1 Power down the system.
- 2 Remove front and rear covers from the module in which the RSM is to be installed.
- 3 Disconnect cabling at the front of the MMP40 card.
- 4 Disconnect cabling at the front of the NVP cards.
- 5 Remove the NVP cards, label them for the VP/GSP slot 1 to 3, or VP/RSM slot, and carefully put them aside.
- 6 Route the RSM cable (NT6D4406) along the inner panel (just to the right of the RSM card slot) to the rear of the shelf. (Clamps are provided to secure the cable along the panel.)
- 7 Go to the rear of the module and inspect the connector panel.

If the "Alarm" slot is the same size as the "RSM" slot and you are installing the alarm cable, go to the next step. If the "Alarm" slot is smaller than the "RSM" card, go to step 8.

- 8 Optional step: If you have the older-style connector panel, install the adapter plate over the "Alarm" slot. Short screws are provided to secure the plate at the top and bottom.
- 9 Mount the J1 connector onto the port marked "RSM." Secure the bail locks onto the connector. See Figure 10-10.

Figure 10-10
RSM cable to connector panel



- 10 Optional step: Mount the J2 connector onto the port marked "Alarm." Secure the connector with long screws.
- 11 Connect the RSM fanout cable (NT4R20AA) to the RSM connector, and route it to the RS-232 devices you require.
- 12 Install the RSM card in the appropriate slot.
- 13 Connect the RSM cable to the front of the RSM card.
- 14 Reinstall the NVP cards and reconnect the cabling at the front of the cards.
- 15 Reconnect the cables to the front of the MMP40 card.
- 16 Inspect all cables and cards to ensure that they are seated properly.
- 17 Reinstall front and rear covers.
- 18 Power up the system.

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- 19 See *System Installation and Modification Guide* (NTP 555-7001-215) for hardware modification to add the RSM card to the hardware database.
- 20 See *System Administration Tools* (NTP 555-7001-305) to assign data ports using "Modify Hardware" from the Tools Utility Menu.

Table 10-1 shows recommended dataport usage and the correlation between the dataport connectors on the I/O panel and the dataports on the RSM and MMP40 packs in the Meridian Mail modules.

Chapter 11: Configuring the Meridian 1

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

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

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

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

In order to perform the following procedures successfully, 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: 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. Check the required ROM in the following table:

Table 11-1
Required ROM

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

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

**CAUTION****Risk of equipment damage**

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

Single-CPU Meridian 1

Procedure 11-1**Replacing the CPU ROM daughterboard on a single-CPU Meridian 1**

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

- 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 11-2**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 your *X11 Input/Output Guide* (NTP 553-3001-400).
- 7 Take the active CPU out of maintenance mode.
- 8 Use the **SCPU** command (Overlay 35) to switch CPUs.

11-4 Configuring the Meridian 1

- 9 Repeat steps 1 to 7 for the second CPU.
- 10 Exit from Overlay 35 by entering ****.

Configuring the ESDI and AML link

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

- Refer to Table 11-2 for link configuration for X11 Release 17 and earlier.
- Refer to Table 11-3 for link configuration for X11 Release 18 or later. Prompts that are relevant only if you are using an MSDL card are identified by the phrase "MSDL only" in the Description column.

Table 11-2
Overlay 17-ESDI and AML link configuration (X11 Release 17 or earlier)

Prompts	Responses	Description
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.
-continued-		

Table 11-2
Overlay 17-ESDI and AML link configuration (X11 Release 17 or earlier) - continued

Prompts	Responses	Description
ADAN	NEW TTY xx	To add an AML link, where xx is an unused TTY number (0-15) Note: Ensure that this number does not conflict with another device number (for example, FDK if 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.
BPS	(4800) 9600	AML data rate - 4800 for a 68K system 9600 for MMP40.
CLOK	EXT	External clocking arrangement
IADR	3	Data link level HDLC protocol individual address (identifies the Meridian 1 at HDLC data link level).
RADR	1	Data link level HDLC protocol remote address (identifies Meridian Mail at HDLC data link level).
LCTL	YES	Modify link control parameters.
T1	10	Retransmission timer (range 2-20 is in units of 0.5 s; for example, 3 = 1.5 s).
T2	0	Timer for no frame exchange (range 0-255, in seconds)
-continued-		

Table 11-2
Overlay 17-ESDI and AML link configuration (X11 Release 17 or earlier) - continued

Prompts	Responses	Description
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 (DNUM).
CONF	DIR	Link configuration is DIR.
CMS	<cr>	Go on to next prompt.
-continued-		

Table 11-2
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)
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
<p>* 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.</p>		
-end-		

Table 11-3
Overlay 17-AML link configuration (Release 18 or later)

Prompts	Responses	Description
REQ	CHG	Change
TYPE	CFN	Configuration data block
PARM	DTE (DCE)	(MSDL only) Interface transmission mode
ADAN	NEW AML xx (range is 0-15)	The response "NEW AML xx" creates an AML link with a link number xx. The link number can be any number from 0 to 15. It should be the same as the device address switch setting (DNUM) on the ESDI or MSDI card.
CTYP	ESDI or MSDI	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.)
Port	x	(MSDL only) Port number in the range 0 to 3 for the port you are using for AML
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	(4800) 9600	AML data rate - 9600
PARM	R232 DCE	(MSDL only) Interface and transmission mode
CLOK	EXT	(ESDI only) Internal or external clock (Source of the primary clock is either internal or external.)
-continued-		

Table 11-3
Overlay 17-AML link configuration (Release 18 or later) - continued

Prompts	Responses	Description
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	0	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	(ESDI only) Modify link performance thresholds.
ADAN	<Return>	Press <Return> to access the VAS prompt.
VAS	NEW	Add, change, or remove a value added server.
-continued-		

Table 11-3
Overlay 17-AML link configuration (Release 18 or later) - continued

Prompts	Responses	Description
VSID	0-15	VAS identifier (To make it easy to remember this number, use the same number as the AML link number.)
DLOP	<Return>	Press <Return> for the next prompt.
AML	0-15	Application Module Link - should be the same as the AML number for the ADAN prompt
CONF	DIR	Direct CSL configuration
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
-end-		

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 555-7041-200) available.

Procedure 11-3

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 11-4. Press <Return> after each prompt until you get to the next one you need.
- 3 When configuration is complete, enter ****, or type **END** followed by <Return> in response to the prompt REQ.

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

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

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

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

Table 11-4
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 (The default is 4.)
-continued-		

Table 11-4
Overlay 15-Customer data block (continued)

Prompts	Responses	Description
MDID	NO//YES	NO (recommended) - No-answer DID calls are routed to wherever the user wants (including Meridian Mail). YES - No-answer DID calls are routed to Meridian Mail.
NDID	NO/YES	NO (recommended) - No-answer DID calls are routed to wherever the user wants (including Meridian Mail). YES - No-answer DID calls are routed to Meridian Mail.
MWFB	NO/YES	NO (recommended) - No-answer DID calls are routed to wherever the user wants (including Meridian Mail). YES - No-answer DID calls are routed to Meridian Mail.
MATT	YES (NO)	Set to YES, unless Network Message Service (NMS) has been purchased.
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)
-continued-		

Table 11-4
Overlay 15-Customer data block (continued)

Prompts	Responses	Description
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.
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
<p>The flexible call forward DN is the Meridian Mail DN. It is entered in the telephone set data block for each Meridian Mail user.</p> <p>The other options for FNAD, FNAL, and FNAN are:</p> <p>att- route to attendant</p> <p>hnt- route to the hunt DN</p> <p>no- do not route unanswered calls</p>		
-end-		

Configuring the route data block (NMS only)

Procedure 11-4 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 11-4

Configuring route data block

- 1 Load Overlay 16 at the Meridian 1 administration terminal.
- 2 Respond to the prompts as shown in Table 11-5.
- 3 When configuration is complete, reply **END** to the prompt REQ.

Table 11-5
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.
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Defining the Meridian Mail primary ACD queues

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

Procedure 11-5 below shows how to configure the ACD groups for Voice Messaging.

Procedure 11-5 Defining the main Meridian Mail ACD queue

- 1 Load Overlay 23 at the Meridian 1 administration terminal.
- 2 Respond to the prompts as shown in Table 11-6.
- 3 Press <Return> for each prompt that appears after NCFW.
- 4 At the next REQ prompt, enter **END** followed by <Return>.

Table 11-6
Overlay 23-Voice Messaging ACD parameters

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block
CUST		Meridian 1 customer number
ACDN	—	Enter the Meridian Mail main DN. This number should be the same as for VM in the VSDN table.
MWC	YES	This is a Message Center DN.
IMS	YES	This is an Integrated Messaging Service.
CMS	YES	Use the AML Applications Protocol.
IMA	YES	Enable IMS attendant.
IVMS	YES	Integrated Voice Messaging
VSID	—	Enter the VAS ID (0-15). Refer to overlay 17 or 22.
-continued-		

Table 11-6
Overlay 23-Voice Messaging ACD parameters (continued)

Prompts	Responses	Description
MAXP	_____	Maximum number of ACD agents (This should be equal to or greater than the number of voice channels in the installed voice processor cards.)
ALOG	YES	Provide automatic logon for the ACD agents associated with this group.
NCFW	_____	Night Call Forward (This is the destination number for calls rerouted when Meridian Mail is down.)
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
		-end-

Defining the Meridian Mail secondary ACD queues

Procedure 11-6 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 11-6 Defining Voice Services ACD queues

- 1 Load Overlay 23 at the Meridian 1 administration terminal.
- 2 Respond to the prompts as shown in Table 11-7.
- 3 Press <Return> for each prompt that appears after NCFW.

Table 11-7
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 Meridian Mail main DN. (If this is an NMS satellite site, use network format.)
	<Return>	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay

Meridian Mail numbering requirements are slightly different when the Guest Voice Messaging option is installed. Refer to the *System Administration Guide* applicable to your site (NTP 555-7001-30x) where "x" is either 1 for single-customer systems or 2 for multi-customer systems for details.

The following is a list of recommended services/DNs:

- **Guest Messaging DN** This is the DN that is programmed into each phone definition, and is the main DN to be entered in Overlay 23.
- **Public Voice Messaging DN** This is the "published" voice messaging DN for use by staff and guests who want to access messages from outside their rooms. This number (ACDN) is "night call forwarded" to the main DN (Guest Messaging DN).
- **Staff Messaging DN (Optional)** You may choose to have separate ACD queues for staff and guests. This number (ACDN) is "night call forwarded" to the main DN (Guest Messaging DN).

- **Express Messaging DN**
- **Post Check Out DN** This number will be provided to guests upon checkout only. This number (ACDN) is "night call forwarded" to the main DN (Guest Messaging DN).

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 11-7 Programming the network loop

- 1 Load Overlay 22 and print out the Configuration Record. By reading the configuration record, select a loop that is not already reserved.

Note: The maximum number of channels per loop is 24. Meridian Mail can have up to 64 channels.

- 2 Load Overlay 17 and configure the network loop as outlined in the *X11 Input/Output Guide* (NTP 553-3001-400). Refer to the "Common Equipment, 'CEQU'" section.
- 3 Program the Meridian Mail loop by responding to the prompts shown in Table 11-8.
- 4 Print out the configuration record to verify your programming.

Your configuration record will be similar to the example in Figure 1 1-1. In this case, Loop 34 could be supporting Meridian Mail.

Table 11-8
Overlay 17 - Configuring the network loop

Prompts	Responses	Description
REQ	CHG	Change
TYPE	CFN	Configuration data block
.	<Return>	Press <Return> to go to the next prompt.
.		
CEQU	YES	This prompt is the gate-opener for configuring common equipment parameters.
.	<Return>	Press <Return> to go to the next prompt.
.		
TERM	0-159	Enter a loop number you selected for Meridian Mail. TERM means a single density local terminal loop.
TERD	0-159	Enter a loop number you selected for Meridian Mail. TERD means a double density local terminal loop.
TERQ	0-159	Enter a loop number you selected for Meridian Mail. TERQ means a quad density local terminal loop.
	<Return>	Press <Return> until all prompts are finished and your entry is updated.

Figure 11-1
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 11-8

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 Enter LD30.
- 3 STAT and test loop *x* (where '*x*' represents the particular loop being tested) of the network loop following the acceptance testing procedure listed in the *Circuit Card Installation* (NTP 553-3001-211).
- 4 If you receive the message "0 BUSY, 0 DSBL," the loop connected is successfully established.
- 5 If you receive an error message, refer to your X11 Input/Output document to troubleshoot and correct the problem.

Adding ACD agents

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

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

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

Procedure 11-9

Disable ESDI ports

- 1 To disable the link, use the Overlay 48 command:

DIS ESDI n (for X11 Release 17 or earlier) where *n* is the ESDI port number

or

DIS AML n LYR2 (for X11 Release 18 or later) where *n* is the link number.

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

Note 2: Whenever ACD agent data is modified on the Meridian 1, you must make corresponding changes on Meridian Mail. Refer to the "Channel allocation table" section in the "Voice System Administration" chapter of the *System Administration Guide* (NTP 555-7001-30x where "x" is either 1 for single-customer systems or 2 for multi-customer systems) to change DNs. To modify TNs, refer to the "Node configuration" section in the "Modify hardware" chapter of *System Administration Utilities* (NTP 555-7001-305).

**Procedure 11-10
Adding ACD agents (for SL-1 sets only, not 500 sets)**

- 1 Load Overlay 11.
- 2 Respond to the prompts (as shown in Table 11-9) 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 11-9
Overlay 11-ACD agents**

Prompts	Responses	Description
REQ	NEW	
TYPE	SL1	
TN	ll s cc u	Enter an ACD agent TN. Ranges: Single Density Double Density Loop = 0-159 Loop = 0-159 Shelf = 0-1 Shelf = 0-1 Card = 2-3 Card = 2-3 Unit = 0-3 Unit = 0-7
CDEN	ss/dd/4d	single/double/quad density
DES	yyyyyy	ACD agent description of 1-6 characters
CUST	_____	Enter the customer number.
KLS	1	Key loop segment
-continued-		

Table 11-9
Overlay 11-ACD agents (continued)

Prompts	Responses	Description
CLS	VMA	Enter class of service: voice messaging allowed. Use the default for all other Class of Service options.
KEY	0 ACD xxxxxxx yy- yyyyy	Define key 0 as an ACD agent key. DN xxxxxxx is the Meridian Mail DN. ID yyyyyy is any unused DN in the numbering plan and is used to identify the agent position. It is not dialed by users.
	1 SCN zzzzzzz	Define key 1 as a single-call non-ringing DN (SCN-DN). This value is also used when configuring the Channel DN in the Channel Allocation table. See "System Status and Maintenance" in your system administration guide (NTP 555-7001-30x).
	2 MSB	Define key 2 as a Make Set Busy key.
	3 NRD	Define key 3 as a Not Ready key.
	6 TRN	Define key 6 as a Transfer key.
	7 AO3 (letter 'O')	Define key 7 as a Conference key.
	9 RLS	Define key 9 as a Release key.
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.) If you are finished adding agents, continue with the next step and exit. To add another agent, return to the top of the table.
****	Exits the overlay	
		-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.

Enabling ESDI ports (X11 Release 17 or earlier)

Use the link diagnostic program, Overlay 48 (NTP 553-3001-400 Release 18), to enable the ESDI port for the AML link. The procedure outlined below lets you test and set the link up automatically for the AML link port.

Procedure 11-11**Enabling ESDI ports (X11 Release 17 or earlier)**

- 1 Enter **LD 48** to load Overlay program 48.
- 2 Enter **ENL ESDI n** (where "n" is the port number) to enable ESDI port n.
- 3 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.
- 4 Enter **SLFT ESDI n** (where "n" is the port number) to test ESDI port n.

If the system response is other than OK, see the SL-1 maintenance practice (NTP 553-2301-51 1) to analyze the message.
- 5 Enter **DIS ESDI n** to disable ESDI port n.

System responds with "CMS # n active, disable? (y/n)."
Enter Y to disable.
- 6 Enter **ACMS n** to initiate the Auto Setup sequence and establish a link.
- 7 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 and Error Report) when the link is up:

- 25-05 CSL P Link is up

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

Activating the AML link (X11 Release 18 or later)

Use the link diagnostic program, Overlay 48 (NTP 553-3001-400 Release 18), to enable the AML. The procedure outlined below lets you test and set up the AML automatically.

Procedure 11-12

Activating the AML link

- 1 Enter **LD 48** to load Overlay 48.
- 2 Enter **ENL AML n LYR2** to enable AML n.
- 3 Enter **SLFT AML n** to test AML n.

If the system response is other than OK, see the SL-1 maintenance practice (NTP 553-2301-51 1) to analyze the message.

- 4 Enter **DIS AML n LYR2** to disable AML n.
- 5 Enter **ENL AML n ACMS** to initiate the Auto Setup sequence and establish the link.
- 6 Enter ******** to exit from Overlay program 48.

Status messages

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

- ESDA002 (ISDN Applications Protocol Link <n> Link Layer is connected)
- CSA003 - Active ISDN Applications Protocol Link <n> is up

Meridian Mail will issue the following SEER (System Event and 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).

Setting call routing options for user telephone sets

Set call routing options for each user's set as shown in Overlay 10 (Table 11-10) for 2500 sets and Overlay 11 (Table 11-11) 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 11-10) and FDN (Overlay 11, Table 11-11). Otherwise, do not respond to these prompts.
- **Call Forward All Calls** If Call Forward All Calls is enabled (this is controlled at the telephone set) and there is no answer at the call forward DN, the call is routed to Meridian Mail.
- **Call Forward Busy** A call to a busy number is routed to the Meridian Mail Service unless one of the following conditions exists:
 - The call is Direct Inward Dial (DID), and Call Forward Busy on DID calls is disabled for the customer (see Overlay 15).
 - The Call Waiting feature is enabled for the user in one of the following two forms:
 - Call Waiting (applies to incoming trunk calls)
 - Station-to-Station Call Waiting (applies to internal calls)
- **Routing to Hunt DNs** If the user has a hunt DN defined, then the call is routed to the Hunt DN. If there is a no answer/busy condition at the Hunt DN, the call is routed to the Meridian Mail mailbox for the originally called DN.
- **Message Waiting Indication** A user is notified of a new message by a lit message-waiting 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 11-10
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 is allowed (denied).
	LPA (LPD)	Message-waiting lamp is equipped (not equipped). If a lamp is not equipped, users are notified by interrupted dial tone.
FTR	DTN	Digitone class of service
	FDN HTA	Hunting allowed.
	CFW yy	Call forward all calls. yy is the DN length (4-23).
-continued-		

Table 11-10
Overlay 10-2500 set data (continued)

Prompts	Responses	Description
FTR	FDN xxxx	xxxx is the flexible call forward no answer DN (Meridian Mail DN).
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
-end-		

Table 11-11
Overlay 11-Meridian 1 set data

Prompts	Responses	Description
REQ	NEW, CHG	
TYPE	___	Type of set (for example, SL1, 2317, 3000)
TN	lll s cc uu	Terminal number: loop, shelf, card, unit
CDEN	sd, (dd), 4d	Card density: single, double, or quadruple
CUST	___	Customer number
FDN	___	Flexible call forward no answer DN (Meridian Mail DN)
CLS	HTA	Hunt is allowed.
	MWA	Message waiting is allowed.
	FNA	Call forward no answer is allowed.
	FBA (FBD)	Call forward busy is allowed (denied).
HUNT	___	Hunt (internal) DN
KEY	0 SCR xxxx	Single call ringing DN, where xxxx is the user's DN
-continued-		

Table 11-11
Overlay 11-Meridian 1 set data (continued)

Prompts	Responses	Description
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.
	1-9 AO3	Add a 3-party conference key. This is necessary for some basic Meridian Mail features.
	1-9 CFW yy xxxx	Call forward all calls (where yy is the maximum DN length and xxxx is the call forward DN).
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay
-end-		

Saving Meridian 1 changes

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

Procedure 11-13

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 12: Starting up and configuring Meridian Mail

This chapter assumes that Meridian Mail software has already been installed on your system. If Meridian Mail has not already been installed, please do the installation before proceeding. Refer to the *System Installation and Modification Guide* (NTP 555-7001-215), for more information. Software tapes (Install/data tapes) are included with your system to allow you to reinstall Meridian Mail in case of problems, and to allow you to perform hardware modifications and other specialized functions. Do not load software from the tapes unless specifically instructed to do so.

Starting up Meridian Mail

Procedure 12-1 Starting up Meridian Mail

Note: If any problems occur during startup, see Chapter 13, "Troubleshooting startup problems."

- 1 Power on the administration terminal and other peripheral devices.
- 2 On the administration terminal, press <Ctrl> and W. Then wait for Logon/Status to appear. Press P to select printer.

The word "Aut" appears at the bottom of the terminal screen to indicate that automatic printing is turned on. The automatic printing allows you to capture a printout of the bootup messages when you power on the Meridian Mail system. The bootup messages that should appear are outlined in Chapter 13. 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 that chapter.

12-2 Starting up and configuring Meridian Mail

- 3 Before you power up the Meridian Mail system, look at Table 12-1, 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 12-1).

Table 12-1
Starting up Meridian Mailbehavior of LED indicators

Location of LED	Color	Behavior
Power supplies	Green	On while power switch (DC) or shelf breaker (AC) is on
VP	Red	On while power to node is on
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. See table 13-1 for more information.)

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

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

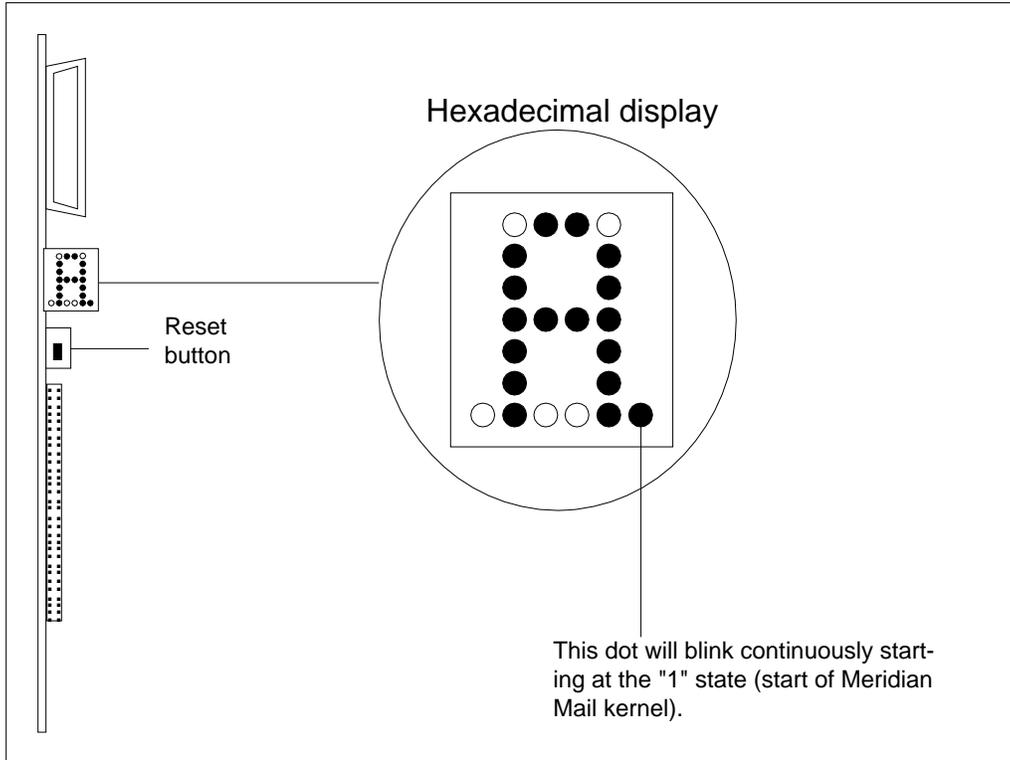
If these LEDs do not behave as described, consult Chapter 13 of this manual.

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.

