

Meridian Mail Options

Maintenance Procedures

Publication number: 555-7011-500
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 Product release 10.0 of Meridian Mail for the Options platforms. This edition makes all previous editions obsolete.

April 1995

Manual released as Standard 1.0. This version documents Product release 9.5 of Meridian Mail for the Options platform. This edition makes all previous editions obsolete.

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About this document

This Northern Telecom Publication (NTP) describes maintenance procedures to be followed by the Meridian Mail system administrator or technician.

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

The Hardware Maintenance section describes how to repair or replace a faulty hardware part. Only parts that can be replaced in the field are covered in this document. The parts are

- Printed Circuit Packs (PCPs)
- power converter assembly
- hard disk subsystem
- cartridge tape unit

For information on replacing other hardware components refer to the *Meridian Mail Options Installation Guide* (NTP 555-7011-210).

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

- Meridian Mail backplane assembly
- cable harnesses
- shelf assemblies

For more information on how to check the status of the channels (that is, if they are idle or active), status of nodes, and how to courtesy down nodes and the system, refer to one of the following administration guides:

- *Meridian Mail System Administration Guide* (NTP 555-7001-301) for non-multi-customer sites
- *Meridian Mail System Administration Guide for Multi-customer Systems* (NTP 555-7001-302) for multi-customer sites
- *X11 Input/Output Guide* (NTP 553-3001-400)
- *SL-1 Fault Clearing* (NTP 553-3001-510)

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: Troubleshooting startup problems

When following the procedures in this section, go through each 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. In such instances, courtesy down the system before powering it down. This will ensure that all channels on the node are idle before powering down, and user sessions are not terminated.

ATTENTION

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

System fails to respond, fans not running

Procedure 1-1

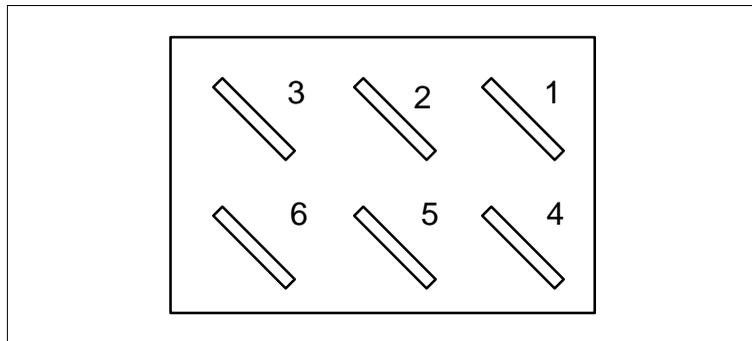
System fails to respond, fans not running

- 1 Check fuse in fan unit fuse panel.
If necessary, replace it.
- 2 Check for nicks in wiring between power distribution and fan.
If the wiring is faulty, have it replaced by service personnel.

1-2 Troubleshooting startup problems

- 3 Ensure that wire harness is properly connected to the power distribution unit at fan unit power connector.
If connected incorrectly, reconnect wire harness.
- 4 Check power distribution unit.
If a problem is evident, replace the unit.
- 5 Check DC voltage at fan unit.
 - a. Disconnect the power cable from the fan unit.
 - b. Measure the voltage at pins 3 and 4 on the power cable connector (see Figure 1-1).
The measurement should read -52 V DC. If the voltage is correct but the fan isn't running, replace the defective fan unit.

Figure 1-1
Power connector pin outs on fan unit



LEDs on power converters are not lit, but terminal is okay

ST/RT Option and Option shelf

Procedure 1-2

LED on power converters not lit

- 1 Check breaker on power distribution unit.
If faulty, reset breaker.
- 2 Check nicks in wiring between power distribution and backplane.
If problem exists, have wiring harness replaced by service personnel.
- 3 ST/RT Option only: Refer to the procedure for DC problems as outlined in the *SL-1 Fault Clearing* (NTP 553-3001-510).
- 4 Option only:
 - a. Check wiring harness. Ensure it is properly connected to the power distribution unit.
Reconnect if necessary.
 - b. Remove the plastic cover from the terminal block.
 - c. Measure DC voltage at TB2-3 or 4 and chassis for -52 V DC.
 - d. Check wiring to power distribution terminal block.
If faulty, have wiring replaced by service personnel.
 - e. Check wiring from power distribution unit to DC terminal block (at bottom of cabinet).
If wiring is faulty, have wiring harness replaced by service personnel.
 - f. Check the power distribution unit.
Replace it if faulty.

DC voltage problems

ST/RT Option and Option shelf

Procedure 1-3

DC voltage problems

- 1 Inspect the DC power wiring harness connecting the disk drive, tape drive, and tape drive controller. Look for nicks or breaks in the wiring.
If a defect is found, ship Meridian Mail to the repair depot because the wiring harness is not field-replaceable.
- 2 Disconnect Meridian Mail from the DC mains.

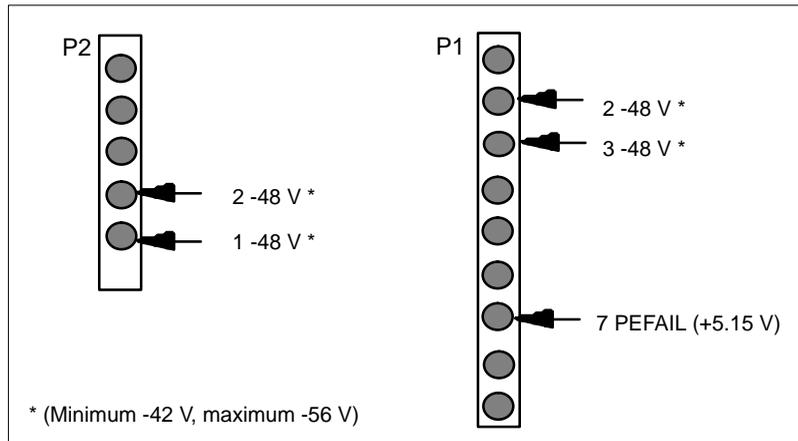
1-4 Troubleshooting startup problems

- 3 Remove the power connector P2 from the voltage regulator at the rear of the cabinet. Reconnect the Meridian Mail cabinet to the DC mains.
- 4 Apply power to Meridian Mail and measure the voltages at the P2 connector.

Readings should match those shown in Figure 1-2.

- 5 Repeat steps 2 to 4 for power connector P1.

Figure 1-2
Backplane pinouts



- 6 ST/RT Option: Measure the following voltages at the test points on the QPC691 power converter faceplate:

+12 V DC (minimum +11.4 V, maximum +12.6 V)

-12 V DC (minimum -11.4 V, maximum -12.6 V)

+5 V DC (minimum +5.10 V, maximum +5.15 V)

If incorrect voltages are measured at the backplane connector, continue to the "Tape shelf power check" section in this chapter.

Tape shelf power check

If the power checks from the previous tests indicate incorrect voltages, perform the following procedure to test the power to the tape shelf.

Procedure 1-4

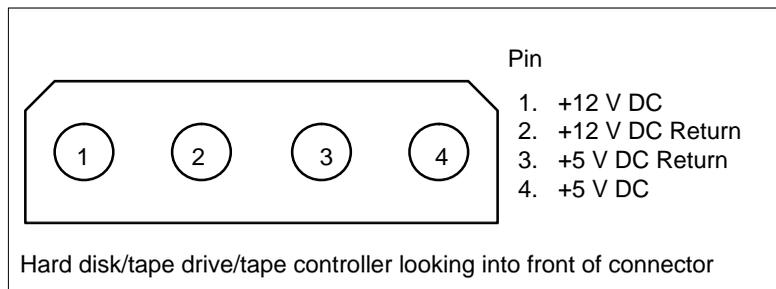
Tape shelf power check

- 1 Check QPC585 power converter LED and ensure the power is turned on.

- 2 Check QPC585 power converter and disconnect from disk. Check LEDs. Repeat this procedure for tape drive and controller. Replace the power converter or the unit suspected of causing the problem.
- 3 Power down Meridian Mail and, from the front of the cabinet, remove power connector P3 from the hard disk. Power Meridian Mail back up and measure the voltages at P3 (see Figure 1-3).

If the voltages are now correct, replace the hard disk drive and its connections, and restart the system.

Figure 1-3
DC power connector pinouts



If incorrect voltages are measured at hard disk power connector P3, do the following:

- a. Power down the system.
- b. Remove the hard disk.
- c. Remove the tape chassis.
- d. Remove the power cable from the tape drive.
- e. Reinstall the hard disk and re-connect the power cable.
- f. Disconnect the tape drive on the chassis and leave the tape drive controller connected.
- g. Power up Meridian Mail and measure the voltages at tape drive connector P2.

If they are now correct, replace the tape drive and all removed power connectors, then restart the system.

- 4 If incorrect voltages are measured at tape drive power connector P2, do the following:
 - a. Power down Meridian Mail, and remove the tape drive controller and power cable P4.
 - b. Replace the tape drive power cable P4.

- c. Power up Meridian Mail and measure the voltages at P4.

If the voltages are now correct, replace the tape drive controller and all removed power connectors, then restart the system.

- 5 If incorrect voltages are read at the tape drive controller, replace the MSU power converter (QPC585) and restart the system.

Troubleshooting terminal problems

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

If terminal remains blank

Procedure 1-5

If terminal remains blank

- 1 If the power LED on the terminal is not lit, check for power problems as follows:
 - a. Check that the terminal power switch is ON. Verify that there is power at the socket where the terminal is plugged in.
 - b. Check the power cord, and replace if necessary.
 - c. Check the terminal cabling and setup as described in Procedure 1-6.
 - d. If all of the above tests are OK, replace the terminal.
 - e. If the power LED remains unlit, replace the prime node's MMP40 card and return to the beginning of this procedure.
- 2 Bootup problems can be caused by hardware components which are not properly seated in the chassis. To check for possible card cage problems, do the following:
 - a. Power off the system.
 - b. Loosen, then reseal each PCP.
 - c. Power on the system.
- 3 While the system reboots, observe the hexadecimal display on the prime node's MMP40 card.
 - a. If the hexadecimal display stops at .3 or earlier, check the "Normal Startup Sequence" section in this chapter to determine the bootup task corresponding to this stopping point.
 - b. If the hexadecimal display increments past .3 but the screen remains blank, there may be a problem with the MMP40 card. Replace the MMP40 card and return to step 1.

- 4 If none of these steps succeeds in solving the problem, contact your Nortel support organization.