Figure 12-1
Hexadecimal display on MMP40 card



ATTENTION

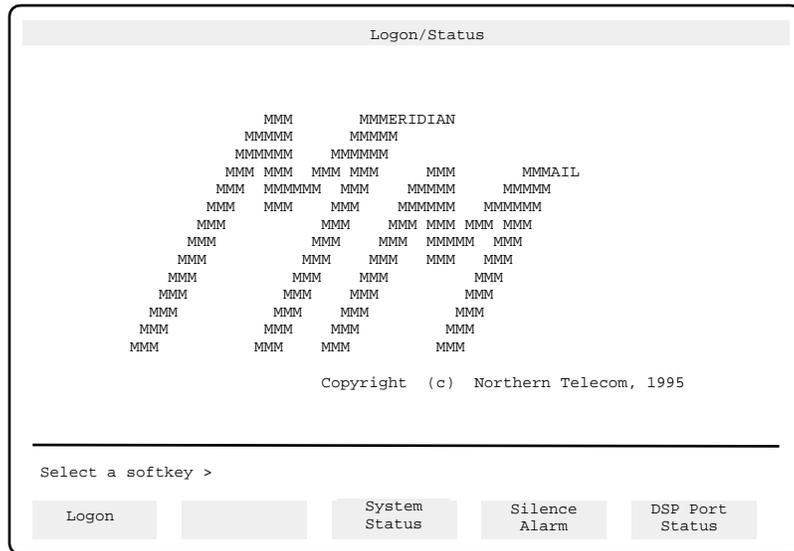
To reduce stress on the system, use the RESET button on the faceplate of the MMP40 card to reboot the system instead of powering the cabinet off and on. Reset Node 1 first, then Nodes 2 through 5 in sequence as applicable.

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.

12-4 Starting up and configuring Meridian Mail

- 6 On the MMP40 card, check that the hexadecimal display shows "A."
The "A" indicates that the bootup was successfully completed on that node. If the hexadecimal display does not read "A" when bootup and bootROM diagnostics are completed, refer to Chapter 13. Table 13-1 in Chapter 13 provides a description of the usual progression of the hexadecimal display.
- 7 Check the hard copy of bootup messages. Compare the printout to that shown in Table 13-2 in Chapter 13. If the system stops at a point in the bootup or does not behave as expected, follow the troubleshooting procedure in that chapter.
- 8 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.
- 9 Check the terminal display by pressing <Ctrl><w> simultaneously.
 - 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>.
- 10 Perform the procedures in the Software Installation chapter of *System Installation and Maintenance (NTP 555-7001-215)* .
When you have completed these procedures and the software has loaded, the Logon screen appears. See Figure 12-2.

Figure 12-2
The Logon screen



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

Node Status should be InService for all of your nodes, and DSP Port Status should be idle for all of the voice ports you have installed. See Figure 12-3. For a full description of this screen, see your system administration guide.

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

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

Figure 12-3
System Status screen

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											
Node	Type	Status	Active	Idle	DSP Port	Status	OutSv	Faulty	Pending	Others	Storage Used
1	MSP	InService	0	16	0	0	0	0	0	0	1% 4%
2	SPN	InService	0	16	0	0	0	0	0	0	1% 4%
3	SPN	InService	0	16	0	0	0	0	0	0	1% 4%
4	SPN	InService	0	16	0	0	0	0	0	0	1% 4%
5	SPN	InService	0	16	0	0	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 "Hardware modification" chapter in the *Meridian Mail System Administration Tools* (NTP 555-7001-305).
- 13 If all appears to be OK, press [Exit] to return to the Logon screen.
- 14 Logon to the system and change the default logon password.
- 15 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, theVentel 9600 Plus II), and the connection fails, wait 15 seconds before attempting to reconnect.
- 16 Reset the switch to "Local."
- 17 Check that the customer number is correct on the General Options screen selected from the General Administration menu.

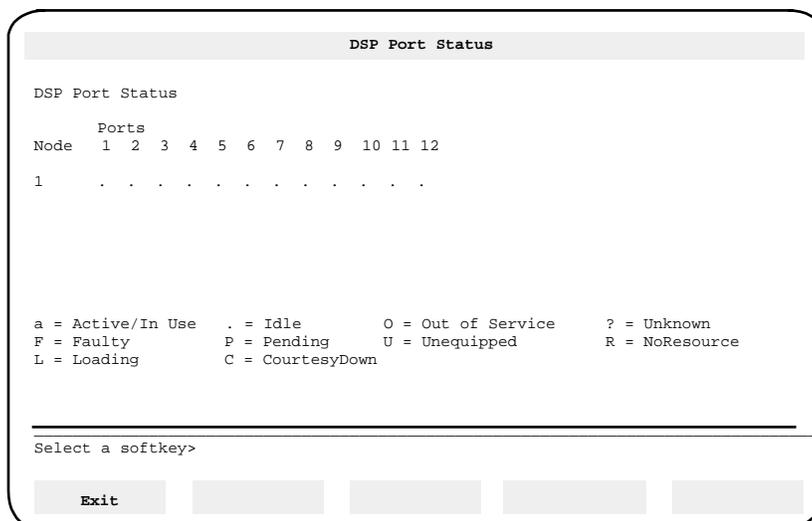
Note 1: The system is delivered with ACD agent TNs and DN as well as the main voice messaging DN (as defined in Voice System Administration, Channel Allocation Table) already configured. If the values shown on the status screen are missing or incorrect, see *Meridian Mail System Administration Tools*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

Note 2: For details on Meridian Mail configuration, refer to the section on setting up the system in the *Meridian Mail System Administration Guide* applicable to your systems (NTP 555-7001-30x where "x" is 1 for single-customer systems or 2 for multi-customer systems).

- 18 Set up the voice service DN's (Voice Messaging, Express Messaging, and so on). Use the Voice Service DN Table screen accessed through the Voice Administration menu.
- 19 Check the system by adding some mailboxes and using some Meridian Mail features.
- 20 Logout.
- 21 Check the status of each DSP port to make sure they are all functional by selecting the [DSP Port Status] option. Port status should be Idle for all of your ports. See Figure 12-4.

Note: For a full description of this screen, see your 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 22 to 25.

Figure 12-4
DSP Port Status screen



* This softkey is a toggle. When in Range Mode, the softkey is [Change to Single Mode].

- 22 While watching this screen, dial the voice mail access DN from a phone connected to the switch.
- 23 Verify the entries in the Voice Service Directory Number (VSDN) table.
- 24 Note which channels become active.
- 25 Ensure there is no noise on the line.
- 26 Release the line, and repeat steps 22 to 25 until all ports have been tested.
- 27 If all appears to be OK, press [Exit] to return to the Logon screen.
- 28 Replace the faceplates that cover the PCPs.
Note: Caution is required when folding and positioning the new SCSI cable. The cable has to be twisted to ensure proper lineup of the pins. Also ensure the cable is properly folded and positioned away from the edges, or it may become pinched when replacing the metal cover.
- 29 Install the I/O covers and the front and rear doors of the modules.

Configuring Meridian Mail

When the Meridian Mail logon screen appears, follow the instructions below.

Note: After any changes are made, the system must be rebooted. To reboot the system, power it down for 10, seconds then power it back on.

- 1 Once it has rebooted, verify that the system is working properly by adding some mailboxes and trying some Meridian Mail features.
- 2 Ensure that the customer number (as defined in the General System Administration menu, under system options) is correct.

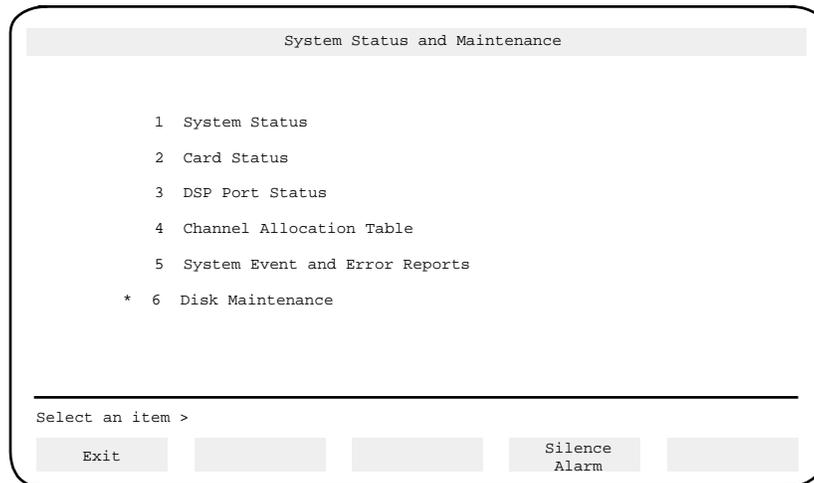
Enabling/disabling disk shadowing

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 interruption of service.

Procedure 12-2
Enabling/disabling disk shadowing

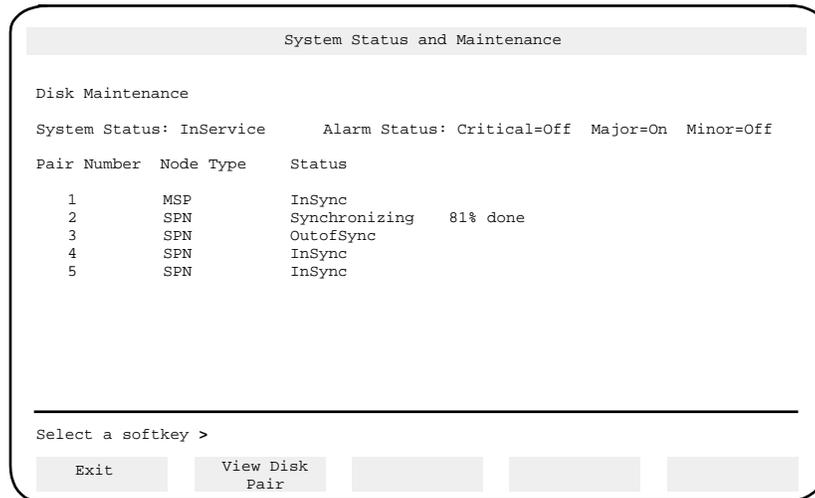
- 1 Log on to Meridian Mail.
- 2 Select System Status and Maintenance. (See Figure 12-5.)
- 3 Select Disk Maintenance. (See Figure 12-6.)
- 4 Press the [View Disk Pair] softkey.
You are prompted for the number of the disk pair you want to view .
- 5 Enter the number of the disk pair.
The Disk Pair Status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

Figure 12-5
The System Status and Maintenance screen



*This item is available only if Disk shadowing is installed.

Figure 12-6
Disk Maintenance screen



The Disk Maintenance screen (Figure 12-6) shows the status of each disk pair in the system. The three possible states for a disk pair are "InSync", "Syncing," and "OutOfSync."

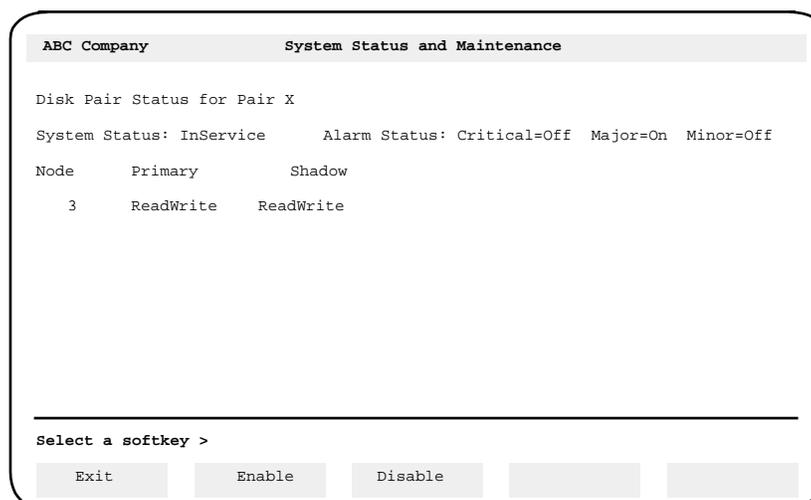
The following fields are displayed on the Disk Maintenance screen:

- **System Status** This field displays the current system status.
- **Alarm Status** This field indicates whether or not there are any Critical, Major, or Minor alarms.
- **Pair Number** This is the number of each disk pair in the system.
- **Node Type** This is the type of node on which the pair resides.
- **Status** This is the synchronization status. A disk pair can be in one of the following states:
 - **InSynch** Both disks are operational and in sync with each other.
 - **Synching** The disks are currently synching (that is, after pressing [Enable] in the Disk Pair Status screen).

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

If a SEER has alerted you to the fact that the system has automatically taken a disk out of service, check the Disk Pair Status by pressing the [View Disk Pair] softkey to determine which pair is out of synch. When you press [View Disk Pair], the Disk Pair Status screen appears (Figure 12-7).

Figure 12-7
The Disk Pair Status screen



The following fields are displayed on this screen:

- **System Status** This is the current system status.
- **Alarm Status** This field indicates whether there are any critical, major or minor alarms.
- **Node** This is the node on which the disks reside.
- **Primary** This field indicates the status of the primary disk.
- **Shadow** This field indicates the status of the shadowed disk. A disk may be in one of the following states:

- *ReadWrite* indicates that the disk is currently available to be read and written to. A disk that is in this state is operating normally.
- *NoAccess* indicates that the disk is not available to be read or written to. This indicates that the disk has been disabled automatically by the system or by the administrator with the [Disable] softkey.
- *SynchSource* during a disk sync, indicates that the disk is the source of a disk synchronization.
- *SynchDestination* during a disk sync, indicates that the disk is the destination of a disk synchronization.

Acceptance testing of Meridian Mail

Procedure 12-3

Acceptance testing of Meridian Mail

- 1 Check basic features by performing all functions outlined in the *Meridian Mail User Guide* (P0730459).
- 2 Test system and administrative features as described in the *Meridian Mail System Administration Guide* applicable to your system (NTP 555-7001-30x where "x" is either 1 for single-customer systems or 2 for multi-customer systems).
- 3 Test optional features using the appropriate NTP. See the *Meridian Mail NTP Contents Overview* (NTP 555-7001-000) for NTP listings.
- 4 Replace module side panels and front and rear doors.

Chapter 13: 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. If you need to power down the entire system, it is recommended that you begin by performing a courtesy-down procedure on the system, then disable the node(s), and, finally, power down the system. This ensures that users do not experience abrupt termination of service.

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

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

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

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

Reference documents

- *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 single board computer must first initialize itself and perform self-diagnostics. Then it boots up the other system elements (non-prime nodes and the disk subsystem) and performs diagnostics on them. Finally, it loads the Meridian Mail operating system and the user interface. The MMP40 initialization phase can be monitored using the hexadecimal display on the edge of the card, while the bootstrap can usually be monitored using the text displayed on the terminal (although the two will overlap at some points). The following sections describe the hexadecimal display and the progression through bootstrap.

ATTENTION

If you encounter difficulty during a normal startup sequence, refer to the MMP40 Troubleshooting Flowcharts in Appendix D to determine causes and solutions for potential problems with the MMP40 card.

Power on initialization-hexadecimal display description

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

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

Table 13-1 shows the typical progression of the startup indications on the hexadecimal display.

Table 13-1
Typical startup indications on hexadecimal display

Display shows	Description
. .	Power on (displays <i>very</i> 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)

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 13-2 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 hard copy of the bootup sequence as described in Procedure 13-1.

If bootup does not proceed as described in Table 13-2, look in the "Symptom" column of Table 13-3 to identify the problem, and then follow the corresponding steps in the "Possible causes and actions" column.

Procedure 13-1

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.
"AUT." disappears from the bottom of the screen.
- 4 Compare the bootup printout to the information presented in Table 13-2.

Table 13-2
Bootup stages

Stage	Key phrases	Comments
1	<pre> Waiting for timer... . . . Copyright 19yy, Northern Telecom ***** * NT4R45aa Firmware * * MMP40FW * * Mmmm DD, 19YY * ***** . . . </pre>	<p>where "aa" can be any two letters and "Mmmm DD, 19YY" is the date of the firmware's release</p>
2	<pre> 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 . . . </pre>	<p>Executing board level diagnosticse</p>
3	<pre> Performing SCSI Bus Reset...OK. . . . </pre>	
4	<pre> SCSI initialization complete. . . . </pre>	
-continued-		

13-6 Troubleshooting startup problems

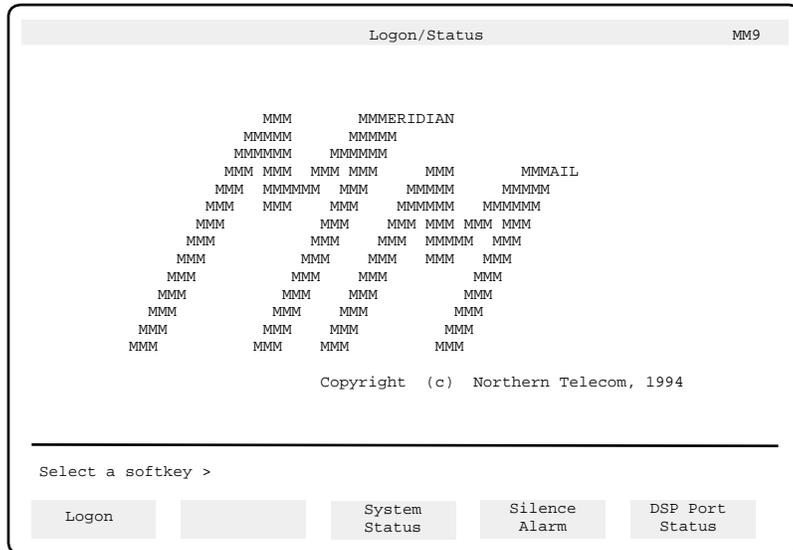
Table 13-2
Bootup stages (continued)

Stage	Key phrases	Comments
5	Meridian Mail Kernel Startup . . .	
6	OSP successfully loaded . . .	Terminal screen should clear. Operating system is loaded on the node.
7	Enter CI to Load CI Only (5 sec) . . .	
8	Loading PRM . . . Program Resource Manager Ver. x . . .	where "x" can be a combination of characters or digits
9	PRM: Waiting for Seer Server to register . . . PRM RebootNode: resetting node 2 waittime 0 . . .	SEER output on the printer should be expected a few seconds after this message. If this is a multi-node system, then all the non-prime nodes will be reset here.
10	PRM Running startup diagnostics . . . PRM: OSP is Up - node 2 . . .	Diagnostic programs are run. On multi-node systems, operating system (OS) is loaded on non-prime nodes.
-continued-		

Table 13-2
Bootup stages (continued)

Stage	Key phrases	Comments
11	PRM: Startup diags finished, starting up system	Application programs are to be loaded.
12	The Logon screen comes up as shown in Figure 13-1.	
-end-		

Figure 13-1
The Logon screen



Check status

Check the system status to make sure the channels are functional and all links are up. Press the [System Status] softkey. Node Status should be InService for all of your nodes, link status should be InService, and DSP Port Status should be Idle for all of the voice ports you have installed. See Figure 13-2.

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.

13-8 Troubleshooting startup problems

See the "System status and maintenance" chapter in the *System Administration Guide* for further information on the status of the system, link, nodes, and ports.

If bootup does not proceed as described above, look in the "Symptom" column of Table 13-3 to identify the problem, and then follow the corresponding steps in the "Possible causes and actions" column.

Figure 13-2
System Status screen

The screenshot shows the 'System Status and Maintenance' screen. At the top, it displays 'System Status: InService' and 'Alarm Status: Critical = Off Major = Off Minor = On'. Below this, it shows 'Last Event: 41-97 VoiceBase Loading on Node 1' with a timestamp of '4/19 16:31'. The 'Link Status: 1-7-2: InService' is also indicated. A table follows, detailing the status of five nodes (Node 1 to Node 5). Each node is an SPN (Service Port Node) and is 'InService'. The table includes columns for 'Active' and 'Idle' counts, 'DSP Port Status' (OutSv, Faulty, Pending, Other), and 'Storage Used' (Voice and Text percentages). At the bottom, there is a 'Select a softkey >' prompt and five softkey buttons, with the first one labeled 'Exit'.

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

Table 13-3
Troubleshooting bootup problems

Symptom	Possible causes and actions
Admin terminal screen remains blank.	Follow Procedure 13-2, "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.	<p>Check SEERs for failed hardware diagnostics. Follow the actions documented for the SEERs in the <i>Maintenance Messages (SEERS) Guide</i> (NTP 555-7001-510).</p> <p>If all non-prime nodes (type SPN) are faulty, check the system bus. Follow Procedure 13-20, "Diagnosing system bus problems."</p> <p>If only one node is faulty, run out-of-service diagnostics on that node's MMP40 card.</p>
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 <i>Maintenance Messages (SEERS) Guide</i> (NTP 555-7001-510).
Node continually reboots.	<ol style="list-style-type: none"> 1 Replace the MMP40 card. 2 Perform the system bus checks. Follow Procedure 13-20, "Diagnosing system bus problems."
Logon screen appears, but not all voice channels come into service.	<p>Look at the DSP Port Status screen. Ports may be left Faulty or unconfigured due to hardware problems.</p> <p>Ports may be left Loading, Pending, or No Resources due to configuration or software problems.</p> <p>Run out-of-services diagnostics as described in your administration guide and then enable the voice card.</p>
There are disk errors on bootup-device sense key, or driver errors.	Refer to Procedures 13-13 and 13-14, and the section entitled "Common disk subsystem problems", in Chapter 16 of this manual. i
All nodes time-out while booting, or nodes unload while in service.	Perform the system bus checks. Follow Procedure 13-20, "Diagnosing system bus problems."
-continued-	

13-10 Troubleshooting startup problems

Table 13-3
Troubleshooting bootup problems (continued)

Symptom	Possible causes and actions
Only one node comes up.	Perform the system bus checks. Follow Procedure 13-20, "Diagnosing system bus problems."
Logon screen appears, but link status is not InService.	Go to Chapter 17, AML (ISDN/AP) 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 Northern Telecom 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 <i>System Administration Guide</i> , NTP 555-7001-301.
Hexadecimal display on MMP40 card shows D .	Indicates in-service trouble. While the MMP40 card is still healthy, a component such as an NVP card or a disk may be faulty. Check the NVP cards for that node and perform Procedures 13-13 and 13-14, and refer to Chapter 16.
On the MMP40 card hexadecimal display, the blinking dot (during states "1" and later) has stopped blinking.	Indicates a potential software problem or faulty display. Note the state at which the dot stopped blinking and whether or not the system is running normally. Reboot the system and observe the display. If the problem persists, contact your Northern Telecom 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 point at which the state reverts to ".0.", and contact your Northern Telecom 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 Northern Telecom support organization.
-end-	

Troubleshooting terminal problems

The procedures contained in the following sections should allow you to determine if there is a problem with your Meridian Mail terminal or the prime node MMP40 PCP. Follow each step in the troubleshooting procedure until you have solved the problem.

Procedure 13-2

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 may be a problem with the terminal.
Go to step 2 if the terminal power light is not lit, or else go to step 3 if the MMP40 card's hexadecimal display is blank.
- 2 If the power light on the terminal is not lit, check for power problems as follows:
 - a. Check that the terminal power switch is ON.
 - b. Verify that there is power at the socket the terminal is plugged in to.
 - c. Check the power cord, and replace if necessary.
 - d. If all of the above tests are OK, replace the terminal.
 - e. Check the terminal cabling and setup as described in Procedure 13-3.
 - f. If the power LED remains unlit, replace the prime node's MMP40 card and restart the system.
- 3 If the hexadecimal display remains blank, proceed as follows:
 - a. Check for Meridian Mail power problems as described in Procedures 13-4 to 13-8.
 - b. Replace the prime node's MMP40 card and restart the system.
- 4 If the hexadecimal display is displaying information but the screen remains blank, there may be a problem with the MMP40 card or, with internal or external RS-232 cables. Check the RS-232 cables and replace the MMP40 card or cards, and restart the system.
- 5 If none of these steps succeeds in solving the problem, contact your Northern Telecom support organization.

Procedure 13-3
Check terminal cables and setup

- 1 Make sure your terminal is installed and configured as described in Appendix A 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."

- 4 Ensure that the "Hold screen" key is not on. If the terminal indicates "Hold" (status area at bottom of screen or LED on keyboard), press <F1> to release the hold. This applies to all terminals except the HP700/32 where the user "Aux Mode" is set to "off."
- 5 Check all cable connections to terminal.
- 6 Replace cables and adapters one at a time.
- 7 Check printer setup and status.
Refer to Chapter 10 of this manual for correct printer setup.
- 8 Clear any printer faults (out of paper, paper jam), and put printer online.
- 9 To make sure the terminal is functional, enter setup mode, change the terminal setup to enable 'LOCAL ECHO' and, with the printer attached, enter text from the terminal keyboard.

The text you enter from the keyboard should echo on the terminal screen.

- 10 Disable 'LOCAL ECHO.'
- 11 Check terminal primary port using method described in the terminal owner's manual.
- 12 Add a null modem adapter if one was not installed between Meridian Mail and the terminal. Remove the null modem adapter if one was installed.
- 13 If all of the above tests are OK and none of the replacements fixes the problem, replace the terminal.

Procedure 13-4
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, go to the section on DC system power problems or AC system power problems as appropriate.

Procedure 13-5
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 13-6 and test the pedestal power supply.
- 3 If no LEDs are lit on any module above a certain module, go to Procedure 13-7 and test the power harness at the lowest module with no LEDs lit.
- 4 If no LEDs, including the LEDs on the DCEPS, are lit on a single module or on a single side of a module, go to Procedure 13-8 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 13-6
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 and the corresponding BATRTN terminal lug designations. See Figures 13-3 (NT7D67CA PDU) and Figure 13-4 (NT6D53AA PDU).

Note: The voltage between BAT2 and BAT3 and their corresponding BATRTN terminals is zero unless you have three or four modules in the column.

- b. If voltage measured is incorrect, there may be a problem with the UPS system.

See *SL-1 Fault Clearing* (NTP 553-3001-510) for testing procedures of the UPS.

13-14 Troubleshooting startup problems

- 2 If the voltage is correct, go to Procedure 13-7 and test the power harness at the lowest module with no LEDs lit.

Figure 13-3
Universal DC pedestal, NT7D67CA

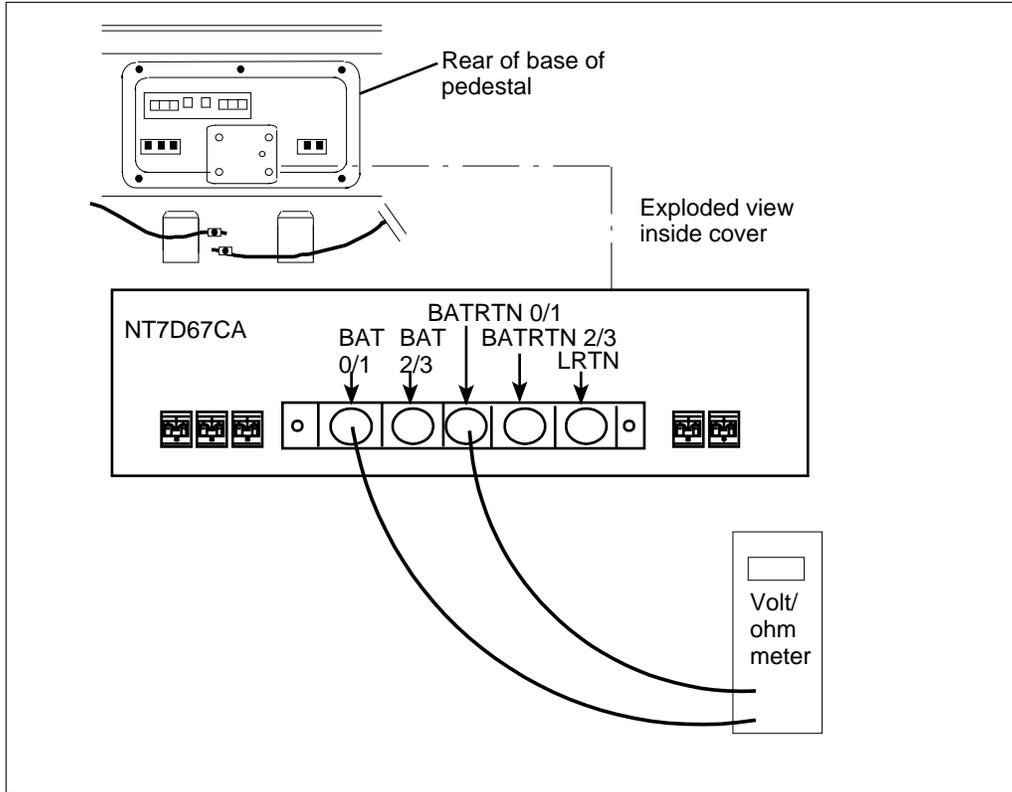
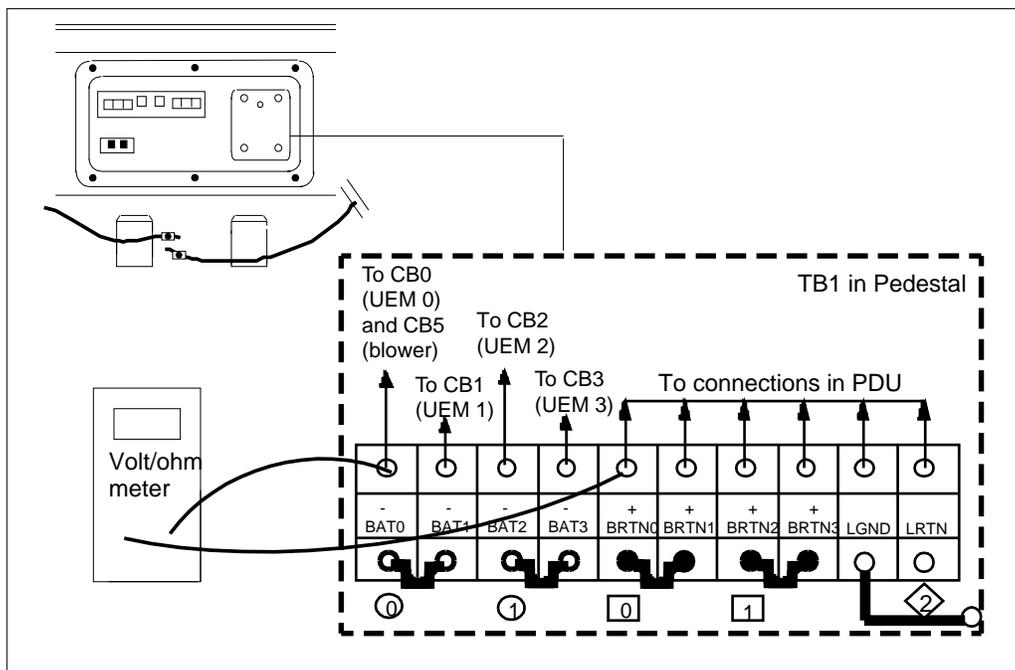


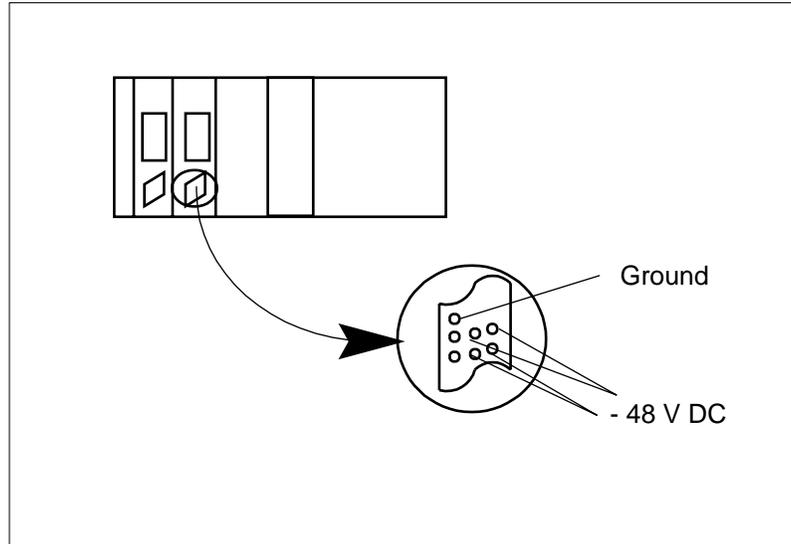
Figure 13-4
DC pedestal, NT6D53AA



Procedure 13-7
Test the power harness

- 1 Check DC voltage at DCEPS connectors (Figure 13-5).
 - a. Switch off both DCEPS on the module.
 - b. Remove both DCEPS.
 - c. Check the voltage at the pins shown in Figure 13-5.
 - 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 13-8, Test the DCEPS.

Figure 13-5
Front view of module, DCEPS or CEPS removed



Procedure 13-8
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, see the section entitled "System fails to boot completely."

AC system power problems

Procedure 13-9
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 13-10 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 13-11 and test the CEPS.

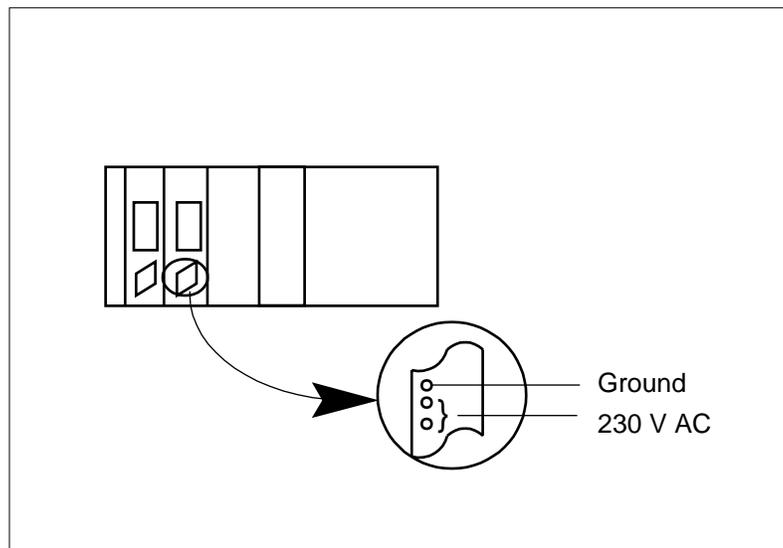
Note: A side of a module which contains a power supply but no PCPs or disk drives will give a CEPS failure indicator.

Procedure 13-10

Test the power harness and pedestal power supply

- 1 Check AC voltage at CEPS connectors (Figure 13-6).
 - a. Switch off both breakers on the module.
 - b. Remove both CEPS.
 - c. Check the voltage at the pins shown in Figure 13-6.
 - d. If voltage is incorrect, refer to *SL-1 Fault Clearing* (NTP 553-3001-510).
- 2 If voltage is correct, continue with Procedure 13-11, Test the CEPS.

Figure 13-6
Front view of module, CEPS removed



Procedure 13-11

Test the CEPS

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

System fails to boot completely

If the system stops during the process of booting up, refer to Table 13-2 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 Chapter 7 (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" earlier 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 13-1.

Once you have determined which stage the system is stopping at, refer to Table 13-4 to find which procedure to follow.

Table 13-4
Troubleshooting bootup stages

Stage	Procedure
1 or 2	13-12
3	13-13
4	13-14
5, 6, or 7	13-15
8	13-16
9	13-17
10	13-18
11	13-19
12	Check the SEERs output. Follow the actions suggested in the <i>Maintenance Messages (SEERS) Guide</i> (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 Northern Telecom support organization.

Procedure 13-12
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....," proceed as follows:

- 1 Replace the High Availability Bus Controller (HABC) card.
- 2 Replace the MMP40 card.
- 3 Check for Meridian Mail power problems as described in Procedures 13-4 to 13-8.
- 4 Check that the PCP switch settings are as described in Chapter 7.
- 5 Verify that all cards in the system are properly seated.
- 6 If the terminal output has stopped at some other point in the procedure, do the following:
 - a. Replace the MMP40 card.
 - b. Check for Meridian Mail power problems as described in Procedures 13-4 to 13-8.
 - c. Replace the HABC card.

Procedure 13-13
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 cable installation, especially the connection to the backplane, and the jumper settings. Refer to the disk drive figures in Chapter 5 of this manual.
- 3 Check the voltage to disk and tape (+5 V, +12 V).
- 4 If on a non-prime node, replace the MMP40 board.
- 5 Replace disk as described in Chapter 5, "Disk Installation," of this manual.

Procedure 13-14
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 13-13.
- 2 Check that the SCSI devices are terminated as described in the "Disk installation" section in Chapter 5 of this manual.
- 3 Check that the tape drive is unterminated as described in the "Replacement of tape drive" section in Chapter 15 of this manual.
- 4 If the bootup display shows error messages such as "bus error," this can indicate a serious problem with your SCSI disk. Contact your Northern Telecom support organization.

Procedure 13-15
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 your SCSI disk.
- 2 Contact your Northern Telecom support organization.

Procedure 13-16

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 Northern Telecom support organization.

Procedure 13-17

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 has indication that some of the non-prime nodes are not responding, check the power supply for those nodes.
- 4 Power the system down, then power it back up to reset the system. If the boot still fails at the same point, replace the MMP40 cards of the affected nodes.
- 5 If the problem occurs on all the remote nodes, perform the system bus diagnostics (Procedure 13-20).

Procedure 13-18

Troubleshooting stage 10 bootup failure

This stage should normally take approximately five minutes. However, on a multinode system, if a remote node is having problems booting up, then this state can take as long as 20 minutes. 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, then 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, then follow Procedure 13-20, "Diagnosing system bus problems."

Procedure 13-19
Troubleshooting stage 11 bootup failure

If the bootup fails during this stage, proceed as follows:

- 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 Northern Telecom support organization.
- 3 If Node 1 is InService but the system will not progress past stage 10, proceed as follows:
 - a. Replace the MMP40 card in Node 1.
 - b. Check for Meridian Mail power problems as described in Procedures 13-4 to 13-8.
 - c. If the problem is occurring on all nodes, follow Procedure 13-20, "Diagnosing system bus problems."

System bus diagnostics and fault clearing

Procedure 13-20
Diagnosing system bus problems

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

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

- 7 Replace the HABC.
- 8 Restart the system.

Procedure 13-21

Clearing system configuration faults

- 1 Check the switch settings on all printed circuit packs on the node.
- 2 Verify the switch settings on the MMP40.
- 3 Replace the MMP40 card.
- 4 Verify proper connection of terminators on multi-node systems at each end of the ribbon cable bus.

Note: The HABC card has a fuse that may blow if a terminator or cable (at HABC and MMP40 last node) is defective.

- 5 Replace bus terminators.

No SCSI addresses during bootup

Procedure 13-22

No SCSI address 0 during bootup of Meridian Mail

Use the following procedure if the system will not boot up from the disk drive.

- 1 With power on, verify voltages on TB1. See Table 13-5 and Figure 13-7 for correct voltages relative to ground.
- 2 Power system down.
- 3 Reseat power supplies if voltages are not correct on TB1.
- 4 If the voltages are still not correct, the power supplies may be defective. Verify by substituting with new power supplies.
- 5 Reseat disk, tape, disk/tape drive packs.
- 6 Verify that the SCSI cable between the disk drive and the connector at the back of the MSU cage is securely connected at both ends.
 - a. If the SCSI cable is suspected to be defective, substitute another disk drive pack.

Figure 13-7
Location of terminal block TB1

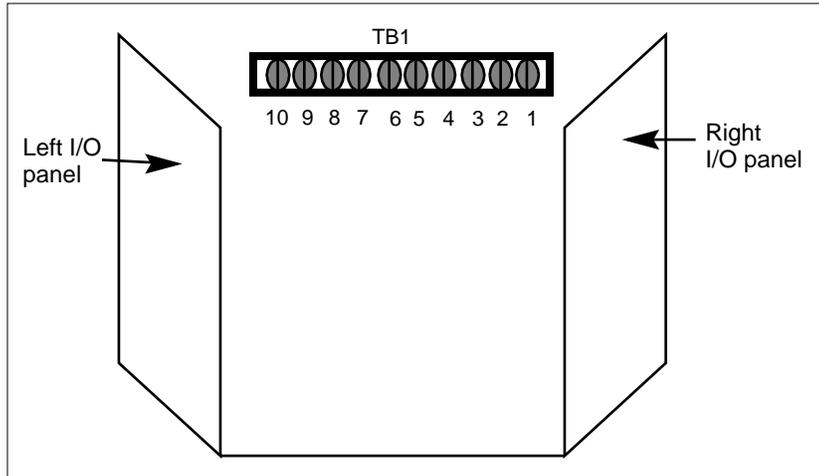


Table 13-5
DC voltage at TB1

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

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

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

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

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

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

Procedure 13-23

NO SCSI address 1 during bootup of Meridian Mail

- 1 With power on, verify voltages on TB1. See Table 13-5 and Figure 13-7 to verify DC voltages.
- 2 Power system down.
- 3 Reseat power supplies if voltages are not correct on TB1.
- 4 If the voltages are still not correct, the power supplies may be defective. Verify by substituting with new power supplies.
- 5 Reseat tape or disk/tape drive pack, and ensure it is firmly seated.
- 6 Verify that the SCSI cable between the tape drive and the connector at the back of the MSU cage is securely attached at both ends.
- 7 Reseat tape drive pack and ensure it is firmly seated.
- 8 In an unshadowed prime node, swap the tape drive pack with the disk drive pack.

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

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

- 9 If the TB1 voltages are correct, and the tape drive does not work in either slot but the disk drive does work in both MSU slots, suspect a defective tape drive pack. Replace the drive.
- 10 If the disk drive does not work in the tape drive MSU slot, suspect an out-of-alignment connector or a defective backplane connector. Replace as required.

Procedure 13-24

NO SCSI address 2 during bootup of Meridian Mail

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

- 1 With power on, verify voltages on TB1. See Table 13-5 and Figure 13-7 to verify voltages.
- 2 Power system down.
- 3 Reseat power supplies if voltages are not correct on TB1.

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

Chapter 14: Troubleshooting operational problems

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

Find the description of your problem in the "Symptom" column of Table 14-1, then refer to the procedure referenced in the "Procedure" column. If the system is producing SEERs related to your problem, you should also refer to the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510). If you cannot resolve the problem, contact your Nortel support organization.

Table 14-1
Troubleshooting operational problems

Symptom	Procedure
<i>System level problems</i>	
System running; then goes down	14-1
System status remains FAULTY	14-2
"Service is unavailable" when calling Meridian Mail	14-3
<i>AML (ISDN/AP) link problems</i>	
System status shows "Faulty link to PBX"	14-4
-continued-	

Table 14-1 (continued)
Troubleshooting operational problems

Symptom	Procedure
<i>Voice card/channel problems</i>	
Channel status is "Faulty" or "OutOfService"	14-5
Channel status remains "Loading"	14-6
Silent channel-calls have no voice and produce a SEER	14-7
Silent channel-calls have no voice and <i>do not</i> produce a SEER	14-8
Channel status IDLE, but cannot be acquired	14-9
<i>Administration problems</i>	
Cannot logon remotely	14-10
Terminal responds, yet logon is unsuccessful	14-11
Optional feature purchased, but unavailable	14-12
Voice services-sub-menu revert DN doesn't work	14-13
Problems backing up the system (disk to tape or tape to disk)	14-14
<i>User-reported problems</i>	
User hears "Your mailbox is full ... your mailbox is empty" after a node is rebooted	14-15
Message Waiting Indicator (MWI) does not light on any telephone sets	14-16
Message waiting indication is delayed	14-17
Call Sender doesn't work for any calls	14-18
Revert DN does not work	14-19
-end-	

System-level problems

Procedure 14-1

System running; then goes down

System is running normally and then goes down for no apparent reason.

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

Procedure 14-2

System status remains FAULTY

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

- 1 Check SEER printout for related messages.
Take action appropriate for the SEER message as described in *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).
If SEERs indicate Digital Signal Processor (DSP) driver problems, verify the network cable is secure. For subsequent troubleshooting, replace the network loop cable, then replace the Voice Processor pack.
- 2 Courtesy down the system, then activate the system.
Refer to the *Meridian Mail System Administration Guide* (NTP 555-7001-301 or 555-7001-302 if you are a Multi-Customer site) for instructions on how to courtesy down and reinitiate 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.

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Refer to Chapter 9 of this manual for AML hardware setup, Chapter 1 for AML programming, and Chapter 17 for AML link maintenance commands.

- 5 Determine if any nodes show Faulty or OutOfService status.
If any nodes do show either status, follow the fault clearing procedures for the following components:
 - card cage problems
 - system fails to boot completely
 - disk subsystem check
 - no SCSI address 0, 1, or 2
- 6 Determine if any of the voice cards show Faulty or OutOfService status.
If a voice card shows Faulty or OutOfService status
 - a. Disable the card. For detailed instructions on disabling the card, refer to the *Meridian Mail Administration Guide* (NTP 555-7001-301) if you are servicing a non multi-customer site, or *Meridian Mail Multi-customer Systems Administration Guide* (NTP 555-7001-303) if you are servicing a multi-customer site.
 - b. Perform OutOfService diagnostics.
 - c. Reenable the card.

Procedure 14-3 **"Service is unavailable" when calling Meridian Mail**

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 Check that the Meridian 1 has been properly configured (refer to Chapter 11 of this manual, "Configuring the PBX").
- 2 Verify that the Meridian Mail DN is properly configured in the VSDN table.
See the System Administration Guide (NTP 555-7001-301 or 555-7001-303 depending on your system) for configuration details.
- 3 Check that the AML link is up on the Meridian 1 (link status) by checking Overlay 48, AML status.
- 4 Verify that the primary DN in the Meridian Mail Channel Allocation Table (CAT) matches the Main ACD Queue DN in the Meridian 1.
- 5 Make sure the VASID in the Main ACD Queue DN matches the VASID in the Meridian 1 Configuration Record.

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

AML (ISDN/AP) link problems

Procedure 14-4

System status shows "Faulty link to PBX"

- 1 Ensure that the AML (ISDN/AP) cable is in place and secure.
- 2 Check that the Meridian 1 has been properly configured. Refer to Chapter 9 of this manual for AML hardware setup, Chapter 11 for AML programming, and Chapter 17 for AML link maintenance commands.
- 3 Check other hardware addressing such as SDI ports or D-channel ports to ensure they are not assigned the same hardware address as the MSDL/ESDI ports.
- 4 Make sure the MSDL switch settings or ESDI switch settings and card option plugs are installed in the correct locations.
- 5 Program the unassigned port of the ESDI card in the Meridian 1 configuration record, and perform the self test as outlined in Overlay 48. See the *X11 Input Output Guide* (NTP 553-3001-400).

Note: The MSDL requires the selftest only.

- Disable the MSDL/ESDI port (See Chapter 5).
 - Perform Autoset for the MSDL/ESDI port.
- 6 Check the Meridian 1 to make sure traffic is flowing by placing a phone call to Meridian Mail and watching the channel status on the System Status screen or the DSP Port Status screen.

Voice card/channel problems

Procedure 14-5

Channel status is "faulty" or "out of service"

- 1 Check network loop cable connections along the network loop path from the backplane of Meridian Mail to the QPC414 in the Meridian 1.
- 2 Check the jumper board on the backplane to make sure it is secure.
- 3 Ensure that the voice cards in the correct node are properly seated.

Note: The term 'voice card' used in the procedures below refers to NVP cards.

14-6 Troubleshooting operational problems

- 4 Verify the database in Meridian 1 and the Channel Allocation Table (CAT).
- 5 Check the DTA100 code on the Meridian 1.
- 6 Check the status of agents in Meridian 1 (in Overlay 32). See the *X11 Input Output Guide* (NTP 553-3001-400).
 - 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: You should see a DTA101 message if the agent was disabled.

Note: 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. Replace the voice card if the diagnostics fail. See your system administration guide for details.
- 8 Check the SEER printout for any VSS load errors for that particular channel.
 - a. **STAT L S C U**
- 9 Check the SEER printout for any driver fault messages (software messages) for that channel. Refer to *the Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510) for interpretation of these SEERs, and take corrective measures.

If VPH complains about too many driver restarts for a particular channel, reenabling the channel online simply by disabling and then reenabling that specific channel.
- 10 Replace the voice card.

Procedure 14-6 **Channel status remains "Loading"**

- 1 Verify that the Meridian Mail channel has a corresponding ACD agent programmed in the Meridian 1.
- 2 Verify that the Network loop voice cable is connected properly on both the Meridian Mail and Meridian 1.

- 3 The Channel Allocation Table data must match the SCN DN on KEY 1 of each ACD agent as follows:

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

Procedure 14-7

Silent channel - calls have no voice and produce a SEER

- 1 Check that the network loop cable terminator is installed. Refer to Chapter 9 of this manual.
- 2 Check the status of channels by placing a call and watching the status of the channel on the Meridian Mail administration terminal at the System status screen or DSP Port Status screen. 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, verify that the network loop cable from Meridian Mail to the Meridian 1 is securely attached at both ends. If it is, check the SEER printout for any messages related to that channel, and take the appropriate action for that SEER.
- 3 Make sure that Meridian Mail has been configured with valid TNs and DNs by checking the CAT table. See your system administration manual.
 - a. If CAT is incorrect, disable the card as described in the *System Administration Guide* (NTP 555-7001-301, 302, or 303).
 - b. Log in to TOOLS utility level and use the Hardware Administration utility to modify the TNs accordingly.
 - c. Change DNs in the CAT table.
 - d. Perform OutOfService diagnostics and reenale channels. Refer to your system administration guide.
- 4 Ensure that each network loop is configured on the Meridian 1 by performing loop diagnostics in LD 30. Refer to *X11 Input/Output Guide* (NTP 553-3001-400).
- 5 Disable the voice cards,
 - a. Reseat the voice cards.
 - b. Perform Out-of-service diagnostics.
 - c. Reenable the voice cards.