Terminal cables and setup

Procedure 1-6

Terminal cables and setup

- 1 Make sure the terminal is installed and configured properly as described in the "Terminal Configuration" section of *Options Installation Procedures* (NTP 555-7011-210).
- 2 If the terminal was working previously, enter terminal setup and perform "Clear communications," then reset terminal.
- 3 If the terminal was working previously and the printer is printing SEER reports, enter terminal setup and verify that the terminal is not in controller print mode. Print mode should be "Normal Print Mode" for all terminals, except the HP700/32. For the HP700/32, enter terminal setup and set the user "Aux Mode" to OFF.
- 4 Ensure that the "Hold screen" key is not on. If the terminal indicates "Hold" (status area at bottom of screen or LED on keyboard), press F1 to release the hold.
- 5 Check all cable connections to terminal.
- 6 Replace cables and adaptors one at a time.
- 7 Check printer setup and status.
Refer to "Appendix C: Printer switch settings" in *Options Installation Procedures* (NTP 555-7011-210) for the correct printer setup.
- 8 Clear any printer faults (out of paper, paper jam), and put printer on-line.
- 9 To make sure the terminal is functional, enter setup mode, change the terminal setup to enable "LOCAL ECHO" and, with the printer attached, enter text from the terminal keyboard. The text you enter from the keyboard should echo on the terminal screen. Disable "LOCAL ECHO".
- 10 Check terminal primary port using method described in terminal owner's manual.
- 11 Add a null modem adaptor if one was not installed between Meridian Mail and the terminal. Remove the null modem adaptor if one was installed.
- 12 If all of the above tests are OK and none of the replacements fix the problem, replace the terminal.

Normal startup sequence

When you power on Meridian Mail, the MMP40 single board computer must first initialize itself. It then proceeds with booting up the other system elements (non-prime node and the disk subsystem) and finally loading the Meridian Mail operating system and the MMI. The MMP40 initialization phase can be monitored via the Hexadecimal display on the edge of the card while the bootup can usually be monitored via the text displayed on the terminal (although the two will overlap at some points). The following sections describe the Hexadecimal display, then the progression through bootup.

Power on initialization—Hexadecimal display description

On the edge of the MMP40 card is a seven-segment display that can display a hex digit with an optional decimal point on either side of it. The primary purpose of the display is to provide additional information for diagnosing 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 normal MMP40 board, this state is generally not seen because of the very quick transition to the .0 state.

Table 1-1 shows the general progression of the digits shown on the Hexadecimal display.

Table 1-1
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
–continued–	

Table 1-1
Typical startup indications on Hexadecimal display (continued)

Display shows	Description
.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).
-end-	

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 1-2 shows the key phrases that will appear onscreen informing you that the various stages are proceeding normally. The intermediate text between these key phrases has been omitted since its content is dependant upon your specific configuration.

You may set the printer to print out a hard copy of the bootup sequence as described in Procedure 1-7.

If bootup does not proceed as described in Table 1-2, refer to the procedures in the section entitled “System fails to boot completely” to identify the problem.

Procedure 1-7
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 will begin printing on the printer, and "Aut." appears at the bottom of the terminal screen.
- 3 Press <Ctrl> and <Printscreen> again to turn off automatic printing.
"Aut." should disappear from the bottom of the screen.
- 4 Compare the bootup printout to the information presented in Table 1-2.

Table 1-2
Bootup stages

Stage	Key phrases	Comments
1	<pre> Waiting for timer... . . . Copyright 19yy, Nortel ***** * NT4R45aa Firmware * * MMP40PX - XXX * * Mmmm DD, 19YY * ***** . . . </pre>	<p>Where "aa" can be any two letters, each "x" may be replaced by a digit, 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 diagnostics</p>
<p>–continued–</p>		

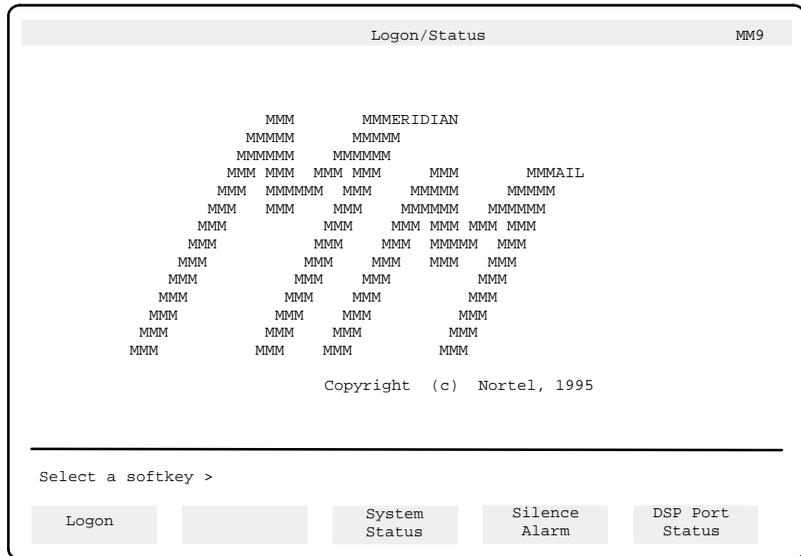
Table 1-2
Bootup stages (continued)

Stage	Key phrases	Comments
3	Performing SCSI Bus Reset...OK. . . .	
4	SCSI initialization complete. . . .	
5	Meridian Mail Kernel Startup . . .	
6	OSP successfully loaded . . .	Terminal screen should clear. Operating system loaded on the node.
7	Enter CI to Load CI Only (5 sec) . . .	
8	Loading PRM . . . Program Resource Manager Ver. X . . .	Where "x" can be a combination of characters or digits.
-continued-		

Table 1-2
Bootup stages (continued)

Stage	Key phrases	Comments
9	<pre>PRM: Waiting for Seer Server to register . . . PRM RebootNode: resetting node 2 waittime 0 . . .</pre>	<p>SEER output on the printer should be expected a few seconds after this message.</p> <p>If this is a two-node system, then the non-prime node will be reset here.</p>
10	<pre>PRM Running startup diagnostics . . . PRM: OSP is Up - node 2 . . .</pre>	<p>Diagnostic programs are run</p> <p>On two-node systems, operating system (OS) is loaded on the non-prime node.</p>
11	<pre>PRM: Startup diags finished, starting up system</pre>	<p>Application programs are loaded.</p>
12	<p>The Logon screen comes up as shown in Figure 1-4.</p>	
<p>—end—</p>		

Figure 1-4
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 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 1-5.

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

See the “System status and maintenance” chapter in the *System Administration Guide* (555-7001-30x) for further information on system, link, node, and port status.

Figure 1-5
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 OutSv	Status Faulty	Pending	Other	Storage Voice	Used Text
1	MSP	InService							1%	4%
2	SPN	InService	0	16	0	0	0	0	1%	4%

Select a softkey >

Exit

Table 1-3
Troubleshooting bootup problems

Symptom	Possible causes and actions
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 the non-prime node (type SPN) is faulty, check the system bus.</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.	<p>1 Replace the MMP40 card.</p> <p>2 Perform the system bus checks.</p>
Logon screen appears, but not all voice channels come into service.	<p>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>
Disk errors on bootup-device sense key, or driver errors.	Refer to Procedures 1-9 and 1-10, and the section entitled "Common disk subsystem problems", Chapter 4 of this manual.
All nodes time-out while booting or node unloads while in service.	Perform the system bus checks.
Only one node comes up	Perform the system bus checks.
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 Nortel support organization.
—continued—	

Table 1-3
Troubleshooting bootup problems (continued)

Symptom	Possible causes and actions
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 555-7001-30x).
Hexadecimal display on MMP40 card shows D	Indicates in-service trouble. While the MMP40 card is still healthy, a component such as a card or a disk may be faulty. Check the cards for that node and perform Procedures 1-9 and 1-10, and refer to Chapter 4.
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 Nortel 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 point at which the state reverts to ".0." and contact your Nortel 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 Nortel support organization.
—end—	

System fails to boot completely

If the system stops during the process of booting up, refer to Table 1-2 to determine at which stage of the boot up 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 boot up, you must verify that the problem is not with either simple cabling errors or the terminal. Check that

- PCP installation and cabling conforms to Chapter 6 of the *Options Installation Guide* (NTP 555-7011-210) (meaning there are no loose or improperly installed cables)
- there are no problems with the terminal (refer to the procedures in the section entitled “Troubleshooting terminal problems”)

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 boot up has stopped if you print out a hard copy of the bootup sequence as described in Procedure 1-7.

Once you have determined at which stage the system is stopping, refer to Table 1-4 to find which procedure to follow.

Table 1-4
Troubleshooting bootup stages

Stage	Procedure
1 or 2	1-8
3	1-9
4	1-10
5, 6, 7, or 8	1-11
9	1-13
10	1-14
11	Follow the actions suggested in the the SEERs 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 Nortel support organization.

Procedure 1-8

Troubleshooting stage 1 or 2 bootup failure

If the terminal output stopped at stage 1 after the message “Time C tick OK,” but before the message “Enabling Instruction Cache,” or in stage 2 during the “BTGA tests...,” then proceed as follows:

- 1 Replace the HABC card.
- 2 Replace the MMP40 card.
- 3 Check for Meridian Mail power problems as described in Procedures 1-2 to 1-4.
- 4 Verify that all cards in the system are properly seated.

If the terminal output has stopped at some other point in stage 1 or 2, then proceed as follows:

- 5 Replace the MMP40 card.
- 6 Check for Meridian Mail power problems as described in Procedures 1-2 to 1-4.
- 7 Replace the HABC card.

Procedure 1-9

Troubleshooting stage 3 bootup failure—disk subsystem check

Failure during this stage of boot up could indicate problems with the SCSI subsystem. Proceed as follows:

- 1 Ensure that an incorrect Install/Data tape has not been left mistakenly in the tape drive.
- 2 Check the SCSI cable installation and the jumper settings. Refer to the disk drive figures in Chapter 5 of the *Options Installation Guide* (NTP 555-7011-210).
- 3 Check the power to disk and tape (+5 V, +12 V).
- 4 Replace disk as described in the “Disk Installation” section in the *Options Installation Guide* (NTP 555-7011-210).

Procedure 1-10
Troubleshooting stage 4 bootup failure

If the boot up 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 1-9.
- 2 Check that the SCSI devices are terminated as described in the "Disk installation" section in the *Options Installation Guide* (NTP 555-7011-210).
- 3 Check that the tape drive is properly terminated as described in the "Installing the disk/tape unit in node 1" section in the *Options Installation Guide* (NTP 555-7011-210).
- 4 If the bootup display shows error messages such as "bus error," this can indicate a serious problem with your SCSI disk. Contact your Nortel support organization.

Procedure 1-11
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 Nortel support organization.

Procedure 1-12
Troubleshooting stage 8 bootup failure

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

Procedure 1-13
Troubleshooting stage 9 bootup failure

This stage normally should take approximately five minutes. However, on a two-node system, if a remote node is having problems booting up, then this state can take as long as 20 minutes. Proceed as follows:

- 1 Check the SEER output from the printer for problems with remote nodes.
- 2 If the non-prime node is having problems, then replace the MMP40 card of that node.
- 3 Perform system bus diagnostics.