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- 6 Disable and unseat the QPC414 in the Meridian 1. This step will suspend call processing. This is not recommended during peak business hours.
 - a. Reseat the QPC414.
 - b. Reenable the QPC414.
 - c. Initialize the Meridian 1.
- 7 Replace the network loop cable.
- 8 Replace the voice card.
- 9 If these procedures are unsuccessful, escalate to your support organization.

Procedure 14-8

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

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

Procedure 14-9

Channel status IDLE, but cannot be acquired

- 1 Check the status of the channels.
- 2 Check the SEER printout for messages related to that channel.
- 3 Take the appropriate action for that SEER.
- 4 Disable, then reenable the channel on the Meridian 1.
- 5 Verify that the network cable is connected to the assigned port.
- 6 Verify that the VASID in the Meridian 1 configuration record matches the VASID in the Main Meridian Mail ACD queue.
- 7 Verify correct data entry for the VSDN table and for the Channel Allocation Table. See your system administration guide for details.

Note: If these procedures are unsuccessful, record detailed information and contact your Nortel support organization.

Administration problems

Procedure 14-10

Cannot logon remotely

See the "Troubleshooting terminal problems" section in Chapter 13 of this manual.

Verify that the local administration terminal, printer, modem, and remote administration terminal are all set up correctly according to Chapter 10 of this manual.

Procedure 14-11

Terminal responds yet logon is unsuccessful

- 1 Check that you are entering the correct password.
- 2 Check to ensure that the timestamp has been received by Meridian Mail.
 - a. Check the latest SEER for the timestamp.
 - b. Load Overlay 2 in the Meridian 1 and issue a TTAD command and verify that the timestamp has the current time.
 - c. If the timestamp is not accurate, set the time in Meridian 1 by using the STAD command. Refer to *X11 Input/Output Guide* (NTP 553-3001-400).
- 3 If this is your fourth failed logon attempt, wait 10 minutes before trying again.

Procedure 14-12

Optional feature purchased but unavailable

- 1 Verify the installed features from the General System Administration.
- 2 If the feature is not present, attempt to add a feature from the Install/data tape.
- 3 Check the SEER printout for any incorrect data entries such as keycode number or serial number.

If the keycode is not correct, contact your support organization to obtain the correct keycode.
- 4 Verify that the features were ordered correctly.

Procedure 14-13

Voice services-sub-menu revert DN doesn't work

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

Procedure 14-14

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

- 1 Ensure that you are using the correct disk or tape for backup.
Not all disks and tapes are appropriate for all system configurations. See the System Administration Guide, (NTP 555-7001-301), for details. Additional units can be purchased from your Nortel sales representative. If you do not receive tapes with a new system, report the problem to your sales representative.
- 2 Examine SEER printouts for information on where the error is occurring.
Consult the Maintenance Messages (SEERs) Guide (NTP 555-7001-510) for each relevant SEER and the appropriate action to take for that SEER.
- 3 Verify that the DC voltage is correct at the DCEPS connectors. See Chapter 1.
- 4 Verify that all SCSI cable connections are secure.
- 5 Ensure that the tape drive or disk drive is securely seated and is installed in the correct MSU slot. Refer to Chapter 5 for slot designations.
- 6 Replace the tape unit.
- 7 If the backup was unsuccessful, substitute a replacement tape drive or disk drive, and attempt the backup again.
Note: Verify that the full or partial backup was successful before system cutover.

User-reported problems

Procedure 14-15

Recover from user hears "Your mailbox is full ... your mailbox is empty" after a node is rebooted "mailbox full ... mailbox empty"

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.

- 1 Run the VS audit to correct the disk space usage information:
 - 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.

If it is possible to keep the node OutOfService after it is restarted, run the audit before bringing the node back into service. This will avoid the occurrence of this problem.

Note: Refer to *Meridian Mail System Administration Tools* (NTP 555-7001-305) for detailed instructions on running an audit.

Procedure 14-16

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

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

Note: Refer to *Meridian Mail System Administration Guide* (NTP 555-7001-301, 302, or 303).

Procedure 14-17

Message Waiting Indication is delayed

- 1 Ensure that the CSQI and CSQO prompts in the Meridian 1 configuration record are set to 25% of the Meridian 1 call registers.

See Chapter 9 of this manual for details. The Meridian 1 must be initialized after changing these prompts.

14-12 Troubleshooting operational problems

- 2 Check the AML (ISDN/AP). Refer to Chapter 9 of this manual for AML hardware setup, Chapter 11 for AML programming, and Chapter 17 for AML link maintenance commands.
- 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 the Tools level and verify all users receive MWI. Refer to *Meridian Mail System Administration Tools* (NTP 555-7001-305).
- 7 If an interrupted dial tone is used for MWI notification, ensure there are sufficient digitone receiver (DTR) resources on the *Meridian 1*.
Meridian 1 traffic reports can be used as a tool to verify insufficient DTR resources.

Procedure 14-18

Call Sender does not work for any calls

- 1 Confirm that the customer number in the "System General Options" screen (under General System Administration) matches the customer number on the *Meridian 1*.
If the number doesn't match, edit the customer number on Meridian Mail.
- 2 Verify that the sender DN is valid. Check any restrictions that may apply. See "Class of service administration" in your system administration guide.
- 3 Verify that the Meridian Mail ACD agents have Transfer (TRN) and Conference (A03) programmed on the correct keys (6 and 7, respectively).
Check configuration against Chapter 1 1 of this manual.
- 4 Verify that all Meridian Mail users have a Conference (A03 or A06) key programmed for their telephone sets.
- 5 Verify correct programming of the Meridian Mail Channel Allocation Table (CAT).
- 6 Verify that the Call Sender is a valid DN that can be called by the Meridian Mail agents.
 - a. Open the user's profile.
 - b. Move the cursor to the "Personal Verification Recorded" field.

- c. Press [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 Meridian 1 and Meridian Mail databases for dialing restrictions.

Procedure 14-19

Revert DN does not work

- 1 Verify that the Meridian Mail ACD agents have Transfer (TRN) programmed on key 6.
Check configuration against Chapter 1 1 of this manual.
- 2 Verify that a Night Call Forward (NCFW) DN has been programmed in the ACD queue for Meridian Mail.
- 3 Verify that the correct revert DN appears in the user mailbox profile.
Use the Modify User command to check the mailbox setup.
- 4 Verify that the user is correctly performing the custom revert feature. Refer to the *Meridian Mail User Guide*.
- 5 Verify that the Revert DN is a valid DN that can be called by the Meridian Mail agents.
 - a. Open the user's profile.
 - b. Move the cursor to the "Personal Verification Recorded" field.
 - c. Press [Voice] softkey.
 - d. When the system prompts you for the DN, enter the Revert DN under test.
 - e. If the call is unsuccessful, check Meridian 1 and Meridian Mail databases for dialing restrictions.

14-14 Troubleshooting operational problems

Chapter 15: Hardware maintenance

This section provides procedures for the following:

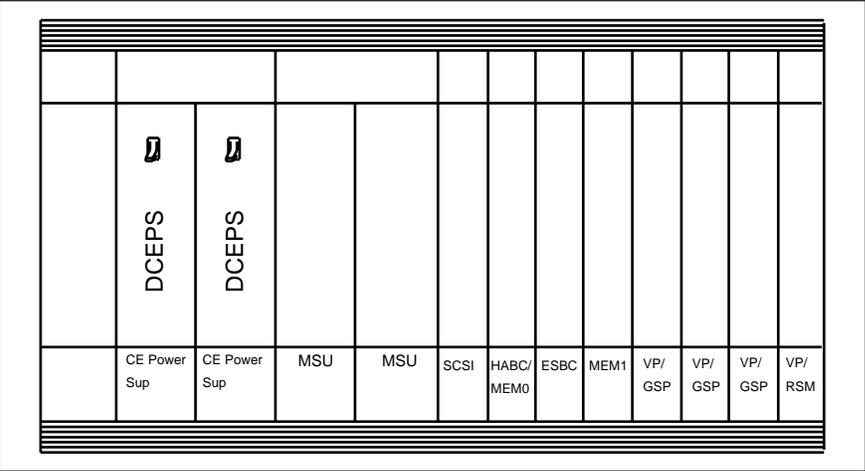
- power supply replacement
- printed circuit pack (PCP) replacement
- disk unit replacement
- enabling and disabling disk shadowing
- tape drive assembly replacement
- tape drive maintenance

**CAUTION****Risk of equipment damage**

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

Shut off the power to the Meridian Mail shelf using the circuit breakers (AC system) or the switches on the power supplies (DC system). See Figures 15-1 and 15-2.

Figure 15-2
Location of DCEPS - DC system



Procedure 15-1
Removing and replacing a power supply

See the handling precautions at the beginning of the chapter.

- 1 Power off the affected module.
- 2 Pull out the power supply 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 power supply switches.

Printed circuit packs

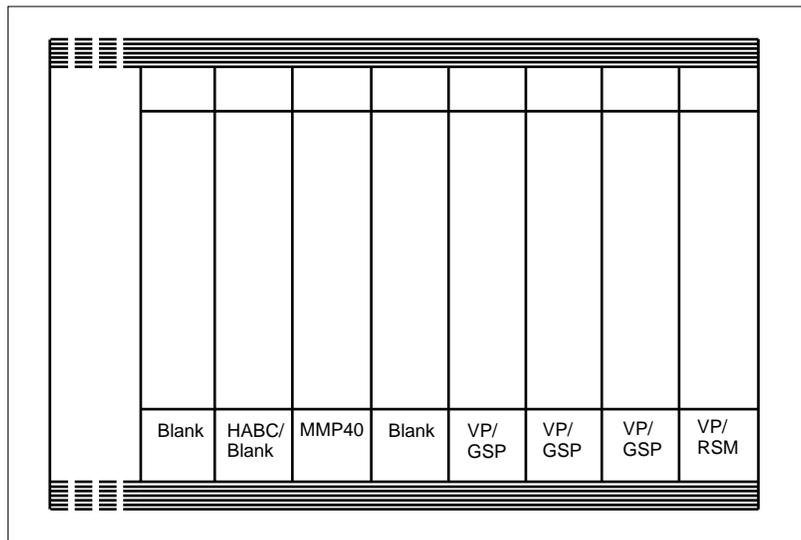
The following printed circuit packs PCPs are used in Meridian Mail:

- Meridian Mail Processor 68040 (MMP40) single board computer
- Network Voice Processor (NVP)
- High Availability Bus Controller (HABC) on prime node of systems with multiple nodes
- RS-232 Service Module (RSM)

Refer to Chapter 7 of this manual for switch and jumper locations and settings for the PCPs, and for an explanation of which packs belong in which slots.

The printed circuit pack slot positions are shown in Figure 15-3.

Figure 15-3
Printed circuit pack positions



Procedure 15-2
PCP removal and replacement

See the handling precautions at the beginning of the chapter.

- 1 Power off the affected module.
- 2 Disconnect cables attached to the fronts of packs as needed.
- 3 Use the card ejectors to remove each PCP to be replaced or checked.
The designation strip at the bottom rail of the shelf identifies the locations of each pack. Circuit pack locations depend on system size.
- 4 Verify the switch and jumper settings on the replacement PCP. See Chapter 7 of this manual for switch and jumper locations and settings for the PCPs.
- 5 Slide the replacement PCP into the correct slot and lock the ejectors.
- 6 Reconnect any cables you disconnected.

Disk or disk/tape units

Procedure 15-3

Replacing a disk unit in an unshadowed node

- 1 See the handling precautions at the beginning of the chapter.
- 2 Power off the affected module.
- 3 Remove the tape or disk/tape unit by opening the ejectors and then carefully sliding the unit out.
- 4 Ensure that the replacement unit has the same part number, including suffix, as the one on your packing slip.
- 5 Verify the jumper settings and placement or removal of terminators on the replacement disk drive (See Chapter 7 of this manual). If the disk being replaced is on the prime node, see Procedure 15-12, "Replacement of tape drive."
- 6 Carefully slide the replacement unit in, and lock the ejectors in place.

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

Procedure 15-4

Primary (left side) disk replacement

- 1 See the handling precautions at the beginning of the chapter.
- 2 Disable disk shadowing (See procedure 12-2, Enabling/Disabling disk shadowing).
- 3 Power off the affected module.
- 4 Ensure the new primary disk or disk/tape unit has the same part number, including suffix, as the one shown on the packing slip.
- 5 Verify the jumper settings and placement or removal of terminators on the replacement disk drive and/or tape drive (see Chapter 7 of this manual), *but* address the new primary disk as SCSI ID=0.
- 6 Install the unit in the prime disk location (the same MSU slot as the disk you are replacing) by carefully sliding the unit in and locking the ejectors in place.
- 7 Reboot the system.
- 8 Synchronize the disks. Refer to the *Meridian Mail System Administration Guide* (NTP 555-7001-301).

Procedure 15-5
Secondary disk replacement

- 1 Disable disk shadowing (See Procedure 12-2, Enabling/Disabling disk shadowing).
- 2 Power off the affected module.
- 3 Remove the disk unit by opening the ejectors and then carefully sliding the unit out.
- 4 Ensure the new disk unit has the same part number, including suffix, as the one shown on the packing slip.
- 5 Verify the jumper settings and removal of terminators on the replacement disk drive (see Chapter 7 of this manual).
- 6 If this is the prime node, see the "Replacement of tape drive" section later in this chapter for tape drive jumpers and terminators.
- 7 Install the disk in the same MSU slot as the disk you are replacing by carefully sliding the unit in and locking the ejectors in place.
- 8 Reboot the system.
- 9 Synchronize the disks. Refer to *System Administration Guide* (NTP 555-7001-30x).

Tape drive units

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

Northern Telecom will ship the customer the appropriate backup tape with the tape drive assembly. The following table lists some of the backup tapes.

Table 15-1
Tape media

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

**WARNING****Risk of data errors**

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

Tape drive maintenance

Preventive maintenance of the tape drive involves periodic cleaning (after every four to six hours of use). To ensure reliable tape drive performance, 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 on the monitor of the system administrator's terminal.
- When a stored tape is moved to an environment with a greatly different temperature, allow the tape to slowly reach room temperature before using it.
- Do not open the cartridge access door to touch the tape.

Cleaning the tape drive

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

The tape cartridge cavity should be cleaned

- after an initial pass with a new tape cartridge
- after eight hours of normal use
- whenever dust or debris is visible inside the cartridge cavity

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

- low pressure aerosol air
- tapehead cleaning fluid or reagent grade chemically-pure isopropyl alcohol
- tape drive cleaning kit including a tape drive cleaning cartridge OR tapehead cleaning pads, lint-free cotton swabs, or any industry-acceptable head-cleaning swabs, six inches or longer

Note: If you have a Tandberg tape drive, do not use Procedures 15-6 and 15-7 as they apply only to Archive tape drives.

The tape drive cleaning kits are listed in Table 15-2.

Table 15-2
Tape drive cleaning kits

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

Procedure 15-6
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 15-8.

- 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 15-2.
- 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.

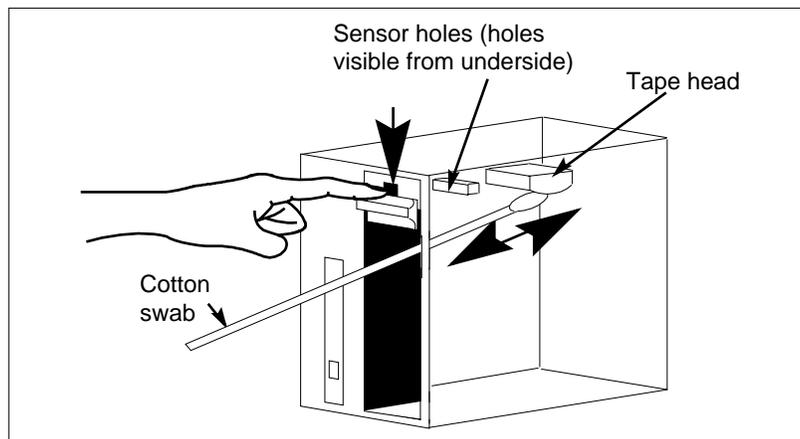
- 9 Remove the cleaning cartridge from the tape drive.
- 10 Remove the flexible pad by sliding it out of the holder. Discard the pad.
- 11 Insert a new, dry pad into the holder by sliding it into place.
- 12 Insert the cleaning cartridge into the tape drive and lock into place.
- 13 Move the dry pad using four strokes of the guide rod, moving the rod as far as it will go each time.
- 14 Remove the cleaning cartridge. Store it with the dry pad in its original carton until next use.

Procedure 15-7
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 15-8.

- 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 15-4.)

Figure 15-4
Archive tape drive cleaning



- 4 Moisten a pad or swab with the head-cleaning fluid until it is saturated but not dripping.
- 5 Carefully wipe the head in the direction that the tape travels. (Refer to Figure 15-4).



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 two minutes for the tape head to dry before inserting a tape.
- 9 Release the head loading lever away from the load position.
- 10 If there was a tape cartridge in the tape drive, reinsert it.

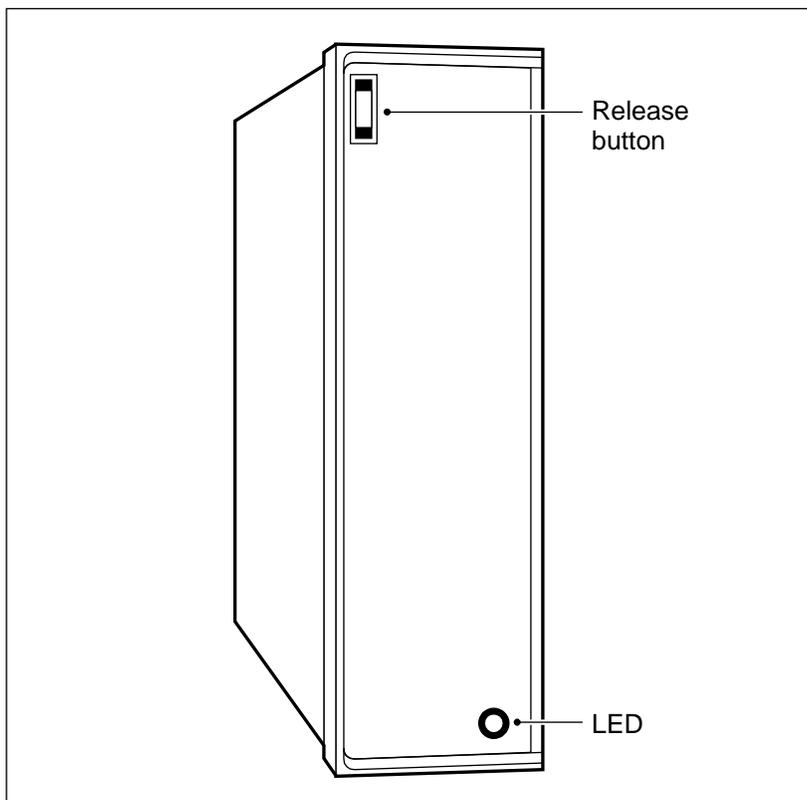
Procedure 15-8

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 15-6 or 15-7.

- 1 Press the release button on the tape drive (see Figure 15-5).
The tape drive door will spring open.
- 2 If there is a tape cartridge in the tape drive, remove the cartridge.
- 3 Prepare the cleaning cartridge as per the manufacturer's instructions.
- 4 Carefully blow out dust from the tape cartridge cavity with aerosol air.
- 5 Insert the cleaning cartridge into the tape drive.
- 6 Close the door to engage the cartridge.
The tape drive will start to spin.
- 7 After a suitable period (that is, several minutes), press the release button to disengage the cartridge.
The door will spring open and the tape drive will stop running.

Figure 15-5
Tandberg tape drive



- 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.

Installation of Mass Storage Unit

Procedure 15-9

Setting the SCSI ID for the Archive tape drive

- 1 Find the 3-by-6 header beside the SCSI connector. See Figure 15-7 and 15-8 for the header location.
- 2 Remove any jumpers on the header in positions A1 and A2. Insert a jumper on the header in position A0.
This sets the SCSI ID of the tape drive to 1.
- 3 Ensure that the Archive Viper tape drive terminator resistor packs are removed as indicated in the figure.
- 4 Verify the other jumpers as shown in Figures 15-7 and 15-8 .

Procedure 15-10

Setting the SCSI ID for the Tandberg tape drive

- 1 Find the 2-by-10 header beside the SCSI connector. See Figures 15-9 and 15-10 for the header location.
- 2 Insert jumpers on the header in position 0 and Parity as shown in the figure.
This sets the SCSI ID of the tape drive to 1.
- 3 Ensure that tape drive terminator resistor packs are removed.
- 4 Verify the other jumpers as shown in Figures 15-9 and 15-10.

Procedure 15-11

Installing a mass storage unit

- 1 Check the jumper settings are correct. Refer to Figures 15-7 to 15-10 appropriate.
- 2 Make sure no SCSI bus terminator is mounted on the tape drive. Refer to Figures 15-7 to 15-10 appropriate.
- 3 Slowly insert the MSU.
- 4 At the rear side, connect the SCSI interface cable with the red stripe in pin #1, and connect the harness cable into the power connector (12 V, 5 V, and ground) of the tape.

Note: There are two power harness cables. One is extra. Secure it for safety.

Note: A longer SCSI cable is included because the connector on the Archive Viper drive requires the longer SCSI cable in order to complete the installation. As the shorter version of the SCSI cable is shipped only for a brief period of time, you may not need to replace this.

- 5 Make sure the MSU is mounted securely. Tighten mounting and screws.
- 6 Insert power converter pack (QPC585).
Note: DC6150 and DC6250 tapes are recommended for backup. Keeping one type helps to reduce tape drive wear.

Replacement of tape drive

See the handling precautions at the beginning of the chapter.

Procedure 15-12 **Replacement of tape drive**

- 1 Power off the prime node.
- 2 Look on the replacement unit for the tape drive jumper settings, and ensure that they are configured as shown in Figures 15-7 to 15-10, as appropriate.
- 3 If the node is shadowed, see Procedure 15-4, "Primary (left side) disk replacement."
- 4 Install the new unit in the same MSU slot as the unit you are replacing by carefully sliding the unit in and locking the ejectors in place.
- 5 Reboot the system.

Figure 15-6
Mass storage unit (MSU) (NT4R28AC - Archive Viper tape drive)

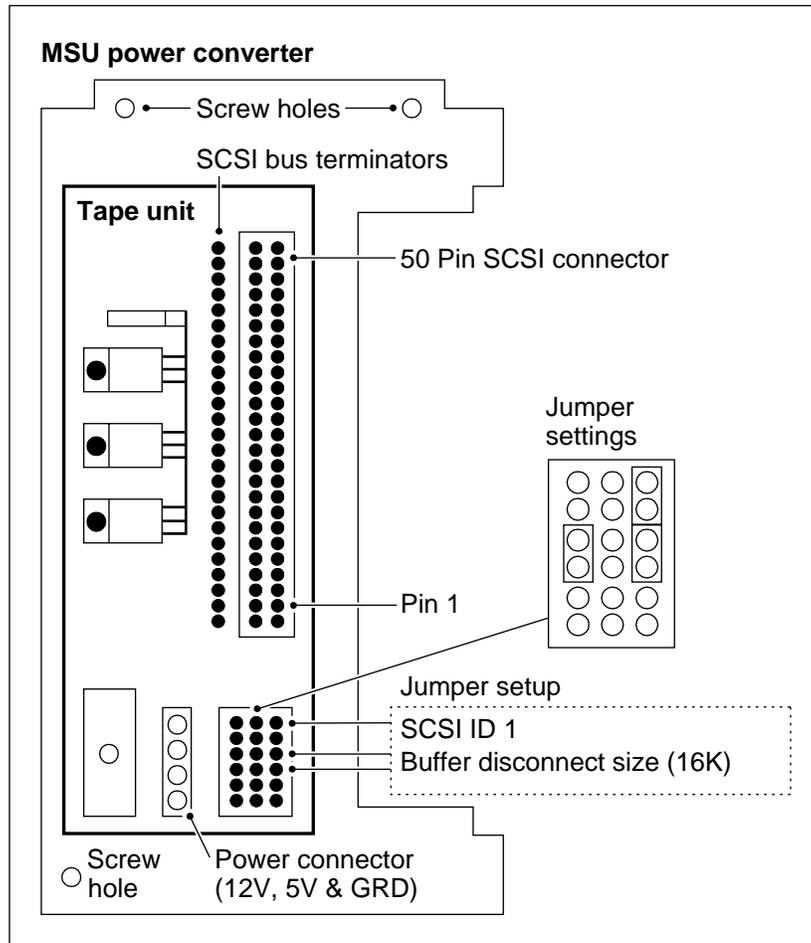


Figure 15-7
Archive Viper tape drive connectors and jumper settings

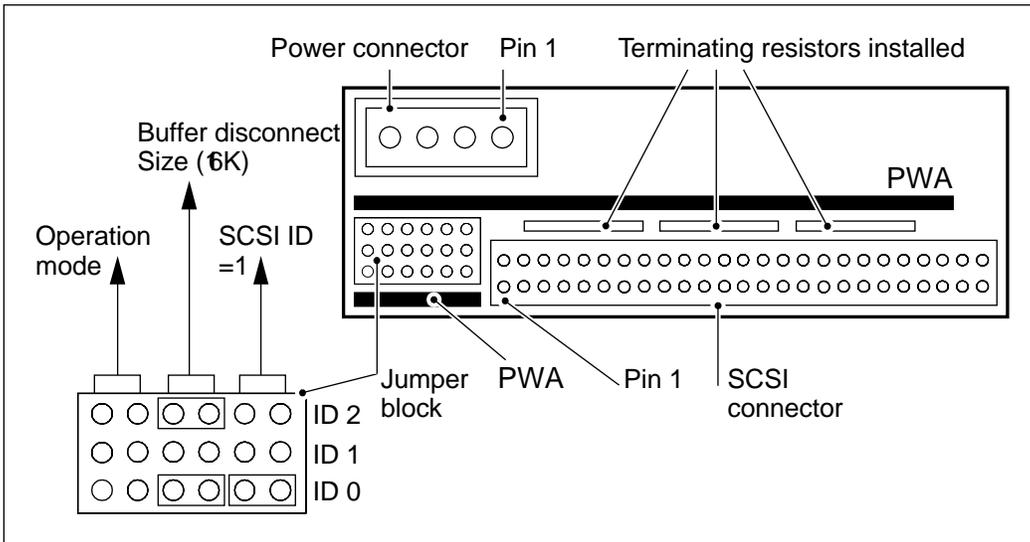


Figure 15-8
Rear of Archive Viper tape drive showing location of SCSI ID

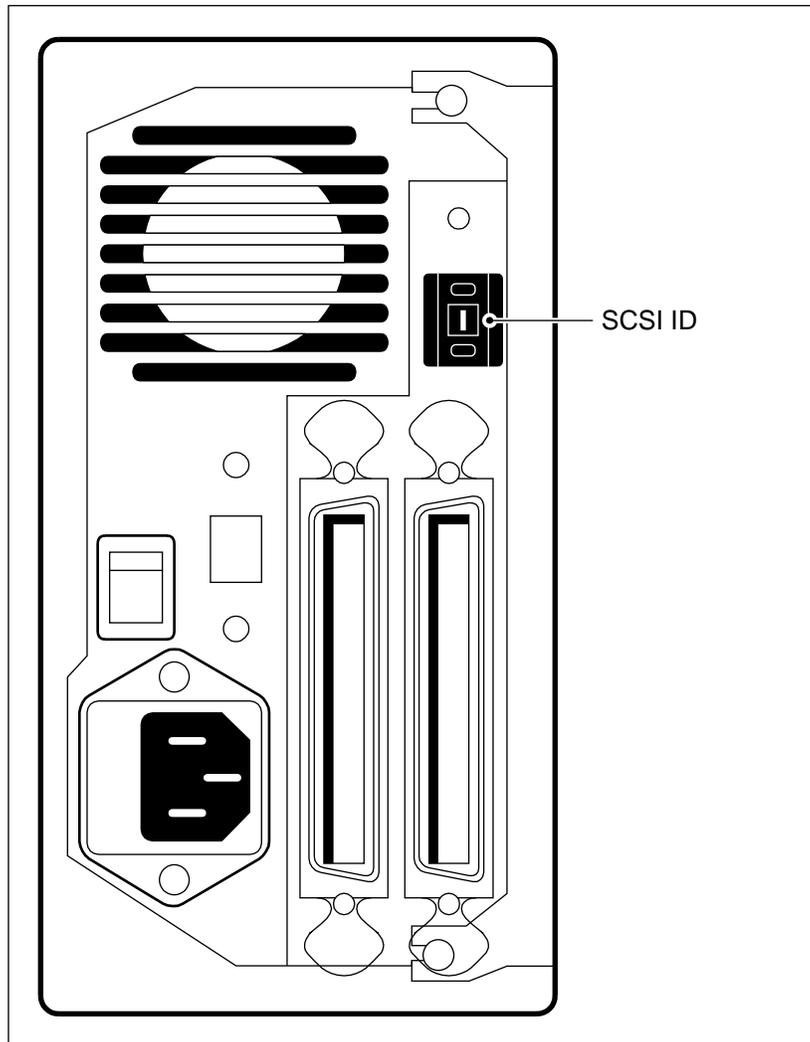


Figure 15-9
Tandberg tape drive connectors and jumper settings

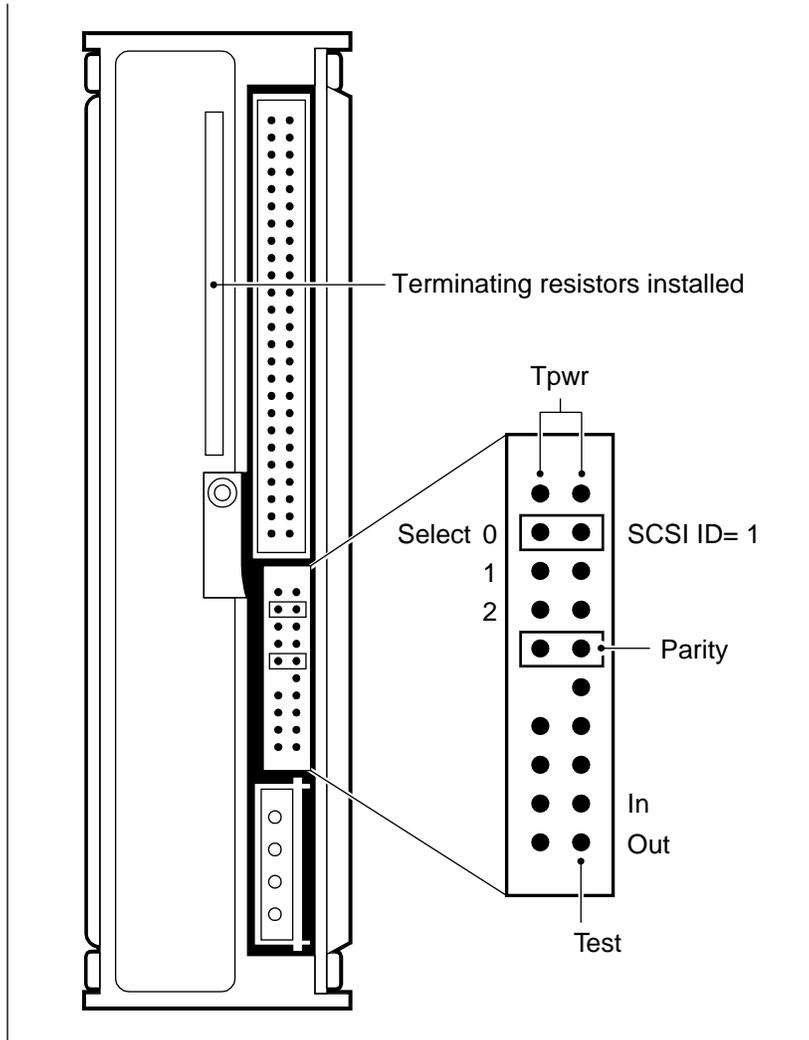
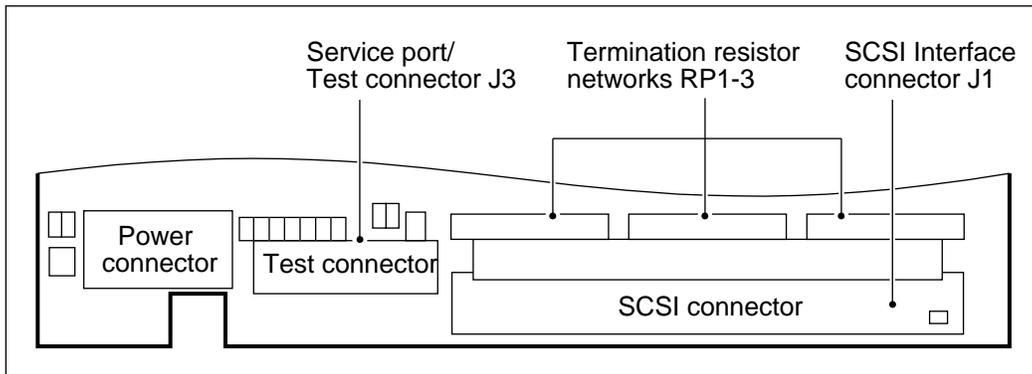


Figure 15-10
Tandberg tape drive connectors



Note: Terminator resistors are installed.

Chapter 16: Common disk subsystem problems

When checking the disk sub-system problems, the following diagnostic checklist should be followed:

- device jumpers
- bus cabling
- bus termination
- power
- SCSI device sanity test
- relevant SEER messages, especially Maintenance Actions, and SEERs of classes 11 to 14, 31, 66

Device jumpers

Jumpers are used to set the SCSI ID as well as a number of options on the disk and tape drives. The actual settings on these devices should be checked against the figures and descriptions in Chapter 7 of this manual.

Bus cabling

A SCSI bus runs from the card cage to the disk and tape drives. Check the following:

- Tape unit is securely seated in node 1
- Disk units are securely seated in each node
- SCSI pack is securely seated in each node.

- SCSI connector firmly connected to the backplane.
- SCSI connector is firmly connected to the front of the MMP40 card in each node.

Bus termination

There should be exactly one set of terminating resistors attached to the SCSI devices in a node on the disk drive which is installed in the left MSU slot. The resistor pack is plugged into the AMP socket on the SCSI cable in the MSU cage. All inboard terminating resistors must be removed from all the SCSI devices.

Power

Disk and tape drives are fed by one or more DC power converters and may behave erratically when there are power problems. Follow the procedures in the Meridian Mail power problems section in Chapter 13.

Note: Shadowed nodes require the installation of a load resistor P0710190. For installation details, refer to Chapter 5 of this manual.

SCSI sanity test

Perform a quick sanity check of the SCSI bus by testing tape and disk drives using Procedures 16-1 and 16-2.

Procedure 16-1

Tape drive sanity test

- 1 Power off the module that contains the tape drive.
- 2 Put a tape in the tape drive.
- 3 Power on the module.

The tape drive should make a series of clicking noises as it loads the tape. The message "TAPE RETENSION" appears on the administration terminal, followed by "CI to be loaded."

The System Installation & Modification menu returns.

Procedure 16-2

Disk drive sanity test

- 1 Power on each module.

As power is applied, the LED on each disk drive should come on briefly and go off. It should not remain continuously lit.

Disk problems identified by SEERs

Disk problems are reported by the disk manager in a Class 66 SEER. The complete list of these SEERs can be found in the *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510). The purpose of this section is to give further details of the most common ones.

A SEER in the form

```
6603/6605 node # disk #> sense key? # error code: # [block: #]
```

is produced when a disk reports a problem. The sense key describes the general nature of the problem and is standardized. The error code describes the exact problem but is often drive-dependent. There may be an optional disk block number associated with the problem report. Look for the following sense keys:

- *Sense key 2* indicates the disk is not ready to accept commands. One possible cause is that the drive is not spinning up. If this appears during regular operation, the disk should be replaced.
- *Sense key 3* normally indicates a medium error. Disk controller problems can also cause this sense key to come out. A block number is provided with this problem report, and the "scsi_pkg" verify command should be used to check that the block is indeed bad. The disk should be replaced.
- *Sense key 4* indicates a disk hardware failure.
- *Sense key 5* indicates an invalid command was sent to the drive. If this appears during regular operation, contact Nortel support.
- *Sense key 6* indicates the SCSI bus has been reset. If this appears during regular operation, contact Nortel support.

A SEER in the form

```
6604/6606 node # disk #> driver error #
```

is produced when there is a problem talking to a disk.

Driver error 129 indicates the disk cannot even be seen and is the most common. It is usually caused by incorrect SCSI ID jumpering on the drive itself or by a bad connection along the SCSI bus.

Procedure 16-3

Disk or disk/tape drive connection integrity test

- 1 Ensure that the disk or disk/tape drive is firmly seated.
- 2 Check the jumpers on the drive. See Chapter 15 for details.
- 3 Ensure that the SCSI cable and power cable from the drive to the drive cage connectors are firmly attached to both ends.

Data loss and disk replacement

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

Risk of data loss/corruption

When backing up a disk you think may have failed, 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 usually does not result in serious operational problems (for example, several corrupted messages or mailboxes) for Meridian Mail. However, damage to critical areas can cause a system malfunction.

Replace the disk and restore the backup onto the new disk. If the system malfunctions afterwards, restore the data from the most recent backup done prior to the disk failure.

Chapter 17: AML (ISDN/AP) link maintenance

Use the information in this section to maintain the following:

- AML (Application Module Link) for X11 Release 18.
- ISDN/AP protocol for X11 releases prior to 18
- Enhanced Serial Data Interface (ESDI) card on Meridian 1
- Multipurpose Serial Data Link (MSDL) card on Meridian 1

Meridian 1 releases prior to X11 Release 18 support the ESDI card and the ISDN/AP protocol. X11 Release 18 supports both the ESDI and the MSDL card. Release 18 also supports the AML protocol. In this section of the document, AML refers to both AML and ISDN/AP links. Previous releases of Meridian Mail also used the term Command and Status Link (CSL).

The particular AML in question is identified by the device number assigned by prompt ADAN in Overlay 17.

AML(ISDN/AP) link fault detection

The AML (ISDN/AP) consists of several hardware and software components. Failure of any of these components affects the operation of the link. When a faulty link is detected, the Meridian 1 puts the link in the "Down" state, and all calls are routed to the DN defined in the Night Call Forward (NCFW) field of the Main Meridian Mail ACD Queue. Communication between the Meridian 1 and Meridian Mail is lost until the link is restored.

17-2 AML (ISDN/AP) link maintenance

The following types of error messages are generated on the Meridian 1 maintenance TTY:

- CSA xxx AML(ISDN/AP) alarm messages
 - ESDA xxx and ESDI/MSDL xxx ESDI/MSDL failure messages
 - LNK xxx errors related to user commands in Overlay 48
- where xxx represents the error number and associated information

Check the status of the hardware by doing the following:

- Verify any SEER error messages that appear.
- Check cable connections between the ESDI/MSDL card and the Meridian Mail MMP40 card CSL (AML) connector on the I/O panel.
- Confirm bootROM messages that appear when Meridian Mail is powered on.
- Verify that the option plugs on the ESDI card are in the correct sockets; verify the switch settings on the MSDL card.
- Bypass intercabinet cabling by connecting a full 25-pin RS-232 cable between the ESDI/MSDL card and the 25-pin RS-232 connector on the Meridian Mail backplane (J3).
- Replace the ESDI/MSDL cable.
- Replace the ESDI/MSDL card.
- Replace the MMP40 card.
- Verify that the Meridian 1 has the correct ROM card(s).
- Verify that the Meridian 1 has the correct software options for the AML(ISDN/AP) application.

Link maintenance

Control of the AML (ISDN/AP) is the responsibility of the Meridian 1. There are two main forms of AML (ISDN/AP) maintenance: the Overlay 48 program and a link-resident maintenance program.

The Overlay 48 program processes maintenance or diagnostic commands, such as Enable and Disable, related to the link. Refer to the *SL-1 Input/Output Guide* (NTP 553-3001-400) for a complete description of Overlay 48 commands.

The AML (ISDN/AP)-resident maintenance program monitors and controls AML (ISDN/AP) operation. The program evaluates the condition of the link and takes the appropriate action (for example, enable, disable). These actions are based on information received from the following software components:

- ESDI/MSDL maintenance software
- AML (ISDN/AP) polling program
- AML (ISDN/AP) maintenance overlay program

Once the fault has been isolated, the faulty hardware component is replaced. The link can then be enabled by entering the automatic link setup command (ACMS) in Overlay 48.

Call and database recovery

Any of the following events may cause an interruption of the AML (ISDN/AP) messaging:

- Meridian Mail system reload
- Meridian 1 system initialization
- 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

17-4 AML (ISDN/AP) link maintenance

When any of these events occur, AML (ISDN/AP) messages indicating a change of call status may be lost. This may result in a conflict between the Meridian 1 and Meridian Mail regarding the status of a terminal or an established call. Once the failure has been recovered, a series of AML (ISDN/AP) messages 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 (ISDN/AP) link commands

The Application Module Link (AML) provides a connection to applications such as Meridian Mail. The AML is configured on an Enhanced Serial Data Interface (ESDI) or Multipurpose Serial Data Link (MSDL) card.

In X11 Release 18 and later, the CMS and ESDI commands are replaced by the AML commands shown in the following table:

Old Commands	New Commands
ENL ESDI n	ENL AML n LYR2
DIS ESDI n	DIS AML n LYR2
ENL CMS n	ENL AML n LYR7
DIS CMS n	DIS AML n LYR7
CON ESDI n	EST AML n LYR2
DSC ESDI n	RLS AML n LYR2
(ESDI card) ACMS n	ENL AML n ACMS
(MSDL card) ACMS n	ENL AML n AUTO
SLFT ESDI n	SLFT AML n
STAT CMS n	STAT AML n
STAT ESDI n	STAT AML n
SWCH CMS n n	SWCH AML n n

ACMS n-pre-release 18**ENL AML n ACMS (ESDI card)-Release 18 and later****ENL AML n AUTO (MSDL card)-Release 18 and later**

Setup the AML (ISDN/AP) automatically using the ESDI/MSDL port number n. The ESDI/MSDL port must first be in the Disabled state (DIS ESDI n or DIS AML n LYR2). This command is equivalent to entering the ENL ESDI n or ENL AML n LYR2, CON ESDI n or EST AML n LYR2, and ENL CMS n or ENL AML n LYR7 command sequence. If the first attempt to enable the link fails, the ACMS program keeps trying until setup is successful or you enter the DIS ESDI or DIS AML n LYR2 command. Every time the link setup fails, the system prints error messages.

ACMS is a background program and continues until the DIS ESDI or DIS AML n LYR2 command is entered, even if the overlay is aborted.

Note: To disable autorecovery of an MSDL card, use DIS AML n AUTO.

DIS CMS n-pre-release 18**DIS AML n LYR7-Release 18 and later**

Disable AML (ISDN/AP) port number n. This command does not disable the actual ESDI/MSDL port but disables application layer processing. A warning message is given when you attempt to disable the active AML (ISDN/AP), but the command will be accepted.

Note: Do not use this command while the port is performing a self test (SFLT) on the AML link.

ENL CMS n-pre-release 18**ENL AML n LYR7-Release 18 and later**

Enable AML (ISDN/AP) port number n. This command is successful only when the associated hardware components (ESDI/MSDL port) are enabled. The ESDI/MSDL port must be in the CONNECTED state (see CON ESDI or EST AML n and ACMS [Release 17], or ENL AML n ACMS or ENL AML n AUTO commands [Release 18]).

The Enable command triggers the sending of an AML (ISDN/AP) polling message to Meridian Mail. If the Meridian 1 receives the correct response, a positive response is printed on the TTY, and a polling message is sent every five seconds. If there is no response to the polling message, an error message is printed, and no more polling messages are sent.

AML(ISDN/AP) link and ESDI/MSDL diagnostics

Use the following commands to determine link status:

STAT CMS-pre-release 18

STAT AML-Release 18 and later

Display the status of all AML (ISDN/AP) links.

STAT CMS n-pre-release 18

STAT AML n-Release 18 and later

Display the status of the AML (ISDN/AP) link using ESDI/MSDL port n.

CON ESDI n-pre-release 18

EST AML n LYR2-Release 18 and later

Set up the Link Layer (LAPB protocol) for the AML (ISDN/AP) application on ESDI/MSDL port n, which is placed in the CONNECTED state. This command is valid only if the ESDI/MSDL port is ENABLED. To enable the AML (ISDN/AP) link, the ENL CMS or ENL AML n LYR7 command must also be entered.

DIS ESDI n-pre-release 18

DIS AML n LYR2-Release 18 and later

Disable ESDI/MSDL port N. The link layer is disconnected and the ESDI/MSDL will not respond to far-end requests for link initialization. A warning message will appear if an attempt is made to disable the active AML (ISDN/AP) link, but the link can be disabled if desired.

DSC ESDI n-pre-release 18

RLS AML n LYR2-Release 18 and later

Disconnect the link layer and place the port in the ENABLED state. This command is applicable only when the port is in the CONNECTED state.

ENL ESDI n-pre-release 18

ENL AML n LYR2-Release 18 and later

Enable ESDI/MSDL port number n. This command initiates a self test of the ESDI/MSDL port hardware. If the command is successful, the port is placed in the ENABLED state. The CON ESDI or EST AML n LYR2 and ENL CMS or ENL AML x LYR7 commands must be issued before the AML (ISDN/AP) link is fully operational. See also the ACMS command.

SLFT ESDI n-pre-release 18

SLFT AML n-Release 18 and later

Perform the self test on ESDI/MSDL port n. This command is valid only if the specified port is ENABLED and the other port on the ESDI/MSDL card is configured and DISABLED. (Before doing the self test, configure the ESDI port not being tested with the following values: IADR = 1 and RADR = 3 [ESDI only].)

STAT ESDI-pre-release 18

STAT AML n-Release 18 and later

Display the status of all ESDI/MSDL ports.

ESDI/AML states

An ESDI/AML port may be in one of the states shown in Table 17-1.

Table 17-1
ESDI/AML states

DISABLED	The ESDI/AML port has been disabled by the DIS ESDI/AML command.
ENABLED	The ESDI/AML port has been enabled, but the link layer has not been set up by the CON ESDI/AML command. The ESDI/AML port must be in the ENABLED state to perform the self test.
CONNECTED	The ESDI/AML link layer (LAPB protocol) is set up (see CON ESDI/AML command), and the port is ready to send and receive messages.
AUTO SET UP	The ESDI/AML is attempting to set up the LAPB layer for AML(ISDN/AP) applications. This state occurs during automatic recovery of the AML (ISDN/AP) link or while the ACMS command is in progress.

MSDL/AML states

Layer 2 and layer 7 states of an MSDL/AML port are reported separately by the STAT AML command.

Layer 2 may be disabled, released, or established. Layer 7 may be disabled or active. Refer to the *SL-1 Input/Output Guide* (NTP 553-3001-400) for a more complete description.

17-8 AML (ISDN/AP) link maintenance

The messages listed in Tables 17-2 and 17-3 include additional information where

n = AML (ISDN/AP) link number (See prompt ADAN in Overlay 17.)

t = the system time

x = the reason that the error code was issued

Only a partial list of errors (those applicable to Meridian Mail) is included here. For a complete list of possible error codes (including ESDI/MSDL and LNK codes), see NTP 553-2301-511.

Table 17-2
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 17-3
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: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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: <ol style="list-style-type: none"> 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.

17-10 AML (ISDN/AP) link maintenance

Appendix A: Terminal configuration

Several different models of administration terminal can be used with Meridian Mail. Chapter 10 shows how to cable these terminals to the printer and the A/B switchbox.

This appendix describes how to configure the following terminals for proper data communications with Meridian Mail:

- HP700/22 terminal (see Procedure 18-1)
- HP700/32 terminal (see Procedure 18-2)
- NT220 terminal (see Procedure 18-3)
- VT220 terminal (see Procedure 18-4)
- VT320 terminal (see Procedure 18-5)
- VT420 terminal (see Procedure 18-6)

Note: The VT420 has been discontinued by the manufacturer and is superseded by the VT520.