Procedure 1-14
Troubleshooting stage 10 bootup failure

If the boot up 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 SEERs in the *Maintenance Messages (SEERS) Guide* (NTP 555-7001-510).
- 2 Observe the terminal output during stages 7, 8, and 9 for any indications that Node 1 is not InService. If there are indications that Node 1 is not InService, contact your Nortel support organization.
- 3 If Node 1 is InService, but the system will not progress past stage 10, then proceed as follows:
 - a. Replace the MMP40 card in node 1.
 - b. Check for Meridian Mail power problems.
 - c. Perform system bus diagnostics.

System running; then goes down

Procedure 1-15
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, record the problem and 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.

Disk subsystem check

Procedure 1-16

Disk subsystem check

- 1 Check the SCSI cable installation and the jumper settings. Refer to Figures 3-6, 3-9, 3-10, 3-11, 3-12, and 3-13.
- 2 Check the power to disk and tape (+5 V, +12 V, +24 V).
- 3 Replace MMP40 board.
- 4 Replace disk.

Chapter 2: Troubleshooting operational problems

This chapter contains troubleshooting information for any problems that occur on a system that has successfully booted up (that is, when the system is powered on, all of the diagnostics are completed successfully, and the Logon screen appears on the administration terminal).

System-level problems

Procedure 2-1

System status remains FAULTY or OUT-OF-SERVICE

- 1 Check SEER printout for related messages.
Take appropriate action as described in *Meridian Mail Maintenance Messages (SEERs) Reference Manual* (NTP 555-7001-510).
- 2 Verify correct database programming for the IOC/MPC in the Meridian 1.
- 3 Make sure the Meridian 1 contains the software options and ROM card to support the SMDI options.
Refer to *Meridian Mail Options Installation Guide* (NTP 555-7011-210).
- 4 Disable and reseal the IOC/MPC card.
- 5 Replace the following card, one at a time: IOC/MPC card and cable, MMP40 card, and any intermediate cables or filter connectors.
- 6 Determine if any nodes shows FAULTY or OUT-OF-SERVICE status.
If any nodes do show FAULTY or OUT-OF-SERVICE status, follow the fault-clearing procedures in this chapter for the following:
 - card cage problems
 - system fails to boot completely

- disk subsystem check
 - no SCSI address 0, 1, or 2
- 7 Determine if any of the voice cards show FAULTY or OUT-OF-SERVICE status.
- If a voice card shows FAULTY or OUT-OF-SERVICE status, proceed as follows:
- a. Disable the card. For detailed instructions on disabling the card, refer to the *System Administration Guide* (NTP 555-7001-30x).
 - b. Perform out-of-service diagnostics.
 - c. Reenable the card.

Procedure 2-2

“Service is unavailable”when calling Meridian Mail

- 1 Verify that the Meridian Mail DN is properly configured in the VSDN table.

See the *System Administration Guide* (NTP 555-7001-30x) for configuration details.

AML (ISDN/AP) link problems

Procedure 2-3

System status shows “Faulty link to PBX”

- 1 Ensure that the ISDN/AP cable is in place.
- 2 Check that the Meridian 1 has been properly configured. Refer to the *Options Installation Procedures* (NTP 555-7011-210).
- 3 Make sure the TNs and DNs are correct.
- 4 Test as outlined in Chapter 5 “AML (ISDN/AP) link maintenance.”
- 5 Make sure the AML link is up.

Voice card/channel problems

Procedure 2-4

Channel status is FAULTY or OUT-OF-SERVICE

- 1 Disable each voice card and perform out-of-service diagnostics on the cards.
- 2 Reenable each card.
- 3 Check the SEER printout for any VSS load errors for that particular channel.
- 4 Check the SEER printout for any driver fault messages (software messages) for that channel. Refer to the *Maintenance Messages (SEERs) Reference Manual* (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, reenable the channel online simply by disabling and then reenabling that specific channel.

- 5 Disable each NVP card and perform out-of-service diagnostics on the cards. Reenable each card.
- 6 Ensure that the voice cards in the correct node are properly seated.
- 7 Verify that the voice card cable connections are secure.
- 8 Verify that the Utility card cable connections are secure.
- 9 Check voice card switch settings. Refer to the *Options Installation Guide* (NTP 555-7011-210)).
- 10 Replace the voice card.
- 11 Check fuses to see if they are blown.
If fuses are okay, replace the NVP card.
- 12 Ensure that NVP packs in node are properly seated.
- 13 Unseat all NVP packs in node.
- 14 Verify that the NVP cable connections are secure.
- 15 Check NVP switch settings. Refer to the *Options Installation Procedures* (NTP 555-7011-210).
- 16 Replace the NVP card.

Procedure 2-5

Channel status remains "Loading"

- 1 Verify that the Meridian Mail channels have a corresponding ACD agent programmed in the Meridian 1.

2-4 Troubleshooting operational problems

- 2 Verify that the Network loop cable is connected properly on both the Meridian Mail and Meridian 1 sides.
- 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 2-6

Silent channel—calls have no voice and produce a SEER

- 1 Make sure that Meridian Mail has been configured with valid TNs.
- 2 Check the switch settings on the NVP card(s) (particularly S5-7).
- 3 Ensure that each network loop is configured on the Meridian 1.
- 4 Verify that all NVP card and network loop cables are securely connected.
- 5 Make sure that each network cable connecting Meridian Mail to a network board is installed to the correct loop connector on the network board.
- 6 If there is daisy-chaining, make sure there is no board in the slot on the PE shelf specified by the TN in Meridian Mail.
- 7 Disable, reseal, and reenale the NVP card(s).
- 8 Disable and unseat the NVP card(s), initialize the Meridian 1, then reseal the NVP card(s).
- 9 Replace the network loop cable.
- 10 Reconfigure another port on the network card if one is available.
- 11 Replace NVP card.

Procedure 2-7

Channel status IDLE, but cannot be acquired

- 1 Check the status of the channels.
- 2 Check datafill on Meridian Mail and PBX (for the SCN and channel DN).
- 3 Check SEER printout for messages related to that channel.
- 4 Take the appropriate action for that SEER.
- 5 Disable/reenale the channel on the PBX.

If these procedures are unsuccessful, record detailed information and contact the appropriate personnel.

- 6 Verify that the Message Desk assignment in the PBX matches the routing address in the Channel Allocation Table (CAT).
- 7 Verify correct DN entry for the VSDN table and CAT data entry.

Administration problems

Procedure 2-8

Cannot logon remotely

- 1 See “Terminal fails to respond or locks up” section in this chapter.
Verify that the local administration terminal, printer, modem, and remote administration terminal are all set up correctly, according to the *Options Installation Procedures* (NTP 555-7011-210).

Procedure 2-9

Terminal responds, yet logon is unsuccessful

- 1 Check that you are entering the correct password.
- 2 Check to ensure timestamp has been issued. Look for a SEER with a timestamp.
- 3 If this is your fourth failed logon attempt, the system will make you wait 10 minutes before you can try again.

Procedure 2-10

Optional feature purchased, but unavailable

- 1 Verify the installed features from the General System Administration.
- 2 Perform Expand feature procedure as outlined in the *System Installation and Modification Guide* (NTP 555-7001-215). If the procedure fails, check SEER printout for any incorrect data entries such as keycode number or serial number.
- 3 Verify the features were ordered correctly.

Procedure 2-11

Voice services—submenu revert DN doesn't work

Submenus revert to their parent menu; however, the following application can be used to revert to a specific DN:

- 1 Program the delayed response and initial no-response for that submenu as a calling function (CL) to the intended revert DN.

Procedure 2-12

System backups do not complete properly

- 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 sales representative. If you do not receive tapes with a new system, report the problem to your representative.

- 2 Examine SEER printouts for information on where the error is occurring.

Consult the *Maintenance Messages (SEERs) Reference Manual* (NTP 555-7001-510) for each relevant SEER and the appropriate action to take for that SEER.

- 3 Verify that DC power connectors (P3, P4, and P5) have the correct voltages. See the "DC voltage problem" section in this chapter.
- 4 Verify that all SCSI cable connections are secure.
- 5 Verify that the ribbon cable tracer is on the left side of the tape controller board (when viewed from the rear) and on the right side of the disk drive.
- 6 If the backup was unsuccessful, substitute a replacement tape drive or disk drive, and attempt the backup again.

Note: Verify the full or partial backup was successful before system cutover.

Procedure 2-13

Parity error from tape drive during backup

- 1 Try the backup again with a different tape.
- 2 Power down and reseal the MMP40 card and the QPC585 power converter pack.
- 3 Verify that SCSI cabling is secure.
- 4 Replace the following components one at a time, and test the backup after each replacement.
 - QPC585 power converter
 - MMP40 card
 - tape unit

User-reported problems

Procedure 2-14

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

- 1 Ensure that all Meridian Mail users have Message Waiting Allowed (MWA) class of service configured for the telephone sets on their PBX.
- 2 Ensure that all Meridian Mail users have Message Waiting Indicator (MWI) class of service configured for the telephone sets on their PBX system.
- 3 Increase user's storage limit if the limit is exceeded frequently and the user is complaining of delayed messages.
- 4 Send a broadcast message and verify that all users receive MWI.
- 5 Run set MWI utility from Tools level and verify all users receive MWI.
- 6 Check fuse on Message Waiting Power supply on the Meridian 1.

Procedure 2-15

Call Sender doesn't work for any calls

- 1 Confirm that the customer number on 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 Revert DN is valid, and check any restrictions that may apply.
- 3 Verify that the Meridian Mail ACD agents have Transfer (TRN) and Conference (A03) programmed on the correct keys (6 and 7, respectively).

Check configuration against the *Meridian Mail Options Installation Procedures* (NTP 555-7011-210).

- 4 Verify that all Meridian Mail users have a Conference capability programmed for their telephone set.
- 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 cursor to "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 call is unsuccessful, check Meridian 1 and Meridian Mail databases for dialing restrictions.

Procedure 2-16 **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 the Meridian Mail Options Installation Guide (NTP 555-7011-210) for details. The Meridian 1 must be initialized after changing these prompts.
- 2 Test AML (ISDN/AP).
- 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 Replace the ESDI ribbon cable with a shielded cable (for example, A0355244 or A0345245).
- 5 Increase user's storage limit if the limit is exceeded frequently and the user is complaining of delayed messages.

Procedure 2-17 **Revert DN does not work**

- 1 Verify that the Meridian Mail ACD agents have been programmed properly (that is, ensure that Transfer (TRN) is programmed on key 6).
- 2 Check the configuration against the *Options Installation Procedures* (NTP 555-7011-210).
- 3 Verify that a Night Call Forward (NCFW) DN has been programmed in the ACD queue for Meridian Mail.
- 4 Verify that the correct revert DN appears in the user mailbox profile.
Use the Modify User command to check the mailbox setup.
- 5 Verify that the user is correctly performing custom revert feature. Refer to the *Meridian Mail User Guide*.
- 6 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 cursor to "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 call is unsuccessful, check Meridian 1 and Meridian Mail databases for dialing restrictions.