- VT520 terminal (see Procedure 18-7)

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.

Field types in terminal setup screens

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 such as clearing the display to take place. Unless instructed otherwise, you do not need to use action fields.

Note: The underscores do not appear on the terminal screen.

Parameter entry or selection fields are used to enter or select terminal parameter values.

Configuring HP700/22 and HP700/32 terminals

Procedure 18-1

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 18-1.

Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field
<Enter>	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 <Enter>.
- 5 Exit setup mode by pressing the <SETUP> key.

Figure 18-1
HP700/22 setup screens

General Setup			
	Clear Display Recall	Clear Communications Save Default	Reset Terminal 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	2400	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		

18-4 Terminal configuration

Figure 18-1
HP700/22 setup screens - continued

Keyboard Setup

Keyboard Language	North American	Data Processing Keys	NO
Keyclick	YES	Shift Lock	NO
Margin Bell	YES	Break	YES
Warning Bell	YES	Auto Repeat	YES

Answerback = Auto Answerback NO

Conceal Answerback Clear All Tabs Set 8 Column Tabs

T	T	T	T	T	T	T	T	T
---	---	---	---	---	---	---	---	---

1234567890123456789012345678901234567890123456789012345678901

23

T	T	T	T	T	T
---	---	---	---	---	---

4567890123456789012345678901234567890123456789012

Programmable Function Key Setup

Function Key	F6	<u>Clear Key</u>
Qualifier Key	Shift	<u>Clear All Keys</u>

Key Definition

Procedure 18-2**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 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 18-2.

Use the following keys to view and change setup values:

Key	Description
Up and down arrow	Move from field to field.
Left and right arrow	Scroll through possible values for a parameter. The values are displayed in a window at the bottom of the screen.
<Enter>	Cause the requested action to take place in an action field.
<NextScreen>	Move to next setup screen.
<PrevScreen>	Move to previous setup screen.

- 4 Save changes by pressing <F6-SaveMenu> on *each screen* on which you make changes you want to save.
- 5 Exit setup mode by pressing the <SETUP> key.

18-6 Terminal configuration

Figure 18-2
HP700/32 setup screens

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM
		Host Port	1			
		Background	Dark			
		Screen Saver	10 Min			
		Refresh Rate	72 Hz			
		Key Click	Yes			
		Keyboard	U.S.			
		Message Translations	English			
		Setup Translations	English			
		<u>Clear Display</u>				
		<u>Clear Comm</u>				
		ROM Revision	C1017-80004-2948			

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM
		Smooth Scroll	Jump	Display Width	80	
		Cursor Type	Blink Line	Display Width Allowed	80 or 132	
		Cursor	Off	Char Cell Height	16 Dots	
		2nd Message Line	On	Clr on Width Change	Yes	
		Message Line	On	Aux Mode	Off	
		Status Line	On	Aux To Host	No	
		On Line	Yes	Print Terminator = FF	No	
		Local Echo	Off	Logical Page Size	24	
		Auto Wrap	Off	Number of Pages	1	
		Auto Linefeed	Off			
		Display Ctrl Codes	Off			

Figure 18-2
HP700/32 setup screens - continued

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM
Emulation		VT320				
Terminal Id		VT220				
Control Codes		7-Bit				
Characters Mode		8-Bit				
Preferred Char Set		DEC Supplemental				
Keypad Mode		Application				
Cursor Keys		Normal				
Print Scroll Region		Off				
User Features Locked		No				
User Keys Locked		No				
Data Processing Keys		No				

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM
Communications		Full Duplex		CD		Ignore
Data Length		8-Bits		Break Duration		170ms
Parity		None		Disconnect Delay		Never
Stop Bits		1		Aux Printer Type		National
Xmit Baud		2400				
Recv Baud		=Xmit				
Xmit Pace		Xon/Xoff				
Recv Pace		Xoff at 128				
Limited Transmit		Off				
DSRI		No				
CTS		Ignore				

18-8 Terminal configuration

Figure 18-2
HP700/32 setup screens - continued

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM
Communications		Full Duplex				
Data Length		8-Bits				
Parity		None				
Stop Bits		1				
Xmit Baud		9600				
Recv Baud		=Xmit				
Xmit Pace		DSR/Xon/Xoff				
Recv Pace		Xoff at 128				
Limited Transmit		Off				
Break Duration		170ms				
Aux Printer Type		National				

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM
Lock Key		Caps Lock		Tab setting		
Kbd Lock Enable		Yes				
Save Tabs		Yes				
Auto Repeat		Yes				
Margin Bell		Yes				
Warning Bell		Yes				
Auto AnswerBack		Yes				
Answerback =						
Conceal Answerback		No				
<u>Clear all Tabs</u>						
<u>Set 8 Column Tabs</u>						

Configuring an NT220 terminal

Procedure 18-3

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 18-3.

Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values, or cause requested action to take place (depends on type of field),

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 <Enter>.
- 5 Exit setup mode by pressing the <SETUP> key.

Figure 18-3
NT220 setup screens

GENERAL SET-UP	
To Next Set-Up Screen	NT220 Mode, 7 Bit Controls
On Line	
Clear Display	User Defined Keys Unlocked
Clear Communications	User Features Unlocked
Reset Terminal	Application Keypad
Recall Saved Values	Normal Cursor Keys
Save Current Values	No New Line
Default Values	Set-Up = English
Refresh Rate = 60 Hz	North American Keyboard

Printer Comm. Set-Up	Host Comm. Set-Up
To Next Set-Up Screen	Transmit = 2400
Speed = 9600	Receive = Transmit
Normal Print Mode	XOFF at 64
8 Bits, No Parity	8 Bits, No Parity
1 Stop Bit	1 Stop Bit
Print Full Page	No Local Echo
Print National Only	EIA Port, Data Leads Only
No Terminator	Disconnect, 2 s Delay
Bidirectional Off	Limited Transmit

Figure 18-3
NT220 setup screens - continued

Display Set-Up	Keyboard Set-Up
To Next Set-Up Screen	Typewriter Keys
80 Columns	Caps Lock
Interpret Controls	Auto Repeat
Auto Wrap	Keyclick
Jump Scroll	Margin Bell
Light Text, Dark Screen	Warning Bell
Cursor	Break
Block Cursor Style	Multinational
Flip Off	DEL = DEL; Shift/DEL = BS

Answerback/Tab Set-Up	Enhance/Block Mode Set-Up
To Next Set-Up Screen	CRT Saver Enabled
No Auto Answerback	Clear Screen after Size Change
Not Concealed	Define Function Key
Answerback =	COMPOSE Key Enabled
	Transmit Line
Clear All Tabs	End Of Line Char = CR/CRLF
Set 8 Column Tabs	No End Of Block Char

Configuring VT220, VT320, VT420, and VT520 terminals

Note: The VT420 terminal has been discontinued by the manufacturer and is superseded by the VT520.

Procedure 18-4

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 18-4.

Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values, or cause requested action to take place (depends on type of field).

To move to another setup screen, select a screen from the top line of the *Setup Directory* screen and press <Enter>. To move to the next setup screen, select *To Next Set-Up* on any other setup screen.

- 4 Save changes by returning to the *Setup Directory* screen, moving the cursor to the *Save* field, and pressing <Enter>.
- 5 Exit setup mode by pressing the <SETUP> key.

Figure 18-4
VT220 setup screens

Set-Up Directory					
<u>Display</u>	<u>General</u>	<u>Comm</u>	<u>Printer</u>	<u>Keyboard</u>	<u>Tab</u>
On Line	<u>Clear Display</u>	<u>Clear Comm</u>	<u>Reset Terminal</u>	<u>Recall</u>	<u>Save</u>
Set-up=English	North American Keyboard		Default	<u>Exit</u>	

Display Set-Up					
<u>To Next Set-Up</u>	<u>To Directory</u>	80 Columns	Interpret Controls		
Auto Wrap	Jump Scroll	Light Text, Dark Screen			
Cursor	Block Cursor Style				

General Set-up					
<u>To Next Set-Up</u>	<u>To Directory</u>	VT200 Mode	7 Bit Controls		
User Defined Keys Unlocked	User Features Unlocked	Multinational			
Application Keypad	Normal Cursor Keys	No New Line			

Communications Set-Up					
<u>To Next Set-Up</u>	<u>To Directory</u>	Transmit=2400	Receive=Transmit		
Xoff at 128	8 Bits, No Parity	1 Stop Bit	No Local Echo		
EIA Port, Data Leads Only	Disconnect, 2 s Delay	Limited Transmit			

Printer Set-Up					
<u>To Next Screen</u>	<u>To Directory</u>	Speed=9600			
Normal Print Mode	7 Bits, Odd Parity	1 Stop Bit			
Print Full Page	Print National Only	No Terminator			

Keyboard Set-Up					
<u>To Next Set-Up</u>	<u>To Directory</u>	Typewriter Keys	Caps Lock		
Auto Repeat	Keyclick	Margin Bell	Warning Bell	Break	
No Auto Answerback	Answerback =	Not Concealed			

Procedure 18-5
Configuring a VT320 terminal

Note: The VT420 has been discontinued by the manufacturer and is superseded by the VT520.

- 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 18-5.

Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field.
<Enter>	Scroll through possible values, or cause requested action to take place (depends on type of field).

To move to another setup screen, select a screen from the top line of the *Setup Directory* screen and press <Enter>. To move to the next setup screen, select *To Next Set-Up* on any other setup screen.

- 4 Save changes by returning to the *Setup Directory* screen, moving the cursor to the *Save* field, and pressing <Enter>.
- 5 Exit setup mode by pressing the <SETUP> key.

Figure 18-5
VT320 setup screens

```

Set-Up Directory
Display      General      Comm      Printer      Keyboard      Tab
On Line      Clear Display      Clear Comm      Reset Terminal      Recall      Save
Set-up=English      North American Keyboard      Default      Exit

```

```

Display Set-Up
To Next Set-Up      To Directory      80 Columns      Interpret Controls
Auto Wrap      Jump Scroll      Light Text, Dark Screen
Cursor      Block Cursor Style      Indicator Status Display

```

```

General Set-up
To Next Set-Up      To Directory      VT300 Mode, 7 Bit Controls      VT220 ID
User Defined Keys Unlocked      User Features Unlocked      8-bit characters
Application Keypad      Normal Cursor Keys      No New Line
UPSS DEC Supplemental

```

```

Communications Set-Up
To Next Set-Up      To Directory      Transmit=2400      Receive=Transmit
Xoff at 128      8 Bits, No Parity      1 Stop Bit      No Local Echo
DEC 423, Data Leads Only      Disconnect, 2 s Delay      Limited Transmit
No Auto Answerback      Answerback =      Not Concealed

```

```

Printer Set-Up
To Next Set-Up      To Directory      Speed=9600      Printer to Host
Normal Print Mode      NO XOFF      8 Bits, No Parity      1 Stop Bit
Print Full Page      Print National Only      No Terminator

```

```

Keyboard Set-Up
To Next Set-Up      To Directory      Typewriter Keys      Caps Lock
Auto Repeat      Keyclick      Margin Bell      Warning Bell      Break
Compose      <X] Delete
, , and . . Keys      < > Key      ` ~ Key

```

Procedure 18-6

Configuring a VT420 terminal

Note: The VT420 has been discontinued by the manufacturer and is superseded by the VT520.

- 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 18-6.

Use the following keys to view and change setup values:

Key	Description
Arrow keys	Move from field to field.

To move to another setup screen, select a screen from the top line of the *Setup Directory* screen and press <Enter>. To move to the next setup screen, select *To Next Set-Up* on any other setup screen.

- 4 Save changes by returning to the *Setup Directory* screen, moving the cursor to the *Save* field, and pressing <Enter>.
- 5 Exit setup mode by pressing the <SETUP> key.

Figure 18-6
VT420 setup screens

Set-Up Directory					
<u>Global</u>	<u>Display</u>	<u>General</u>	<u>Comm</u>	<u>Printer</u>	<u>Keyboard</u>
<u>Clear Display</u>	<u>Clear Comm</u>	<u>Reset Session</u>	<u>Recall</u>	<u>Save</u>	<u>Tab</u>
Set-up = English	Canadian (English)	Keyboard	Default		
Enable Sessions	Disable Sessions	<u>Exit</u>	<u>Screen Align</u>		

Global Set-Up		
<u>To Next Set-Up</u>	<u>To Directory</u>	
On Line	Sessions on Comm1	CRT Saver
Comm1=RS-232	70Hz	Printer shared

Display Set-Up			
<u>To Next Set-Up</u>	<u>To Directory</u>	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			
<u>To Next Set-Up</u>	<u>To Directory</u>	VT400 Mode, 7 Bit	Controls
User Defined Keys	Unlocked	User Features	Unlocked
Application Keypad	Normal Cursor Keys	No New Line	
UPSS DEC Supplemental	VT220 ID		
When Available	Update		

Communications Set-Up			
<u>To Next Set-Up</u>	<u>To Directory</u>	Transmit=2400	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			
<u>To Next Set-Up</u>	<u>To Directory</u>	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			
<u>To Next Set-Up</u>	<u>To Directory</u>	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

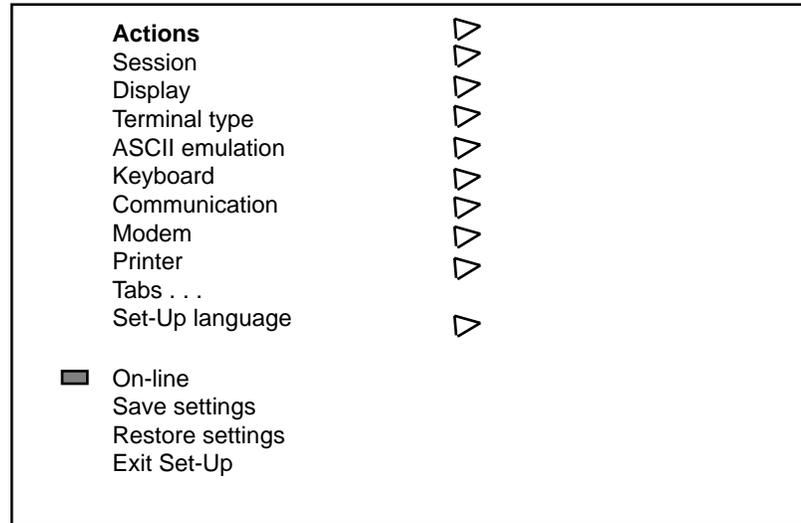
Procedure 18-7

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 18-7).

Figure 18-7
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 18-1
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 18-8 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 18-8
VT520 terminal - sample feature pop-up window

Actions	▷	Clear Display
Session	▷	Clear communications
Display	▷	Reset this session
Terminal type	▷	Restore factory defaults
ASCII emulation	▷	
Keyboard	▷	Clock
Communication	▷	Calculator
Modem	▷	Show character sets
Printer	▷	Banner message . . .
Tabs . . .	▷	
Set-Up language	▷	
■ On-line		
Save settings		
Restore settings		
Exit Set-Up		

Note: Features shown in parentheses are grayed out on the window.

18-20 Terminal configuration

- 5 Configure the terminal to match mandatory settings in Table 18-2. If no setting is specified, select the parameter which best suits your environment.
- 6 Press <SETUP> again to exit setup mode.

Table 18-2
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
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
-continued-		

Table 18-2
VT520 setup values - continued

Set-up Feature	First level	Mandatory setting or description
Display (continued)	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.
	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
-continued-		

18-22 Terminal configuration

Table 18-2
VT520 setup values - continued

Set-up feature	First level	Mandatory setting or description
Keyboard (continued)	(PC Keyboard language)	
	Define key . . .	Use Define Key Editor screen to set the following: F1=Hold Ignore Alt F2=Print ,< and .> Keys F3=Setup <> Key F4=Session '~ Key F5=Break
	Save key definitions	
	Recall key definitions	
	Lock key definitions	
	Caps lock function	Caps lock
	Keyclick volume	High
	Warning bell volume	High
	Margin bell volume	OFF
	Keyboard encoding	Character (ASCII)
	Auto Repeat	
	Data processing keys	
	Application cursor keys	
	Application keypad mode	
	(Map PC keyboard to VT)	
	Ignore missing keyboard	
Communication	Port select . . .	See Figure 18-9.
	Word size	8 bit
	Parity	None
	Stop bits	1 bit
	Transmit speed	2400 baud
	Receive speed	Transmit speed
-continued-		

Table 18-2
VT520 setup values - continued

Set-up Feature	First level	Mandatory setting or description
Communication (continued)	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 18-9.
	Print mode	Normal
	Printer type	DEC ANSI
	DEC/ISO char sets	Country dependent setting
	(PC character sets)	
	Print extent	Full page
	Print terminator	None
	Serial print speed	9600 baud
	2-way communication	XON/XOFF
-continued-		

18-24 Terminal configuration

Table 18-2
VT520 setup values - continued

Set-up Feature	First level	Mandatory setting or description
Printer (continued)	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 18-9
Port selection for VT520

S1	S2	S3	S4
Comm	Comm	Comm	Comm
<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/> Off	<input checked="" type="radio"/> Off
<input checked="" type="radio"/> com1	<input type="radio"/>		
<input type="radio"/>	<input checked="" type="radio"/> com2		
<input type="radio"/>	<input type="radio"/>		
Print	Print	Print	Print
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
<input checked="" type="radio"/> com3			

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.

Offsite 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 19-1 for terminals set at 9600 bps, or Table 19-2 for terminals set at 2400 bps.

Note: UDS modems can be configured manually using the front-panel buttons or through the administration terminal.

Table 19-1
Local modem setups for 9600 bps operations

Modem type	Configuration method	Refer to
UDS 2440	Front panel	Procedure 19-1
UDS 2440	Terminal	Procedure 19-2
Ven-Tel 2400-33/ 2400 Plus II	Terminal	Procedure 19-3
Ven-Tel 9600 Plus/ 9600 Plus II	Terminal	Procedure 19- 4

Table 19-2
Local modem setups for 2400 bps operations

Modem type	Configuration method	Refer to
Ven-Tel EC2400-33/ 2400 Plus II	Terminal	Procedure 19-6
Ven-Tel EC2400-33/ 2400 Plus II	Terminal	Procedure 19-10
UDS 2440	Terminal	Procedure 19-7
UDS 2440	Front panel	Procedure 19-8
UDS EC 224 A/D	Terminal	Procedure 19-9

Table 19-3
Remote modem setups for 2400 bps modems

Modem type	Refer to
Ven-Tel 2400-33/2400 Plus II	Procedure 19-10
UDS 2440	Procedure 19-11
UDS 224 A/D	Procedure 19-12

Table 19-4
Remote modem setups for 9600 bps modems

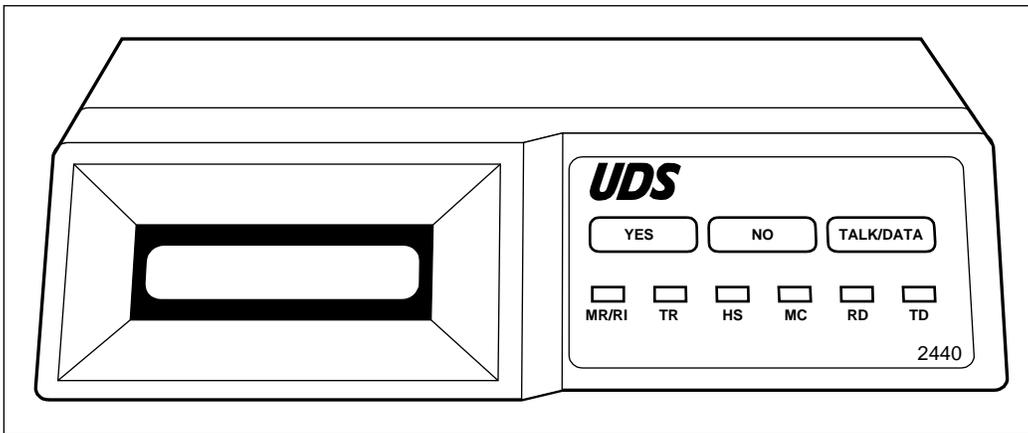
Modem type	Refer to
Ven-Tel 9600/9600 Plus II	Procedure 19-13

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 (see Figure 19-1).

Figure 19-1
UDS 2440 modem - front panel



Procedure 19-1
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 19-5 below.

Table 19-5
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 19-2
Configuring the UDS 2440 modem through the terminal

- 1 Enter the commands on Table 19-6 on the administration terminal to configure the modem.

Table 19-6
UDS 2440 modem configuration commands

Enter the following command	System response
<code>at&f3 <Return></code>	OK
<code>at&c1 <Return></code>	OK
<code>ats0=1 <Return></code>	OK
<code>at e0 s14=140 <Return></code>	No response is seen on the terminal after this command
<code>at&w <Return></code>	

Ven-Tel modems for 9600 bps operation

The Ven-Tel modems can be configured for 9600 bps operation through the administration terminal.

Procedure 19-3
Configuring the Ven-Tel 2400-33/2400 Plus II modem

- 1 Enter the commands on Table 19-7 on the administration terminal to configure the modem.

Table 19-7
Ven-Tel 2400-33/2400 Plus II modem configuration commands

Enter the following command	System response
<code>at&f <Return></code>	OK
<code>at&c1 <Return></code>	OK
<code>at&d0 <Return></code>	OK
<code>at\n3 <Return></code>	OK
<code>at\j0 <Return></code>	OK
<code>at\q1\l1 <Return></code>	OK
-continued-	

Table 19-7
Ven-Tel 2400-33/2400 Plus II modem configuration commands - continued

Enter the following command	System response
<code>ats0=1 <Return></code>	OK
<code>ats64=1 <Return></code>	OK
<code>at e0 s14=12 <Return></code>	No response is seen on the terminal after this command
<code>at&w <Return></code>	
-end-	

Procedure 19-4
Configuring the Ven-Tel 9600 Plus/9600 Plus II modem

- 1 Enter the commands on Table 19-8 on the administration terminal to configure the modem.

Table 19-8
Ven-Tel 9600 Plus/9600 Plus II modem configuration commands

Enter the following command	System response
<code>at&f <Return></code>	OK
<code>at&c1 <Return></code>	OK
<code>at\n3 <Return></code>	OK
<code>at\q0 <Return></code>	OK
<code>at%f2 <Return></code>	OK
<code>at\fo <Return></code>	OK
<code>ats0=1 <Return></code>	OK
<code>ate0 q1 <Return></code>	No response is seen on the terminal after this command
<code>at&w <Return></code>	

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 19-5

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 19-6

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 19-7

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 19-8

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 19-9 to configure the modem.

Table 19-9

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 19-9
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 19-9
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 19-9
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 19-9
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.

19-12 Configuration of modems for Remote Access

Table 19-10
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 19-10

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 ln3 &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 19-11

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 19-12

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 19-10.

Remote modem setups for 9600 bps modems

Procedure 19-13

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> .

19-14 Configuration of modems for Remote Access

- 3 Enter **at&f ln3 &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 1 configurations

Introduction to programming the Meridian 1 data link

This appendix explains how to select and program an appropriate value for the Meridian Mail AML link in the Meridian 1 configuration record.

Overview of the data link

Before selecting the required values for the link, it's helpful to understand the concept behind them. This will make programming the Meridian 1 easier.

When handling a telephone call, Meridian Mail receives information about the call from the Meridian 1. That is, Meridian Mail must know the number that was dialed, whether the call was internal or external, and so on. All this information is passed on by the switch (Meridian 1) to Meridian Mail through the *data link*.

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

Establishing the AML data link involves installing the hardware and programming the link in the Meridian 1 software by modifying the configuration record in LD 17.

Data link hardware requirements

The hardware required to establish the link is

- MSDL card or ESDI card which occupies a slot in a common equipment module of the Meridian 1
- cabling from the MSDL or ESDI card to the Meridian Mail backplane

The MSDL and ESDI cards are both I/O cards that serve as the interface from the Meridian 1 to Meridian Mail.

MSDL card

The MSDL card is a major enhancement over previous I/O cards in that it has four physical port connections but requires only *one* device number (DNUM) from the system. The device number identifies the ESDI port in all Meridian error and command messages. The range of device numbers is 0 to 15 inclusive.

ESDI card

The ESDI has two ports. Each port is assigned a device number (DNUM) (range 0-15) in Overlay 17. There are two important criteria to consider when determining and programming the DNUMs for the ESDI card:

- the two numbers must be consecutive.
- the two numbers must start with an even number.

The maximum possible devices on the Meridian 1 is 16. Therefore, the ESDI port device numbers are one of the following pairs:

0 and 1	4 and 5	8 and 9	12 and 13
2 and 3	6 and 7	10 and 11	14 and 15

The even number of the pair must be assigned to the J1 port of the ESDI card. The odd number is then assigned to the J2 port.

Programming the ESDI card

Device numbers are selected on the ESDI card by setting SW2. See Figure 20-1.

Table 20-1
Switch settings for device address (DNUM) on ESDI card

Device address (DNUM pair) (set to ADAN prompt in Overlay 17)	Setting for SW2 (0=ON; 1=OFF)
0-1	0 0 0 1
2-3	0 0 1 1
4-5	0 1 0 1
6-7	0 1 1 1
8-9	1 0 0 1
10-11	1 0 1 1
12-13	1 1 0 1
14-15	1 1 1 1

Data link software requirements

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 AML x link identifier assigned to the Meridian Mail AML link
- DNUM x device number for a port on the ESDI card
- VSID x Value Added 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. This is determined by reviewing the configuration record to see which numbers are already in use.

Reviewing the configuration record

The configuration record (CFN) is used to set all switch operation parameters. All the information you need to determine device numbers (DNUMs), AML, and VSID numbers is in this record. It is, therefore, important to print 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.

Table 20-3 is an excerpt from an Option 81 configuration record with explanatory notes in the right-hand column. The summary notes outline some key points to keep in mind when responding to the prompts in Overlay 17.

Summary considerations when programming in Overlay 17

- 1 There are 16 possible I/O device connections to the Meridian 1.
- 2 Each I/O device requires programming in Overlay 17 at the ADAN prompt. ADAN TTYs are system terminals, ADAN AMLs are application module links, and ADAN DCHs are D-channels. See Table 20-2.
- 3 Each AML must be associated with a VSID, but more than one AML can be associated with a single VSID.
- 4 *Device numbers* (DNUMs) are associated with each physical card and *cannot* be duplicated among device types. *AML and VSID numbers* are logical numbers and *can* be duplicated between device types.
- 5 System terminals/TTYs require any type of SDI card or even numbered port on a DCHI card.
- 6 D-channels require a DCHI card in the Meridian 1 (odd-numbered port only) or an MSDL card (any port).
- 7 AMLs require an MSDL or ESDI card.
- 8 Option 81 switch needs two I/O devices (TTYs) to be programmed on the Call Processor cards in its cores. The device numbers are for both cores. These allow access to the cores from the backplane for maintenance purposes. The active core has access to these ports. Port 0 is for a modem, Port 1 is for a TTY. These ports are in addition to the system terminal.

- 9 Each TTY number is a logical number and uses the same number as a device type. For example, TTY1 can only be assigned a DNUM of 1. In addition to the administration terminal normally programmed on device numbers 0 and 1 (as TTYs 0 and 1 in the configuration table), the Option 81 switch also requires two additional ports/device numbers from the possible 16 ports allowed.

When printing out an Option 81 configuration table in LD 22, these two ports will be programmed as ADAN TTYs on card type CPSI and will not indicate a DNUM in their programming (see Table 20-3). Even though the DNUM is not listed in the programming as associated with the TTY, these ports/devices always take the same device number as the TTY number. Therefore, each time you see an ADAN TTY programmed in the configuration record, you know that its corresponding device number, whether it appears in the programming or not, is going to be the same as the TTY number assigned.

- 10 The ESDI card is physically addressed by a switch block on the card (SW2).
- 11 You may want to reorganize/renumber the devices in the CFN. If you want to omit an AML number without omitting its associated programming (Overlay 23), build another AML (assign it a new number), and associate it with the same VSID as the AML you want to omit. Then, the system will allow you to omit the original one without deleting Overlay 23 programming which associates the ACD queue with the VSID.

20-6 Meridian 1 configurations

Table 20-2
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					

Table 20-3
Example of a configuration record showing DNUM, AML and VSID numbers

<pre> . . . (A) ADAN TTY 0 CTYP SD12 GRP 0 (B) DNUM 0 FLOW NO USER MTC TRF SCH XSM NO (A) ADAN TTY 1 CTYP SD12 GRP 0 (B) DNUM 1 FLOW NO USER MTC TRF SCH XSM NO (A) ADAN TTY 2 CTYP CPSI PORT 0 BPS 9600 PRTY NONE STOP 1 BITL 8 FLOW NO USER MTC TRF SCH BUG XSM NO A) ADAN TTY 3 CTYP CPSI PORT 1 BPS 9600 PRTY NONE STOP 1 BITL 8 FLOW NO USER MTC TRF SCH BUG XSM NO </pre>	<pre> (A, C, F) ADAN AML 6 CTYP ESDI GRP 0 (B) DNUM 6 DES MODMAIL BPS 4800 CLOK EXT IADR 003 RADR 001 T1 04 T2 010 T3 010 N1 128 N2 08 K 7 RXMT 05 CRC 10 ORUR 005 ABOR 005 (A) ADAN DCH 4 CTYP DCHI GRP 0 (B) DNUM 5 DES PRI USER PRI DCHL 2 OTBF 32 DRAT 64KC CLOK EXT IFC SL1 SIDE NET RLS ID 18 T23 20 T200 3 T203 10 N200 3 N201 260 K7 </pre>	<pre> (G) VSID 06 DLOP AML 06 SECU NO INTL 0001 MCNT 9999 CONF DIR . . . </pre> <p>Notes:</p> <p>(A) There are 6 I/O devices programmed in this configuration record.</p> <p>(B) There are 4 device numbers (DNUMS) taken (0&1; 2&3; 4&5; 6&7).</p> <p>(C) The Meridian Mail data link is programmed as an ADAN AML. Its AML is 6 and its DNUM is 6.</p> <p>(D) From this configuration, the DNUMS available to assign to a new I/O card are 8&9, 10&11, 12 & 113, 14&15.</p> <p>(E) DNUM 5 is NOT available because each DCHI card (as well as the ESDI card) captures a pair of ports whether assigned in the software or not.</p> <p>(F) Notice the ADAN AML programming. The card type (CTYP) is ESDI. (It could be MSDL if this system uses this type of I/O card). The DNUM is 6. All other prompts following ADAN AML 6 represent the parameters set for the Meridian Mail data link.</p> <p>(G) Notice the VSID prompt which follows the ADAN AML 6 programming. Each Meridian Mail data link (AML) requires that a VSID be assigned to it. The VSID programming here associates ADAN AML 6 and DNUM 6 with VSID 6. Remember each DNUM is unique. However, AMLS and VSIDs are logical numbers and therefore can be the same. For example, you can have both an AML 6, a TTY6, and a DCH 6, but they must all have different DNUMS assigned.</p> <p>(H) If possible, make all three numbers for each data link the same if existing programming will allow it.</p>
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20-8 Meridian 1 configurations

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.