Chapter 3: Hardware maintenance

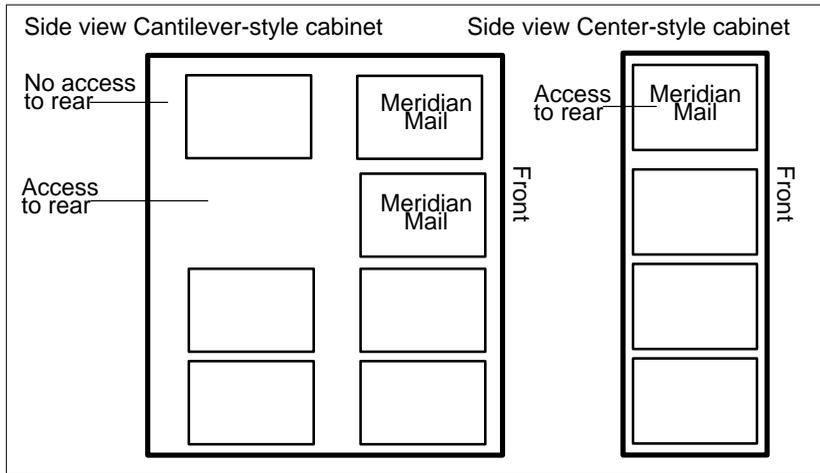
This section provides procedures for the following should they become necessary:

- power supply removal and replacement
- printed circuit pack (PCP) removal and replacement
- disk unit removal and replacement
- tape drive assembly removal, replacement, and cleaning

To service the tape drive, hard disk drive, and their related cables/harnesses, the Meridian Mail Options shelf must be removed from the Meridian 1 cabinet.

This is only to access the rear of the shelf. If there is no other shelf behind Meridian Mail as in the Center Mount style, then access to the rear is provided without shelf removal. See Figure 3-1.

Figure 3-1
Rear access to the Meridian Mail Option shelf



Power supply

Removing and replacing a power supply

Procedure 3-1

Removing and replacing a power supply

- 1 Shut off power to the Meridian Mail shelf using the circuit breaker located at the bottom of the Meridian 1 cabinet.
- 2 Select the proper breaker number corresponding to the location of Meridian Mail unit.
(Option only) The main power circuit breaker for the shelf is located on the QBL21 for Cantilever Mount and the QBL10 for Center Mount. See Figure 3-1. These are the power distribution units for Meridian Mail.
- 3 Locate the power converter to be serviced. The PCPs are powered by the QPC691, and the Mass Storage Unit is powered by the QPC585. (See Figure 3-3.)
- 4 If power to the Meridian Mail unit has been properly turned off, the LEDs on both power converters should be off. The packs have ejectors to remove them from their locations. Eject the packs by grasping the card ejectors. Slowly pull the pack(s) out of the shelf.
- 5 Insert a new pack into the proper location and lock the card ejectors.

- 6 Prior to turning power back on, make sure packs are securely locked in place and no other components have been disturbed.
- 7 Turn power back on at the circuit breaker.

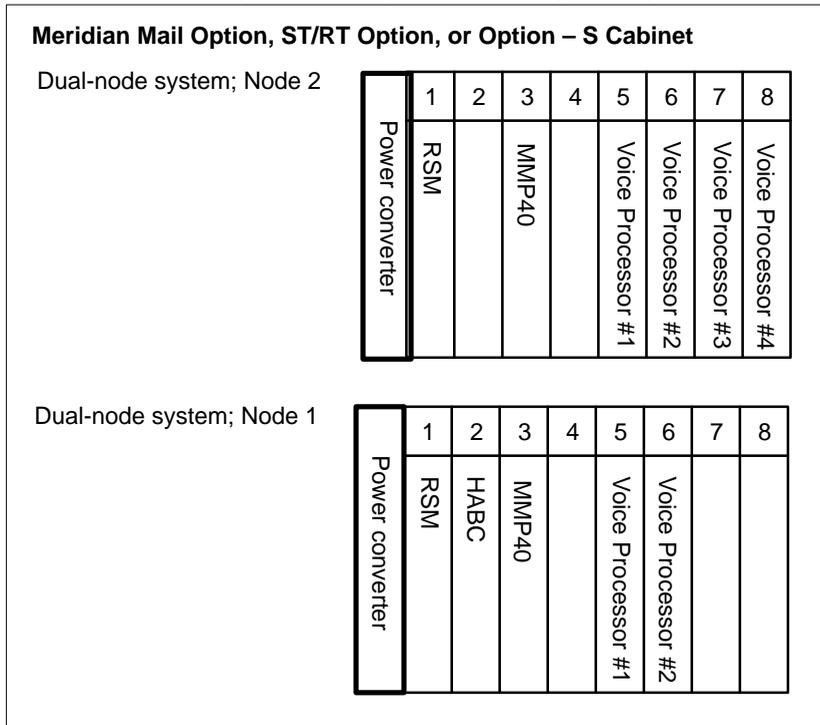
Printed circuit packs

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

- Meridian Mail Processor, 68040 single board computer (MMP40)
Note: The MMP40 PCP replaces the ESBC, SCSI, and two RAM cards.
- High Availability Bus Controller (HABC) required for two-node systems
- RS232 Service Module (RSM)
- Network Voice Processor (NVP) (4 ports per board)

The PCP slot positions are shown in Figures 3-2 for Option, ST/RT Option, and Option – S cabinet. See *Options Installation Procedures* (NTP 555-7011-210) for PCP switch and jumper settings.

Figure 3-2
Printed Circuit Pack positions—Option, ST/RT Option, Option – S



Removing and replacing a PCP



DANGER
Risk of electrocution

Disconnect the power from the Meridian Mail system before beginning this procedure.

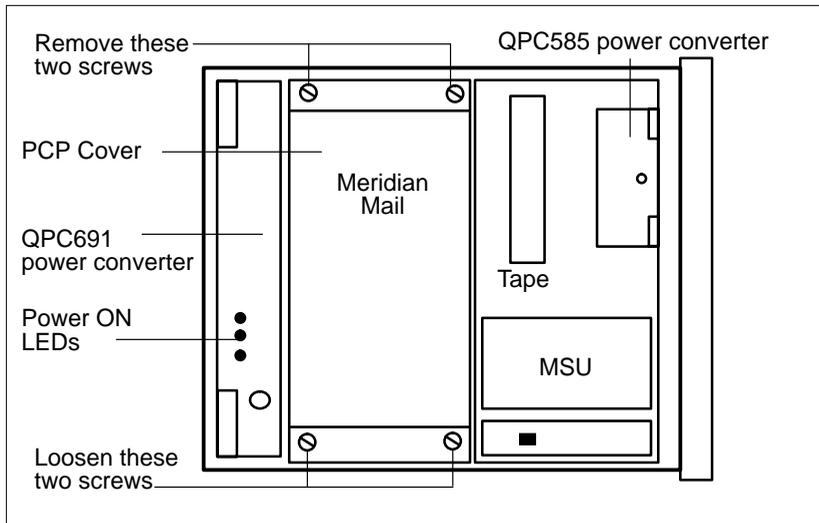
**CAUTION****Risk of equipment damage**

The Printed circuit packs are not designed for insertion with the power on (“hot” insertion). The circuit packs are susceptible to static damage. Before handling circuit packs, take appropriate precautions.

Procedure 3-2
Removing and replacing a PCP

- 1 Locate the circuit pack cover on the Meridian Mail shelf (see Figure 3-3).

Figure 3-3
PCP cover location (ST/RT Option, Option)



- 2 Remove the two top screws that fasten the cover to the shelf and set them aside. Loosen, but do not remove, the two bottom screws of the cover. Lift the cover away from the shelf and set it aside.

- 3 If there are cables attached to the front of the card to be replaced or checked, disconnect them. Use the card ejectors to remove each PCP.
The designation strip at the bottom rail of the shelf identifies the locations of each pack. Circuit pack locations depend on system size. See Figure 3-2 (Option, ST/RT Option, and Option – S cabinet).
- 4 Verify the switch and jumper settings on the replacement PCP. See *Options Installation Procedures* (NTP 555-7011-210).
- 5 Slide the replacement PCP into the correct slot and fasten the card ejectors. Reattach cables if necessary.
- 6 After ensuring that all cables are properly attached, fasten the cover.

Disk units

Meridian Mail Options supports the disk and tape assemblies listed in Table 3-1. If you are using a disk or tape assembly that is not listed in this table contact your Northern Telecom distributor for more information.

Table 3-1
Disk and tape assemblies

Assembly number/ common product code	Title of assembly	Models included	Individual product codes
NT6D47BA / A0393283	300-Mbyte Hard disk unit	Maxtor LXT340SY	A0351371
		Seagate ST3390N	A0602257
		ST4376N	
NT6D47DA / A0398354	300-Mbyte disk and 250-Mbyte tape unit	Seagate ST5660	A0616840
		Seagate ST3390N	A0602257
		Maxtor LXT340Sy	A0351371
NT6D48AA / A0365883	600-Mbyte Hard disk module	Maxtor XT8760S	A0354197
–continued–			

Table 3-1
Disk and tape assemblies (continued)

Assembly number/ common product code	Title of assembly	Models included	Individual product codes
NT6D48DA / A0398355	1.0-Gbyte disk and 250-Mbyte tape unit	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 DESP3107	A0383809
		Seagate ST11200N	
		Seagate MXT11200N	
		DEC DSP3107	A0616792
		Seagate ST31230N	
NT6D48EA / A0629940	1.2-Gbyte disk and 2.5-Gbyte tape drive unit	Seagate ST31230N	A0616792
NT4R28AC	Sub Assy, 250-Mbyte Tape drive, MSU	Archive	
NT4R28BA / A0629941	Sub Assy, 2.5-Gbyte- Tape drive, MSU	Tandberg	
-end-			

Removing disk units



WARNING

Risk of electrocution

Disconnect the power supply from the Meridian Mail system before removing and replacing the disk unit.



CAUTION

Risk of equipment damage

Use extreme care and wear a grounding strap when installing the disk unit, because it is extremely susceptible to damage as a result of rough or improper handling.

Procedure 3-3

Removing a disk unit

- 1 Locate the opening for the disk unit on the Mass Storage Unit (MSU). See Figure 3-4.
- 2 Remove the disk retainer bracket attached to the bottom of the Mass Storage shelf. Set the two screws and the bracket aside.
- 3 Move to the rear of the shelf/cabinet and locate the Rear MSU access cover (see Figure 3-5)
- 4 Lift the cover away from the rear shield and set it aside.
- 5 Remove the Small Computer Systems Interface (SCSI) data cable and the DC power harness from the disk unit (see Figures 3-6 and 3-9).

Figure 3-4
Disk unit location

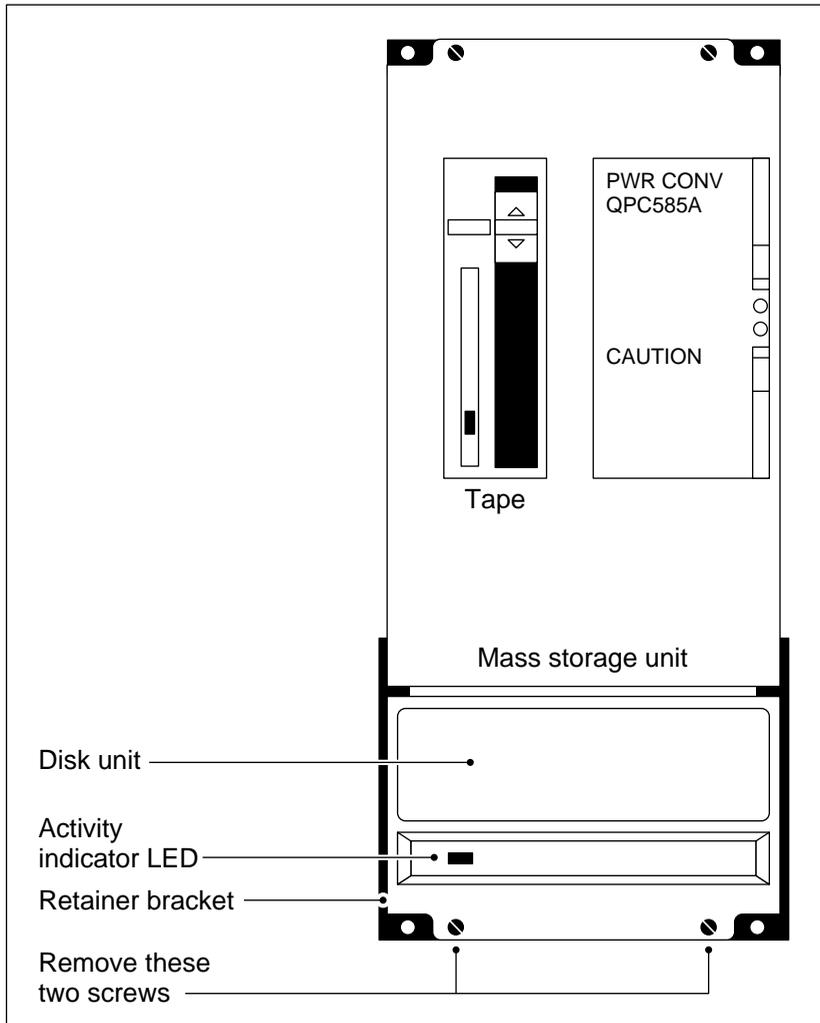
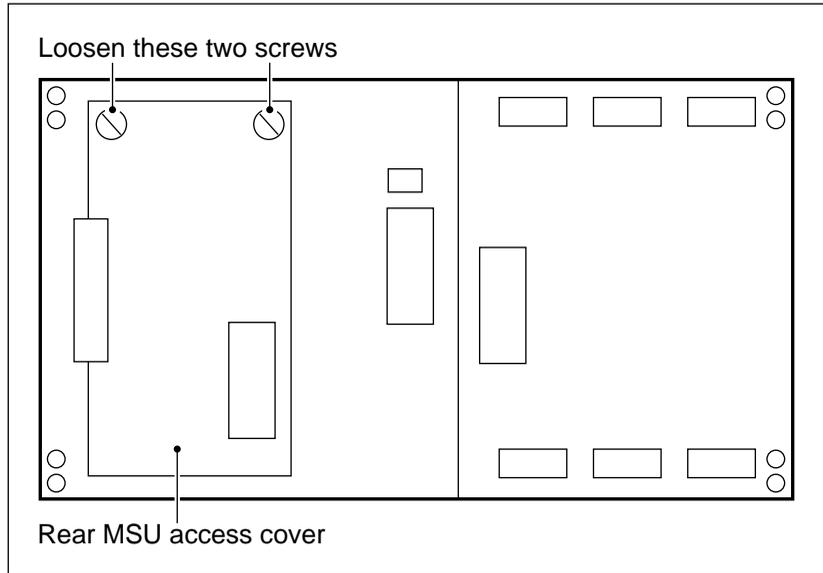


Figure 3-5
Rear Mass Storage Unit cover location



Installing a disk unit



DANGER
Risk of electrocution

Disconnect the power supply from the system before removing and replacing the disk unit.



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.

Procedure 3-4
Installing a disk unit

- 1 Ensure that the new disk drive has the same PEC, including suffix, as the one on your packing slip.

- 2 Move to the front of the cabinet/shelf and slide the old disk unit out.
- 3 Check the jumper settings on the replacement disk (see Figures 3-6 to 3-15) and carefully insert it into the opening.
- 4 The disk is fully inserted into the opening when the disk bezel is in contact with the sheet metal of the Mass Storage unit. Reinstall the disk retainer bracket previously removed.
- 5 Attach the data and power cables to the proper connectors on the disk.
Note: The data cable is not keyed. The red stripe goes to the right side of the disk (rear).
- 6 After ensuring that all of the cables are properly attached and that no other components have been disturbed, reattach the rear access cover (and power converter unit for replacement of a non-prime disk), and tighten the screws.

Figure 3-6
300-Mbyte Seagate Wren IV 94171 disk drive connectors and jumper settings

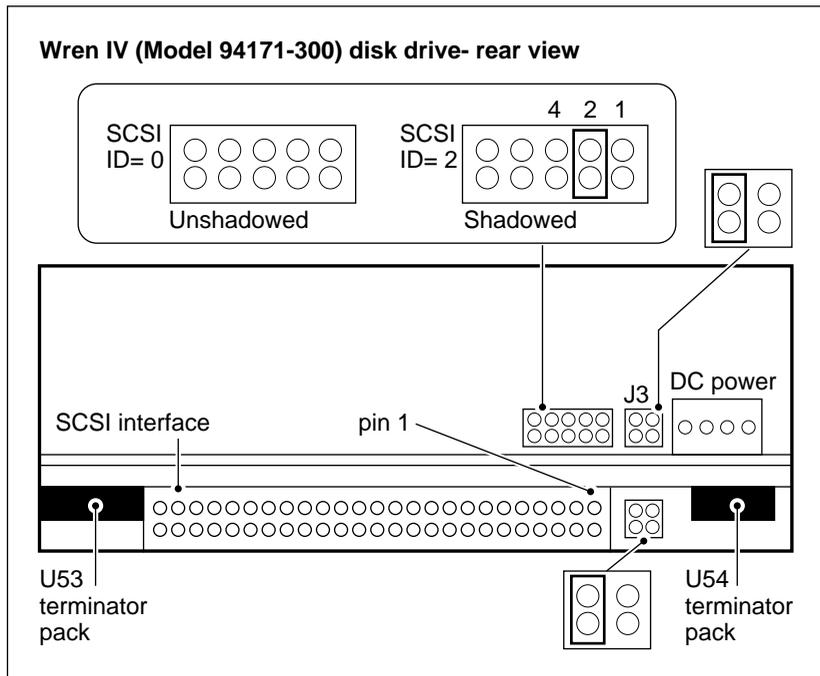


Figure 3-7
300-Mbyte Seagate ST3390N disk drive connectors and jumper settings

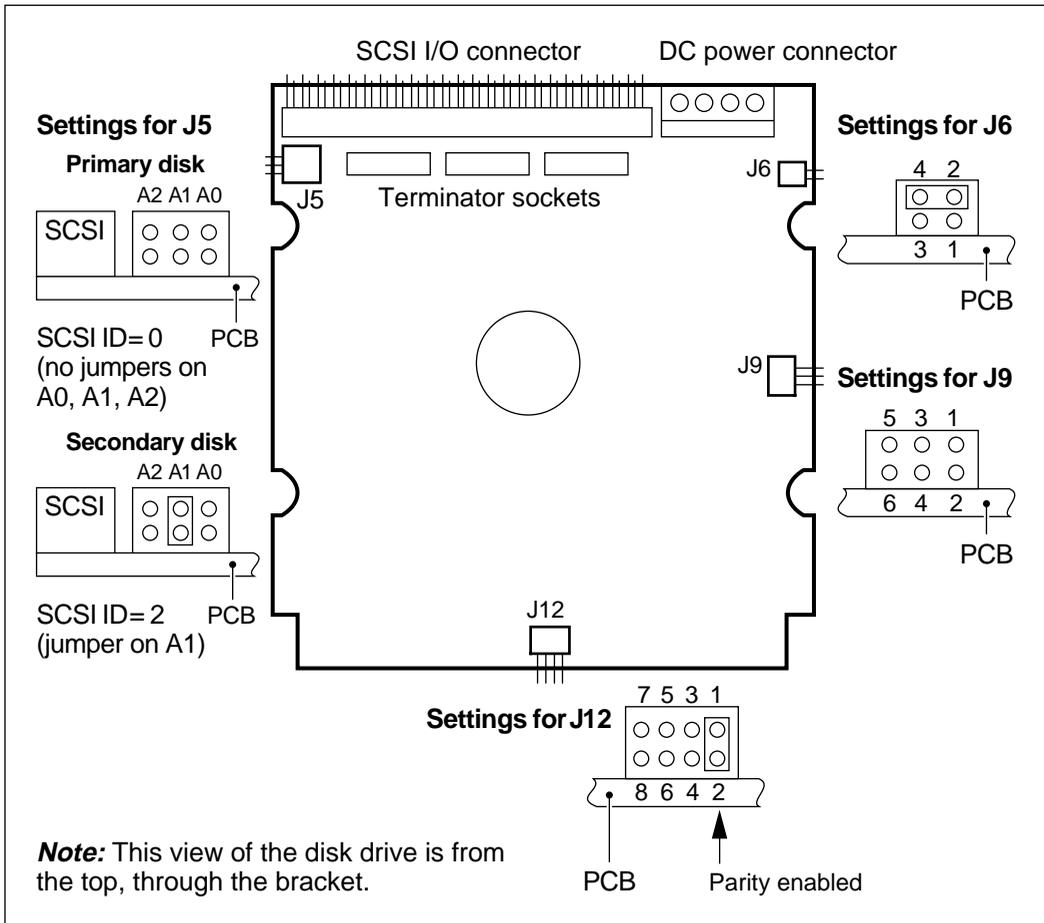


Figure 3-8
300-Mbyte Seagate ST4376N disk drive connectors and jumper settings

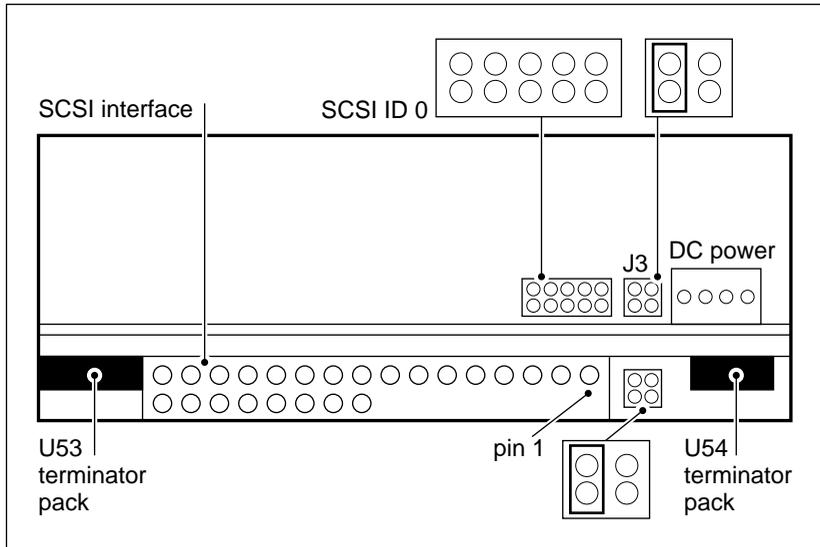


Figure 3-9
600-Mbyte Maxtor disk drive (unshadowed systems only)