Figure 21-1
MMP40 Troubleshooting Flowcharts

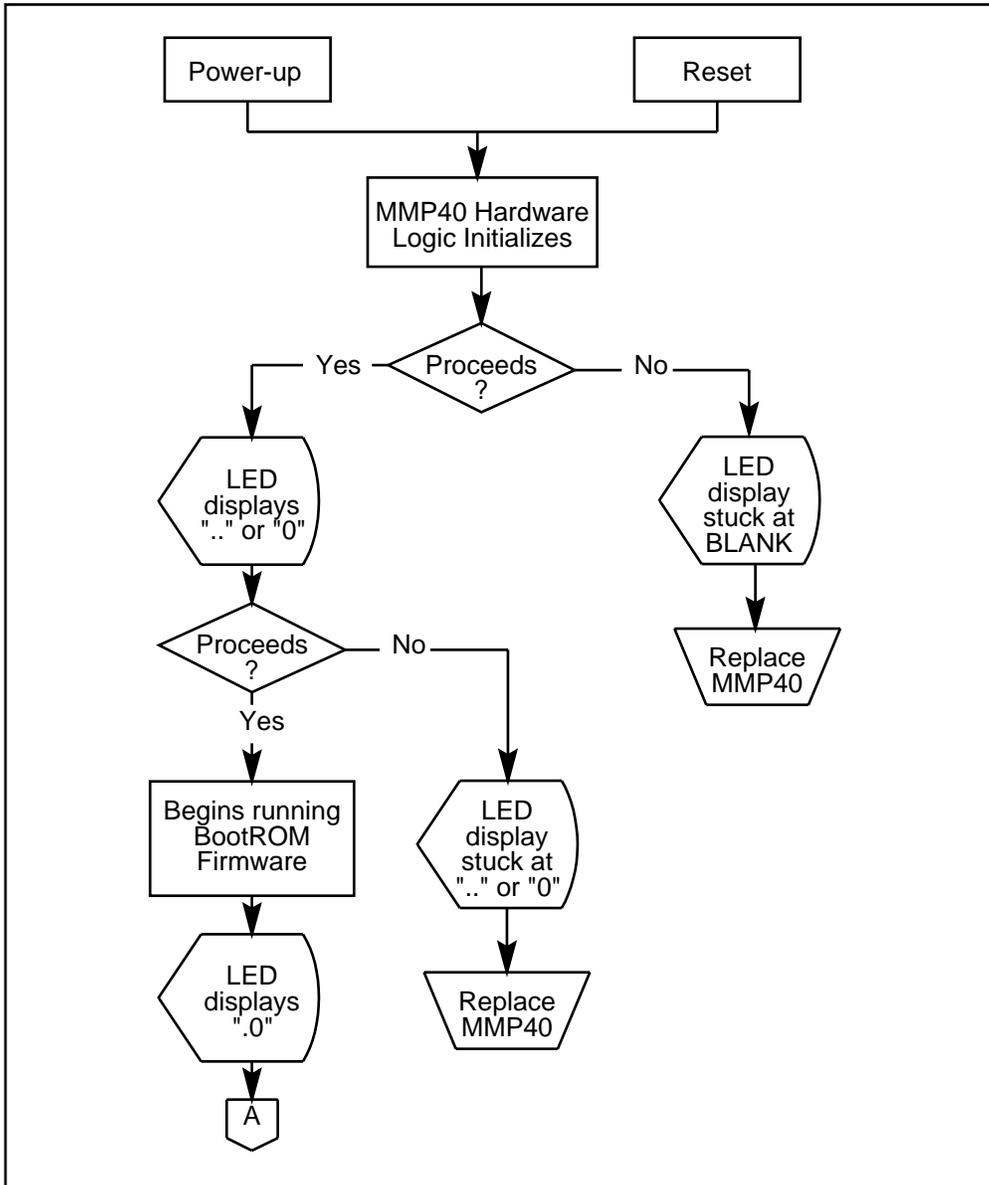


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

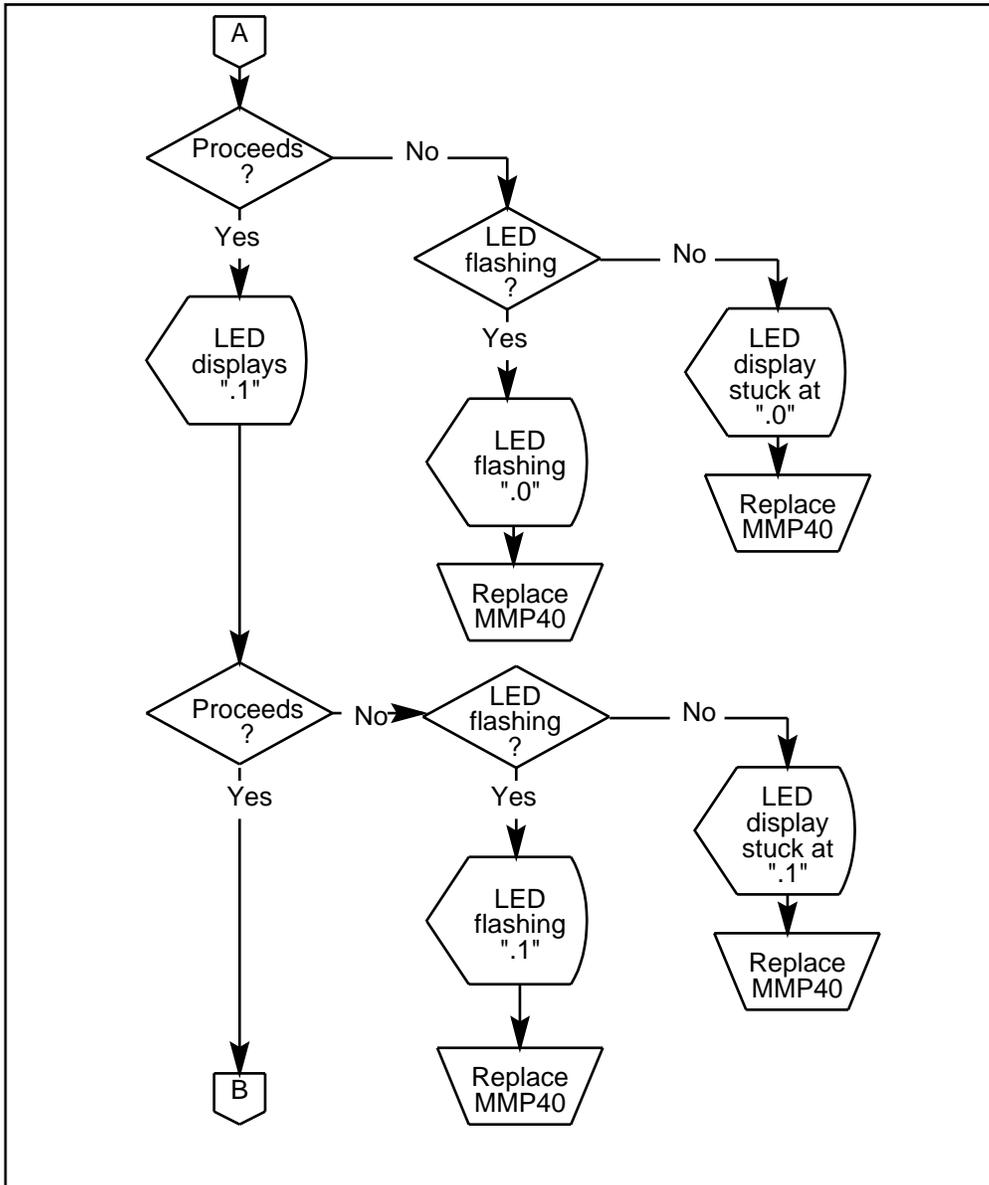


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

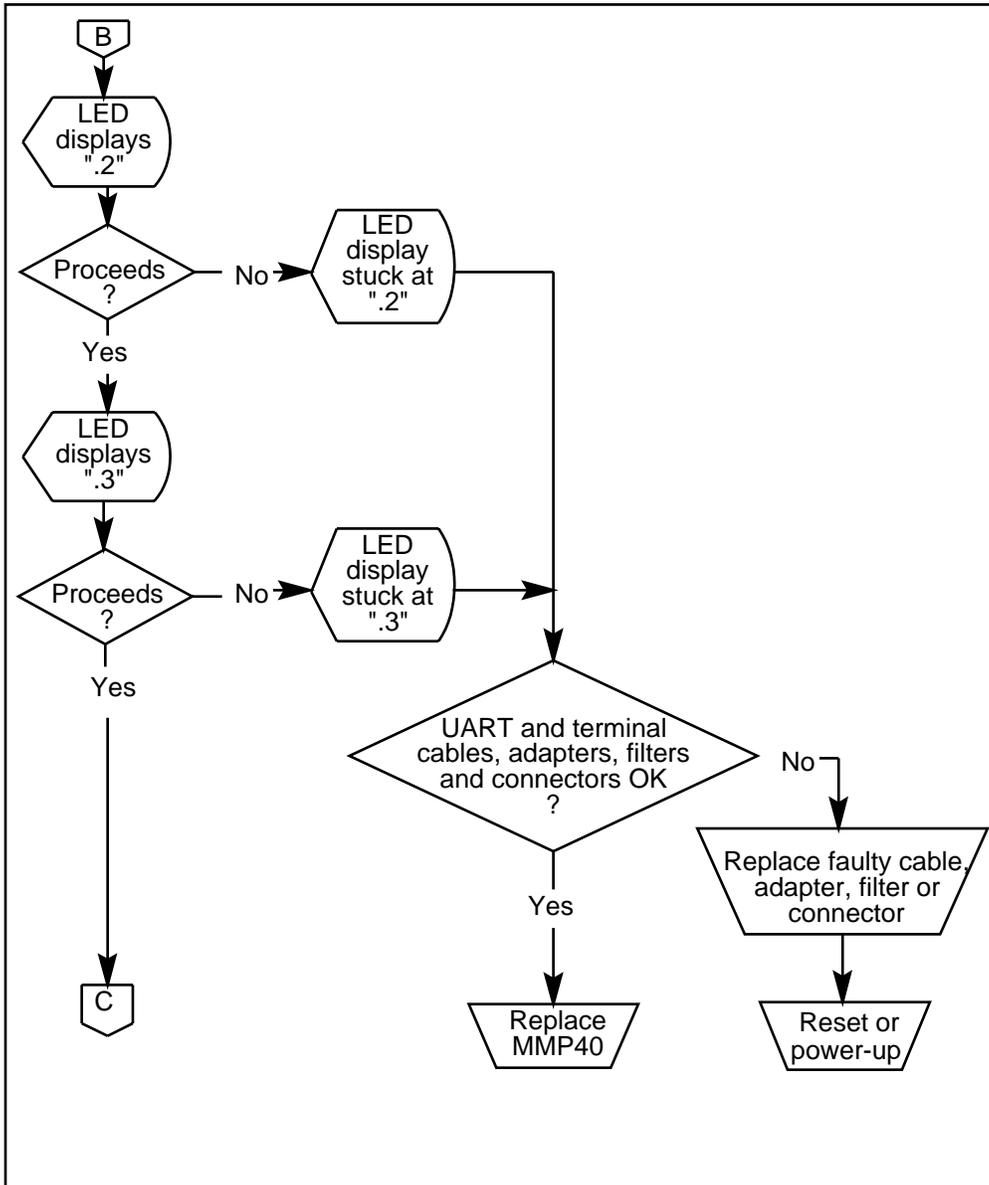


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

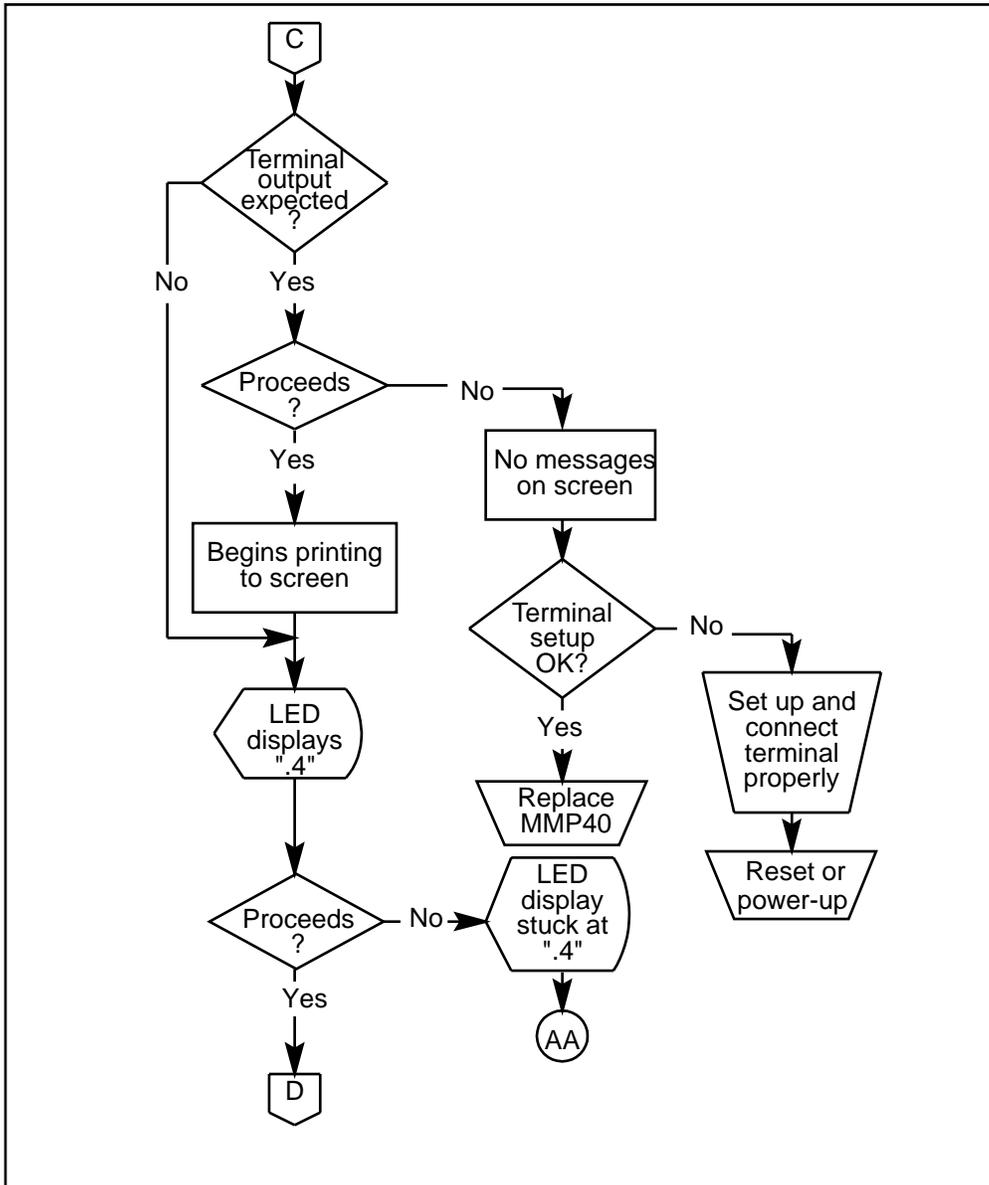


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

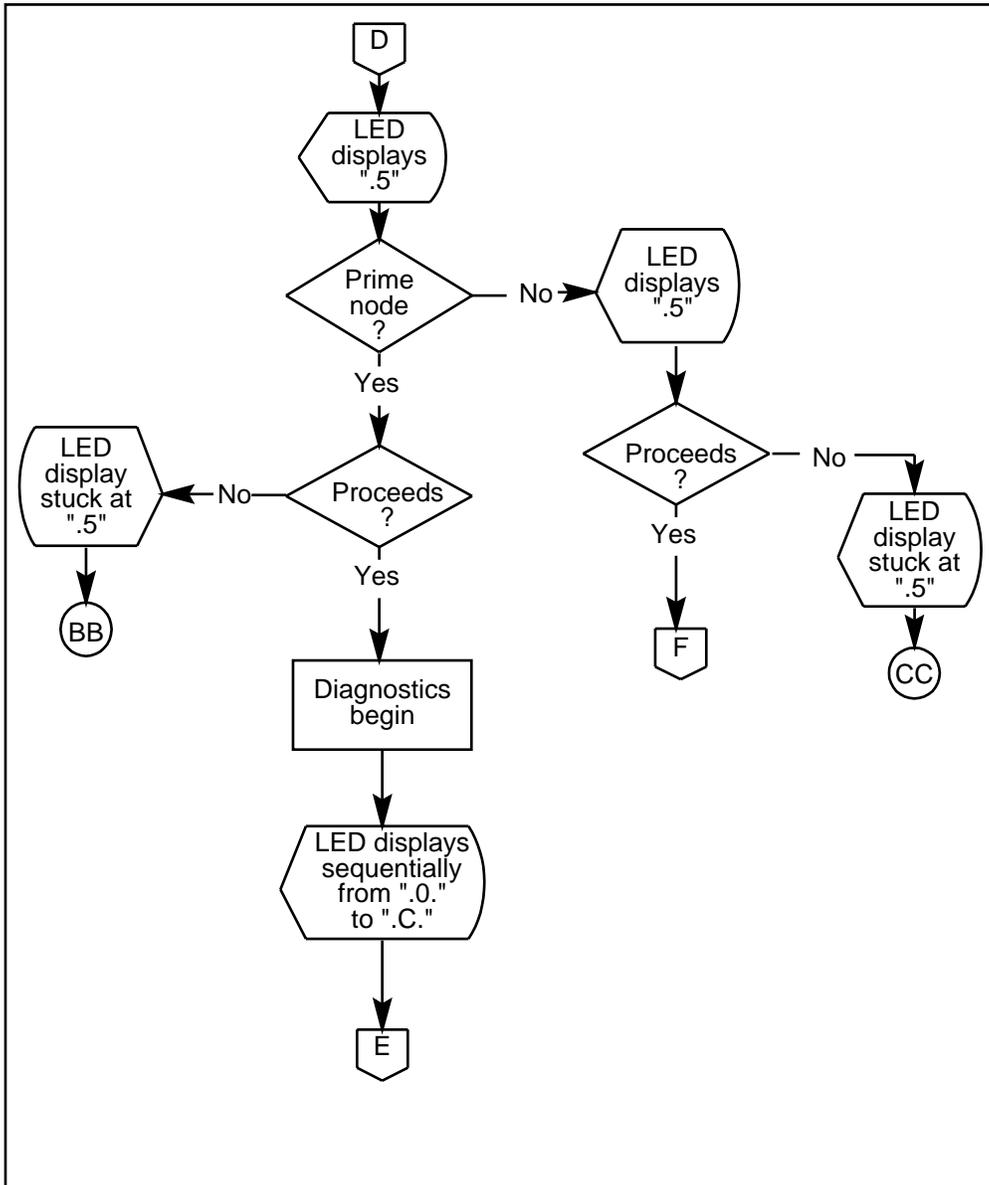


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

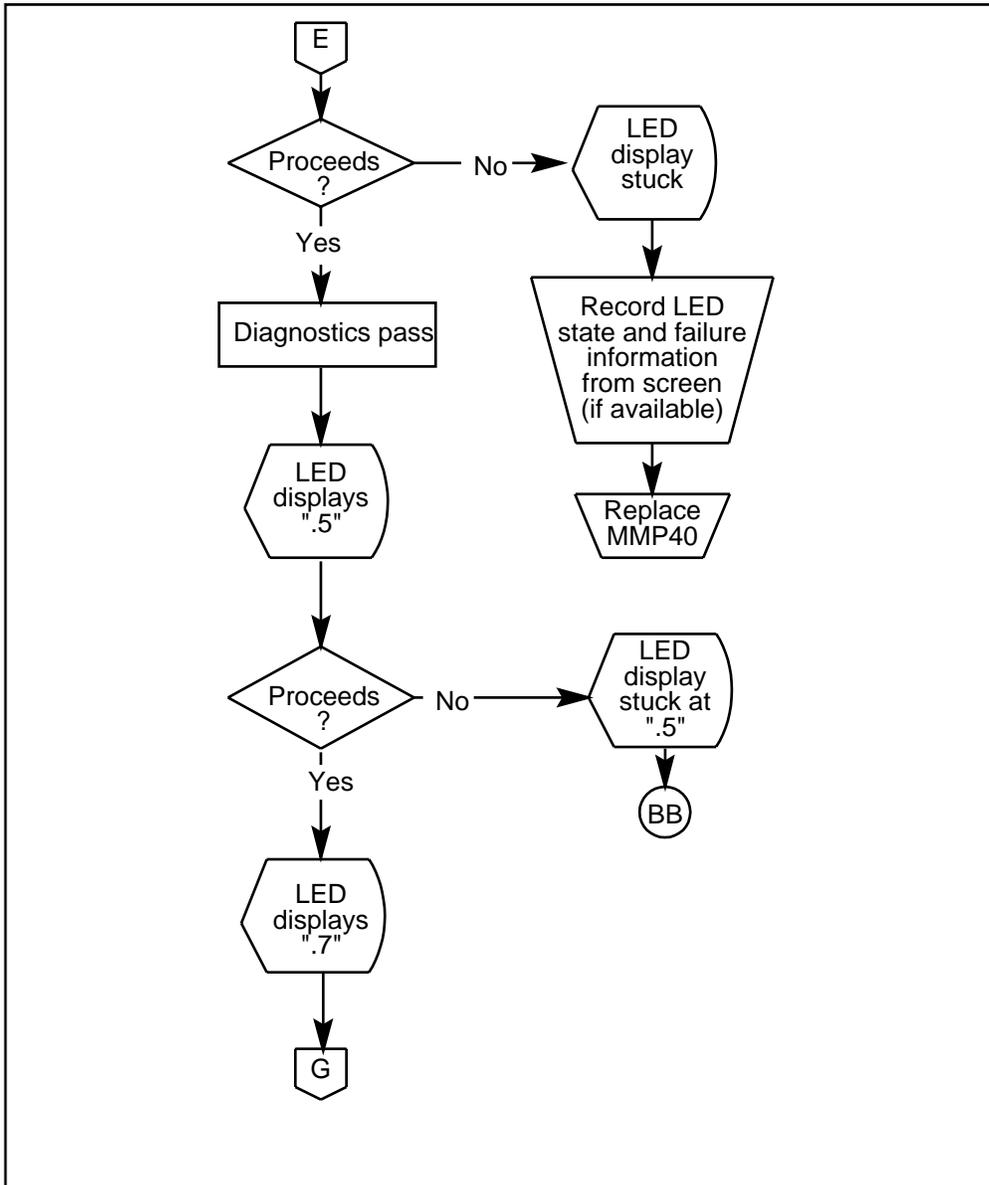


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

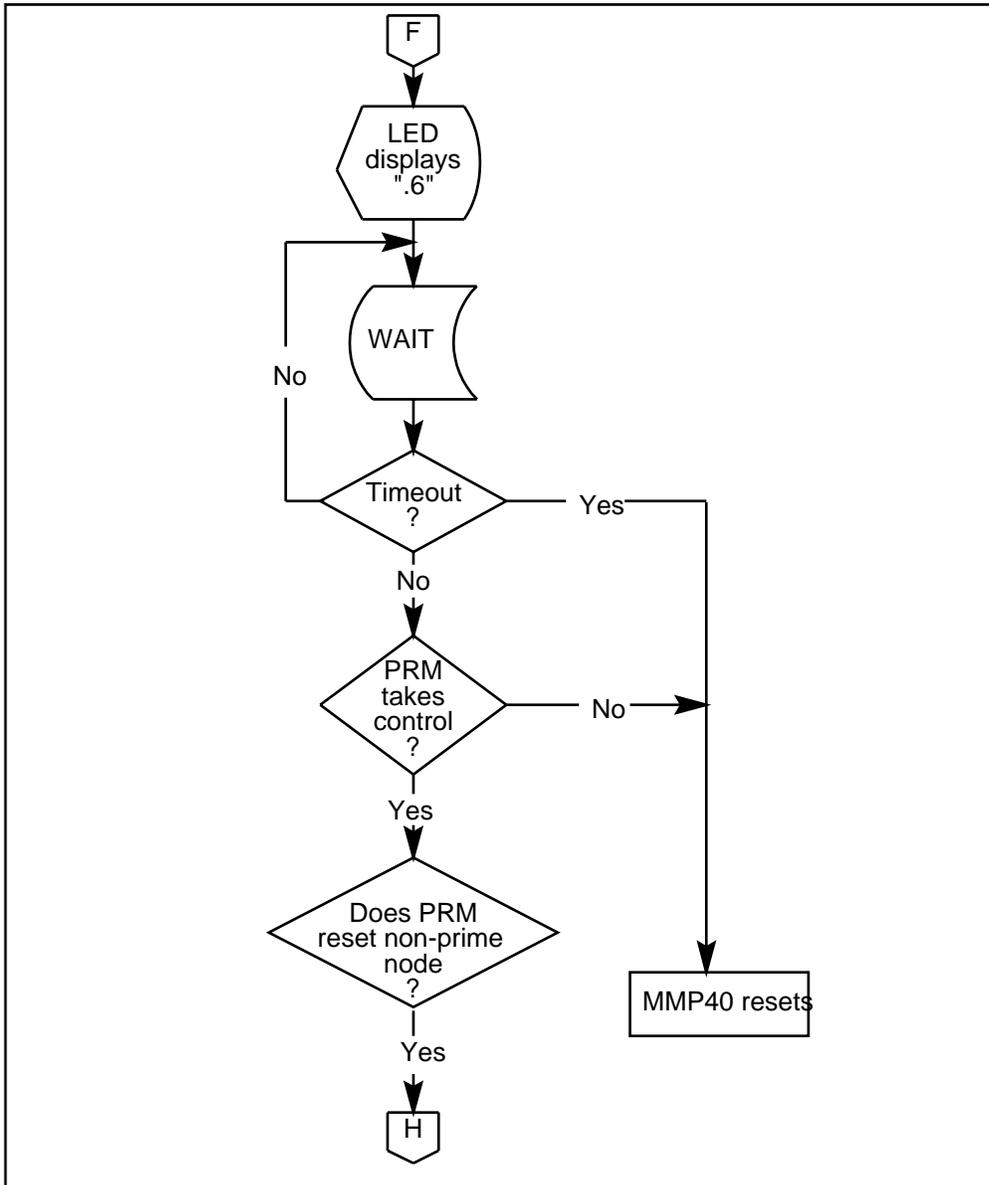


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

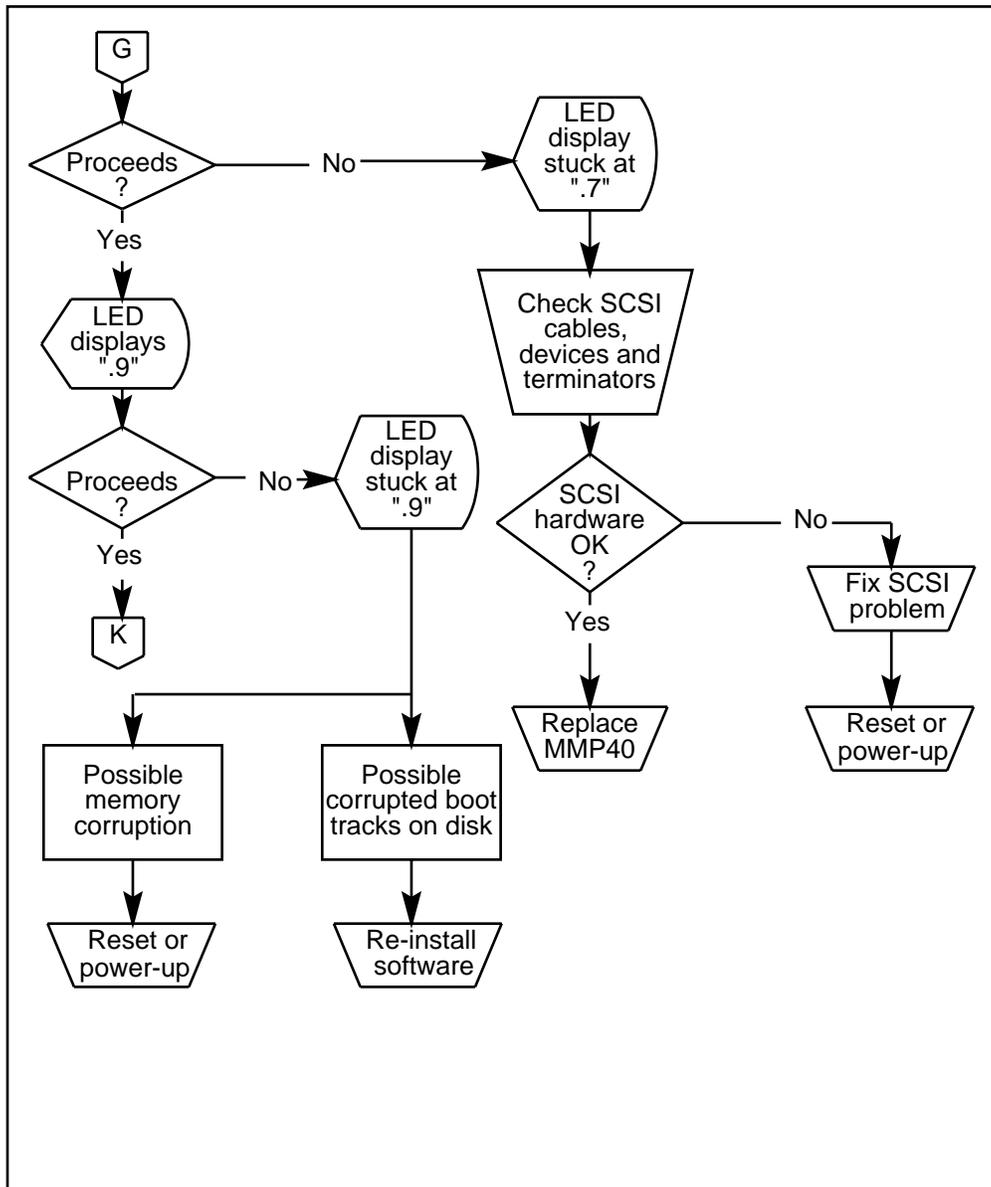


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

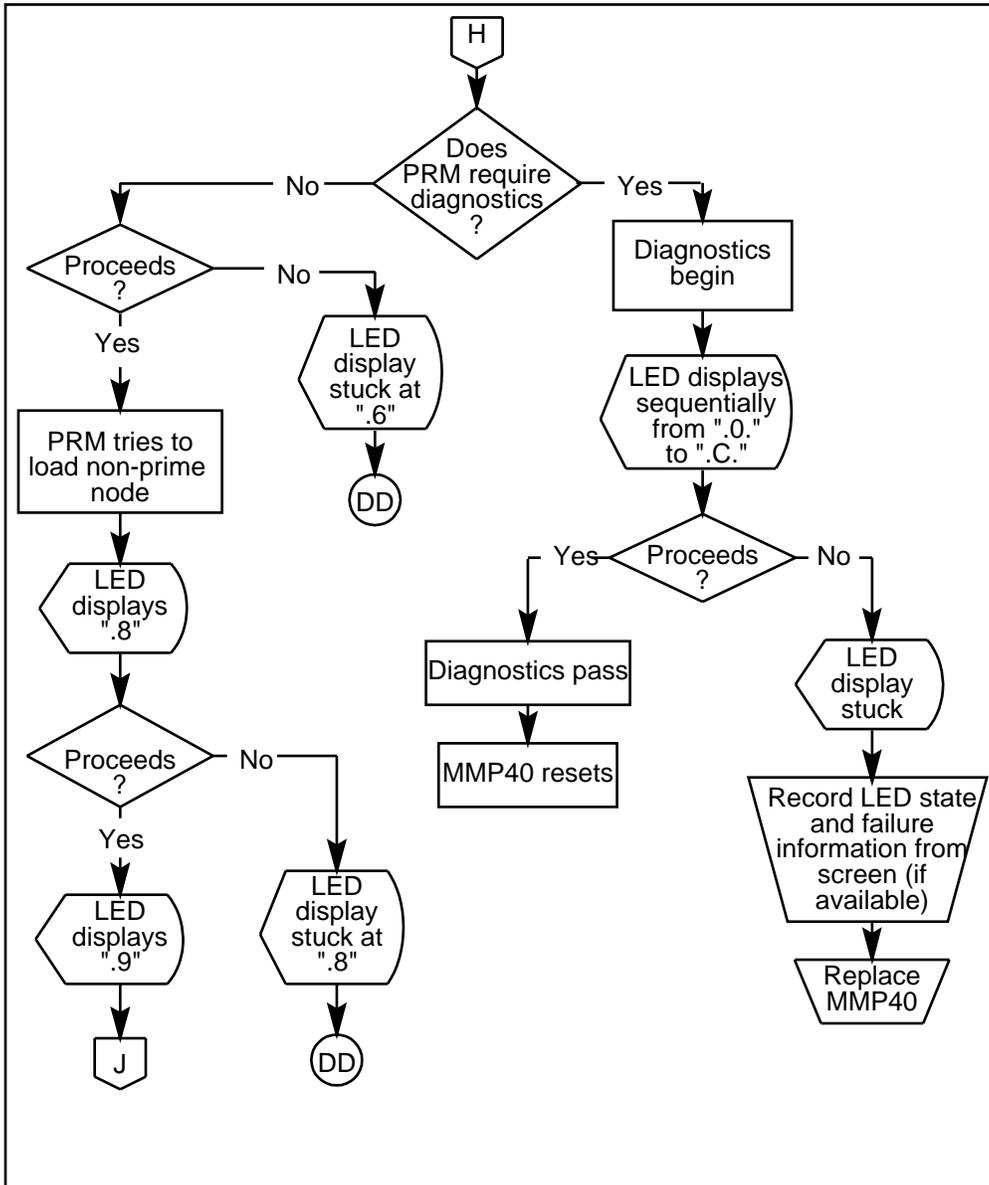


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

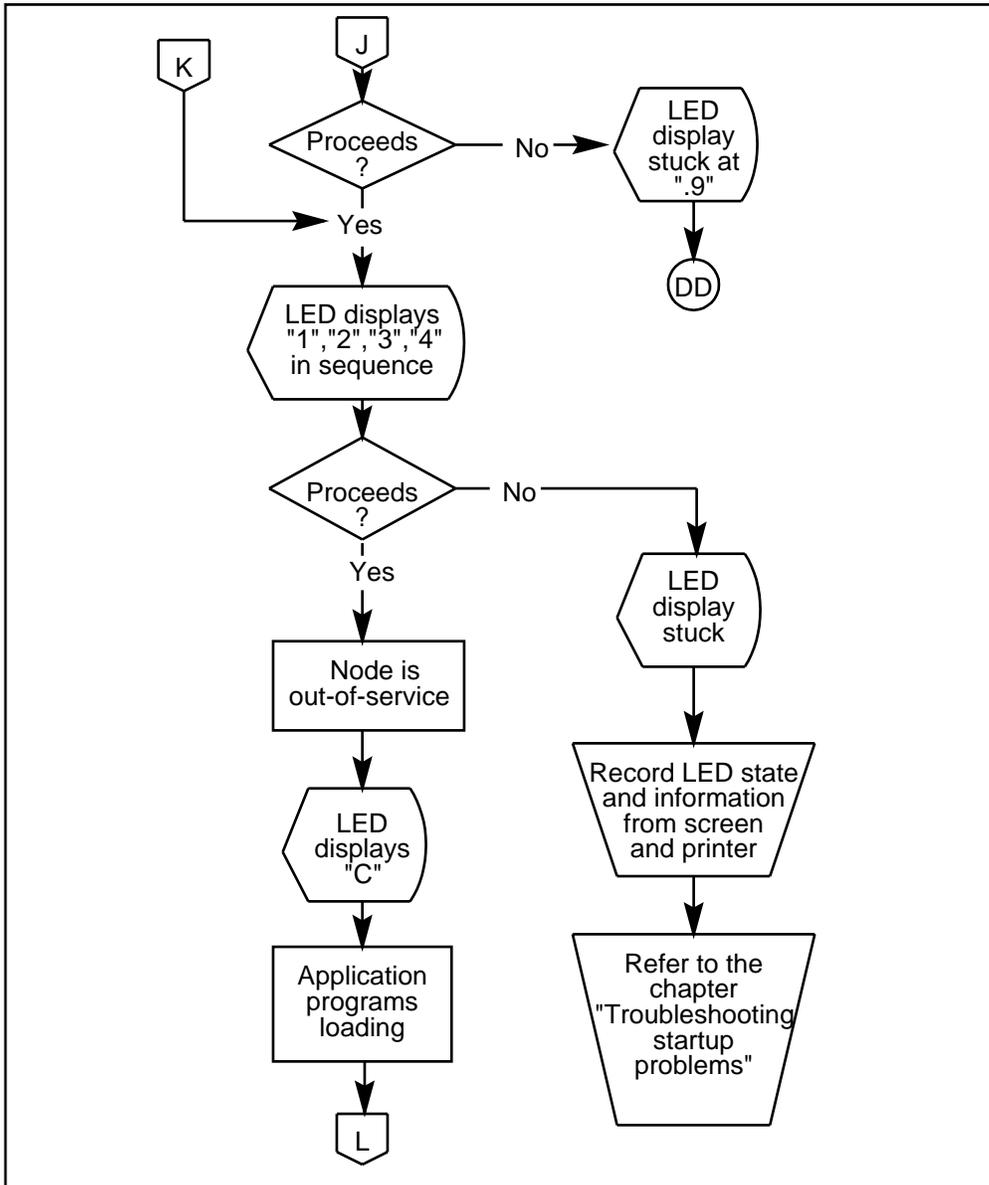


Figure 21-1 (continued)
MMP40 Troubleshooting Flowcharts

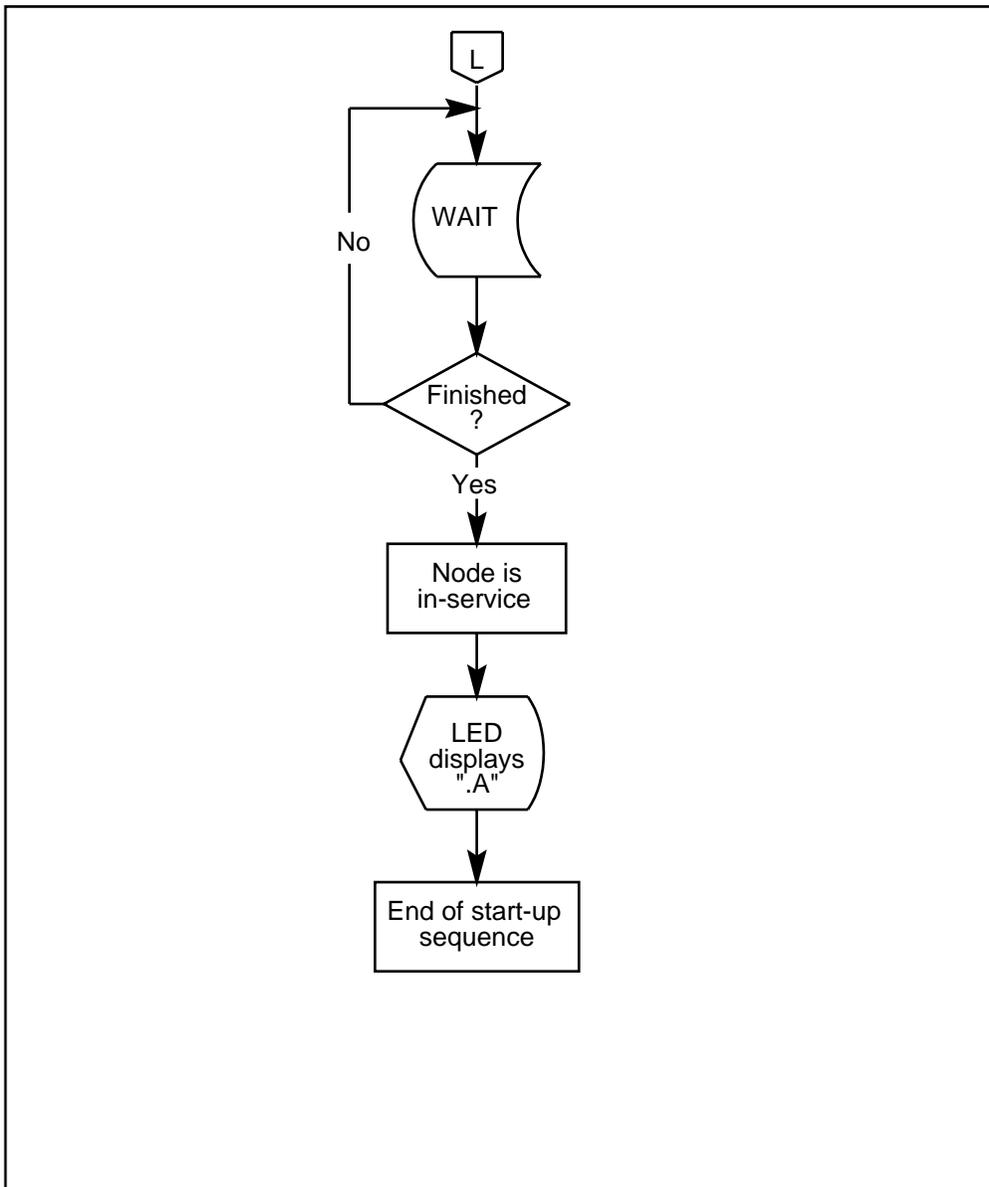


Table 21-1
AA - LED stuck at ".4"

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 21-2
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 21-3
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.

21-14 MMP40 troubleshooting flowcharts

Table 21-4
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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Installation and Maintenance Guide

Customer Documentation
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522 University Avenue, 14th Floor
Toronto, Ontario, Canada
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Publication number: 555-7041-250
Product release: 10.0
Document release: Standard 1.0
Date: August 1995

Printed in the United States of America

The logo for Nortel, featuring the word "NORTEL" in a bold, sans-serif font. The letter "O" is stylized with a globe icon integrated into it, showing latitude and longitude lines.