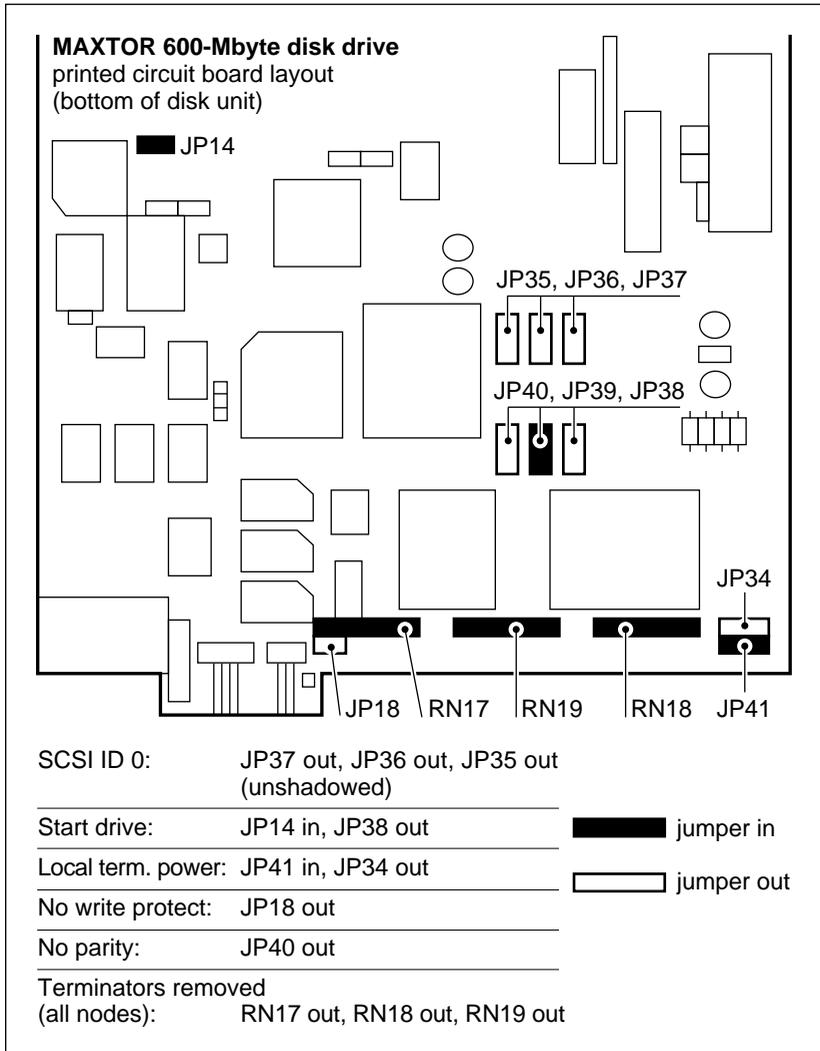


Figure 3-10
1.0-Gbyte Seagate ST11200N or ST31230N disk drive connectors and jumper settings

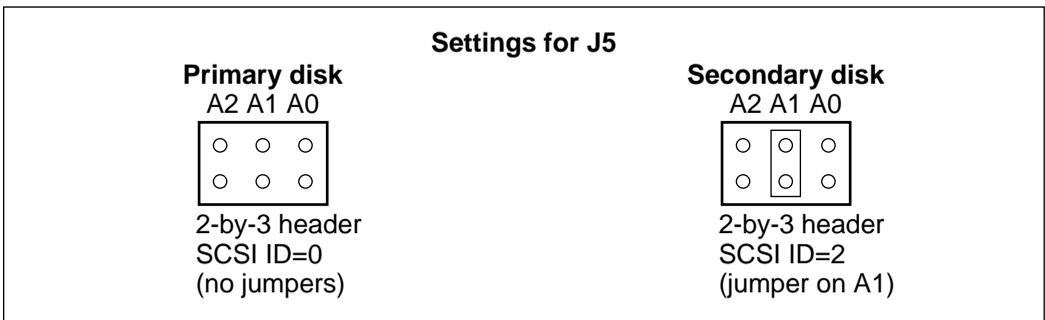
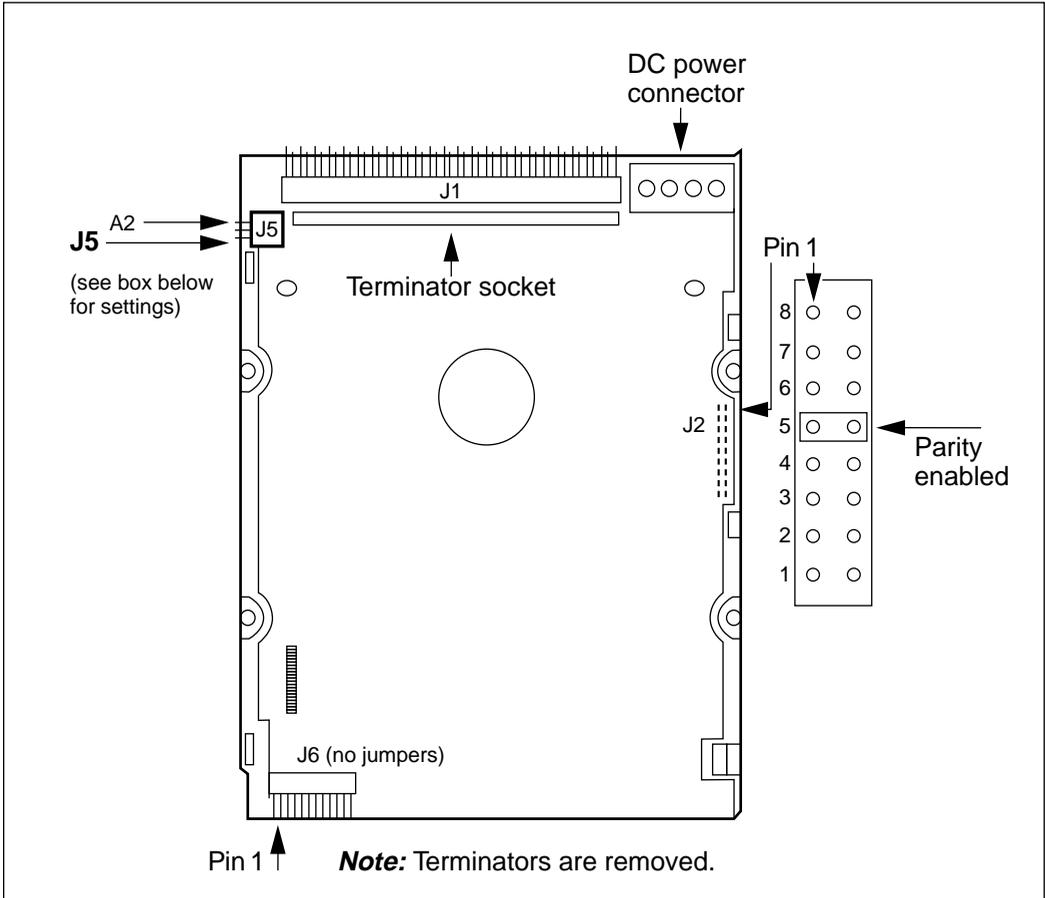


Figure 3-11
1.0-Gbyte Maxtor MXT1240 disk drive connectors and jumper settings

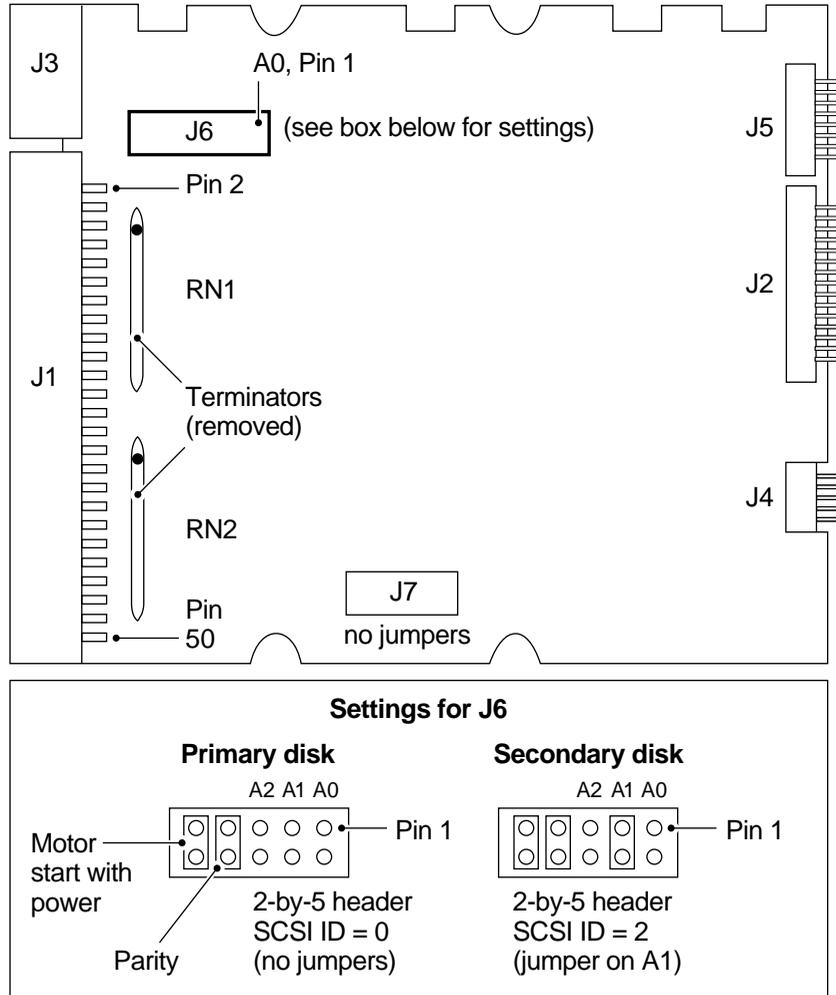


Figure 3-12
DSP3107L disk drive connectors and jumper settings

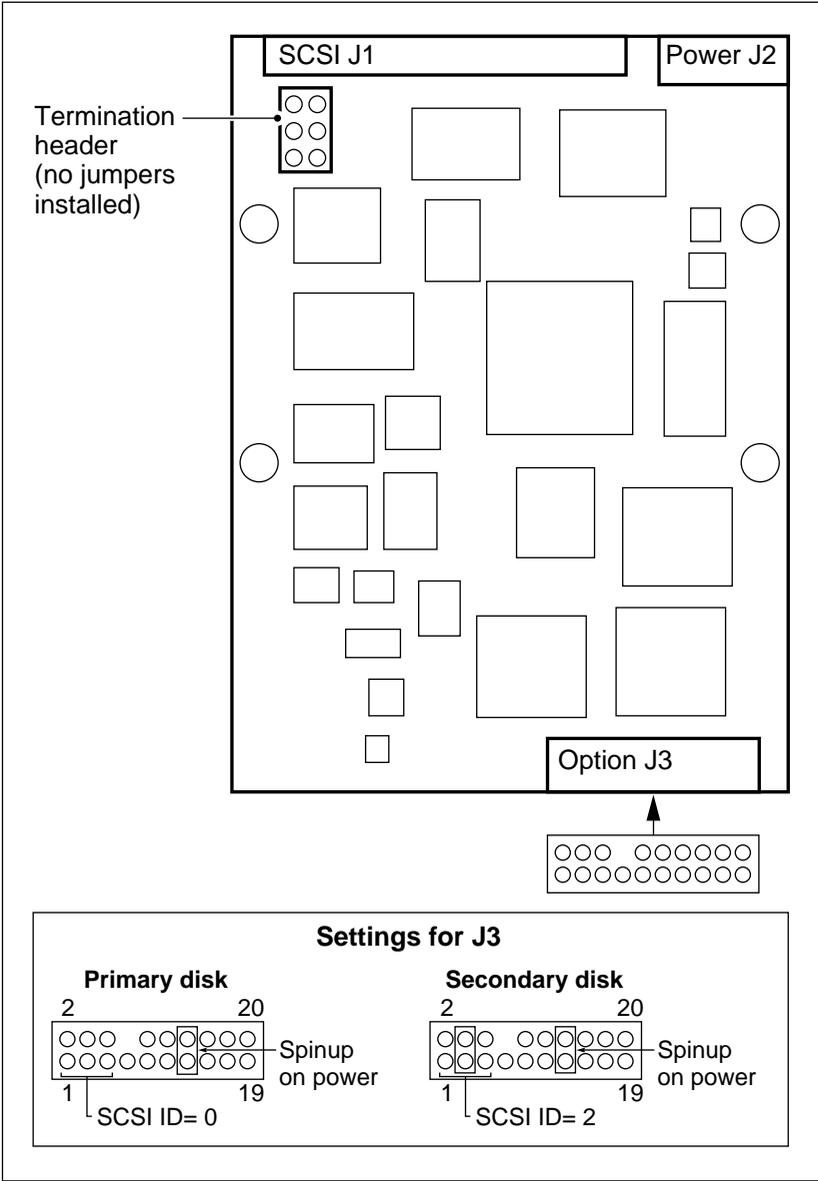


Figure 3-13
Maxtor/Sequel XT8760SH disk drive connectors and jumper settings

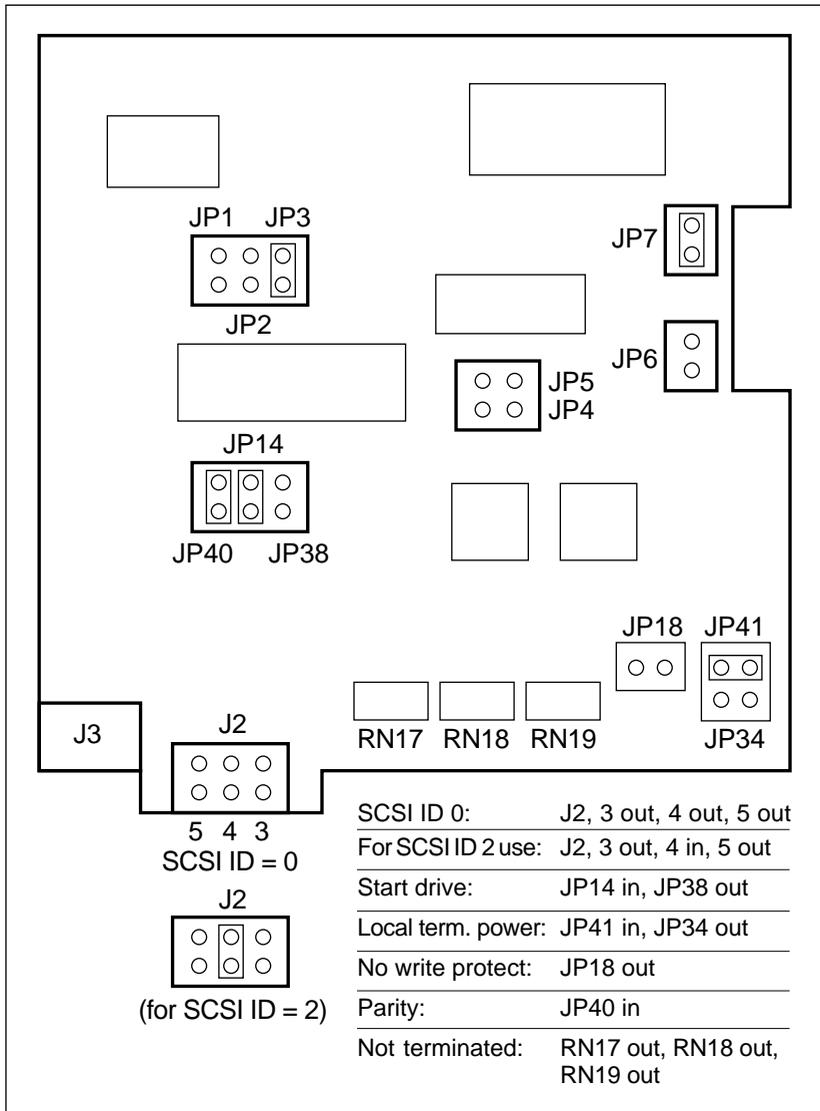
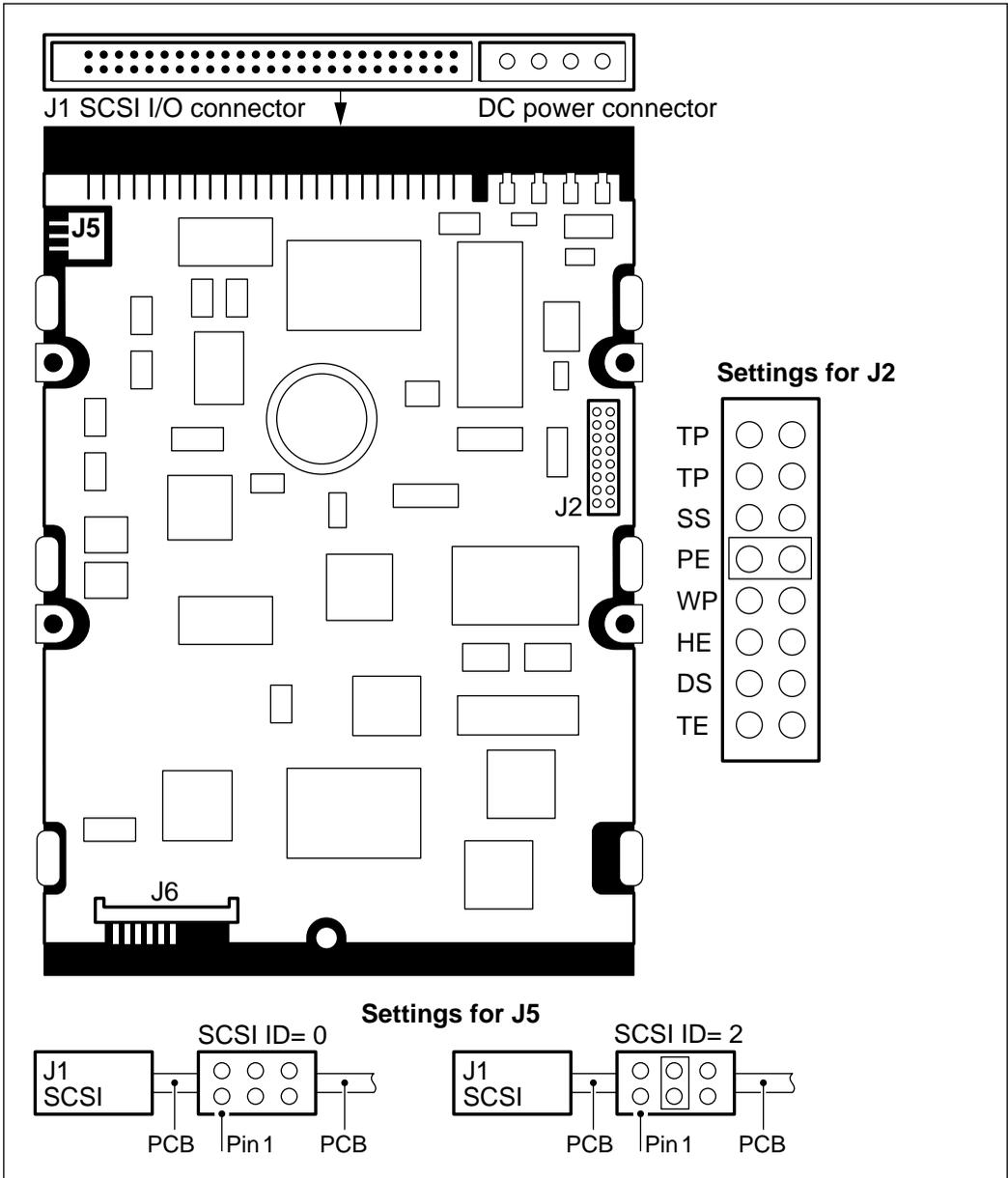


Figure 3-14
Seagate Hawk (ST1120N & ST31230N) disk drive connectors & jumper settings



Tape drive units

The tape unit used with Meridian Mail Options is either the high density 2.5 Gbyte Tandberg TDC4220 tape drive assembly (NT4R28BA) or the Archive Viper tape drive assembly (NT4R28AC).

Table 3-2
Tape drive assemblies

PEC code	Assembly code	Tape assembly
NT4R28BA	A0629941	2.5-Gbyte Tandberg tape drive assembly
NT4R28AC	A0372733	250-Mbyte Archive tape drive assembly

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

Table 3-3
Backup tapes

CPC code	Description of part
A0369779	DC6150 backup tape
A0368760	DC6250 backup tape
A0630697	2.5 Gbyte Magnus backup tape
<i>Note:</i> Either the DC6150 or DC6250 tape is recommended for backup. Using only one type helps to reduce tape drive wear.	
	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.

Installing a mass storage unit

The installation of a mass storage unit (MSU) involves the following :

- setting the SCSI ID of the tape unit
- the actual installation of the MSU

Procedure 3-5**Setting the SCSI ID for the tape drive**

- 1 Find the header beside the SCSI connector.

Archive—this is the 3-by-6 header header beside the SCSI connector. See Figure 3-17 and 3-16 for the header location.

Tandberg—this is the 2-by-10 header beside the SCSI connector. See Figure 3-19 and 3-18 for the header location.

- 2 Set the SCSI ID of the tape drive to 1 as indicated by the figures.

Archive—involves removing any jumpers on the header in positions ID1 and ID2 and inserting a jumper on the header in position ID0 (see Figure 3-17 and 3-16).

Tandberg—involves inserting jumpers on the header in position 0 and parity (see Figure 3-19 and 3-18).

- 3 Ensure that the tape drive terminator resistor packs are removed as indicated in the figures.
- 4 Verify the other jumpers as shown.

Procedure 3-6**Installing the mass storage unit**

- 1 Make sure the power is off for the Meridian Mail Option cabinet.
- 2 Check the jumper settings are correct as per Figure 3-17.
- 3 Make sure no SCSI bus terminator is mounted on the tape drive. (See Figure 3-17.)
- 4 Slowly insert the MSU (See Figure 3-17).
- 5 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 (12V, 5, and ground) of the tape.

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

Note 2: A longer SCSI cable is included because the connector on the Archive 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.

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

Figure 3-15
Archive mass storage unit

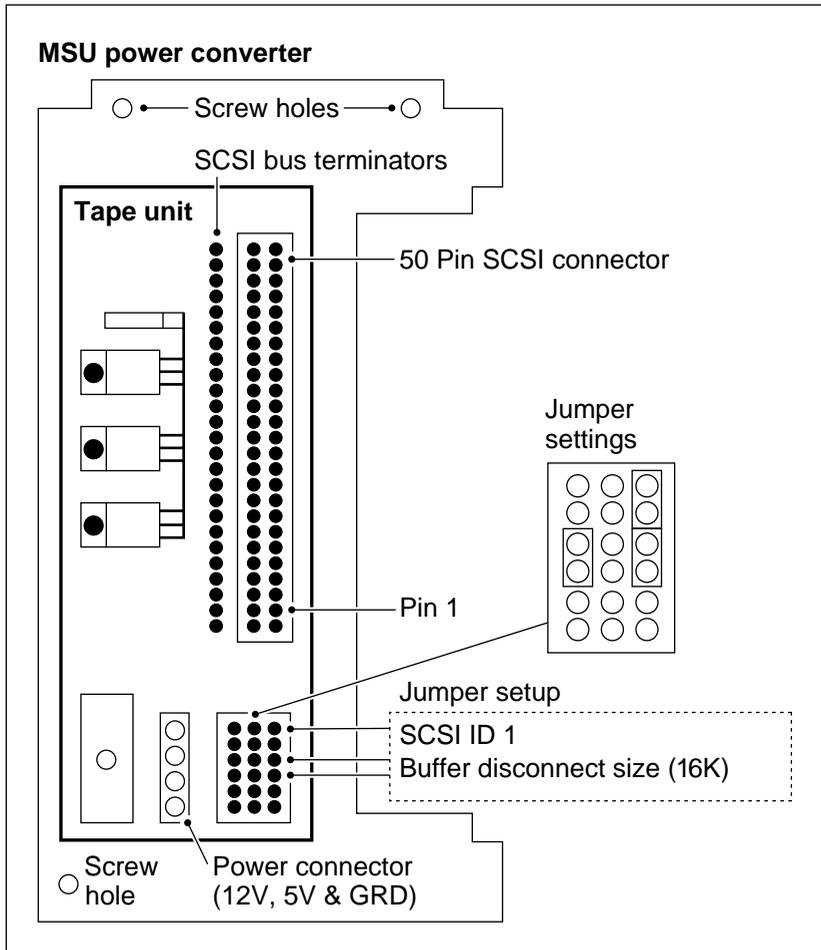


Figure 3-16
Rear of Archive tape drive showing location of SCSI ID

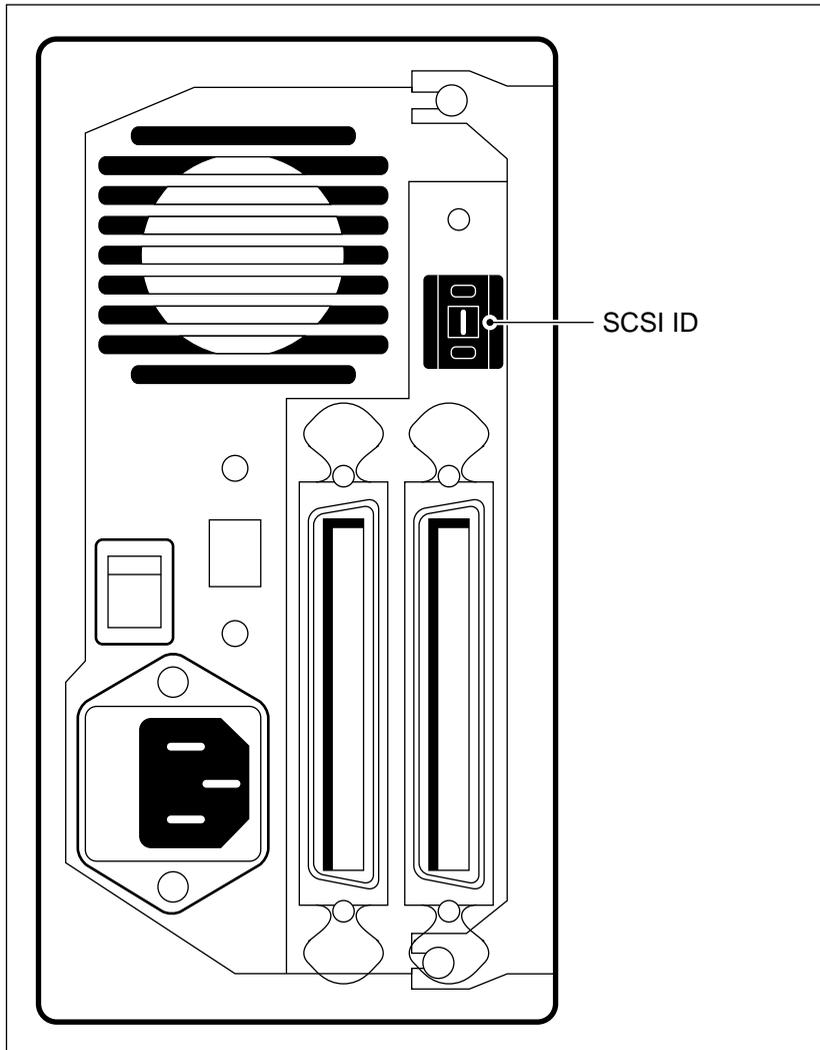


Figure 3-17
Archive tape drive connectors and jumper settings

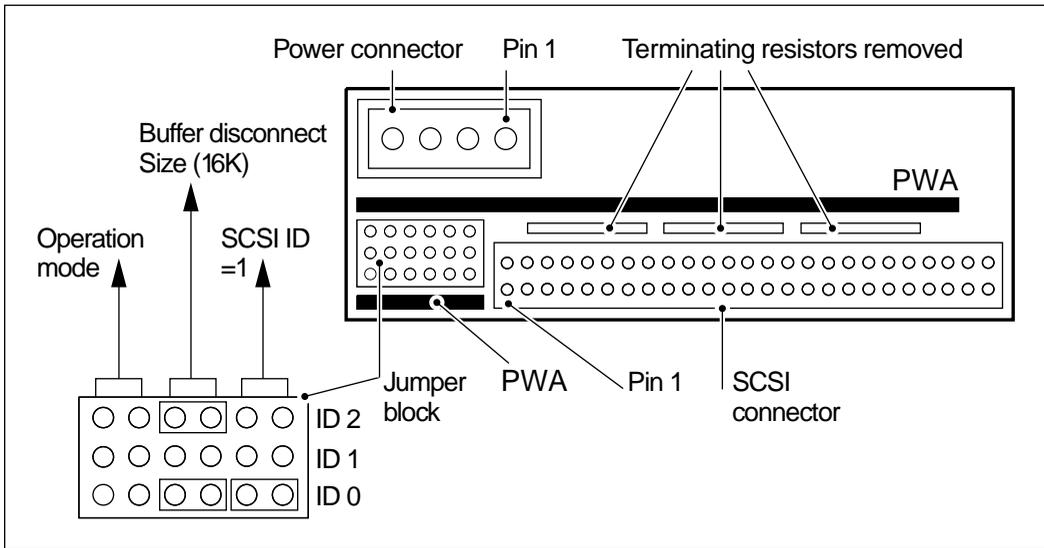
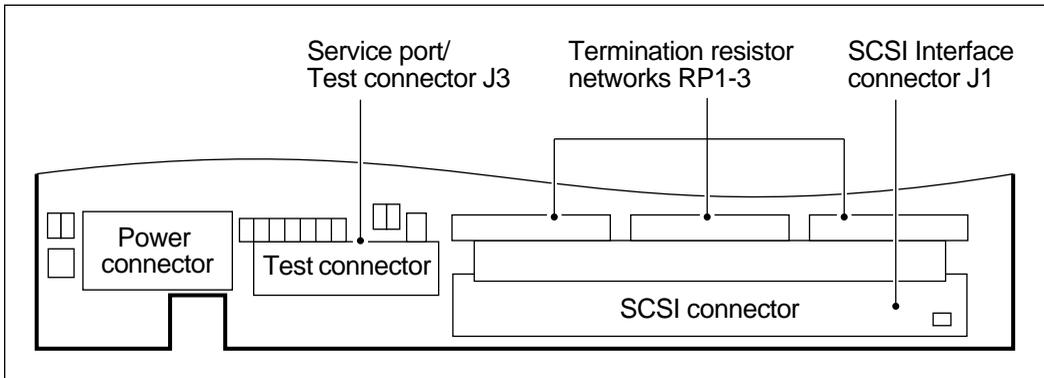
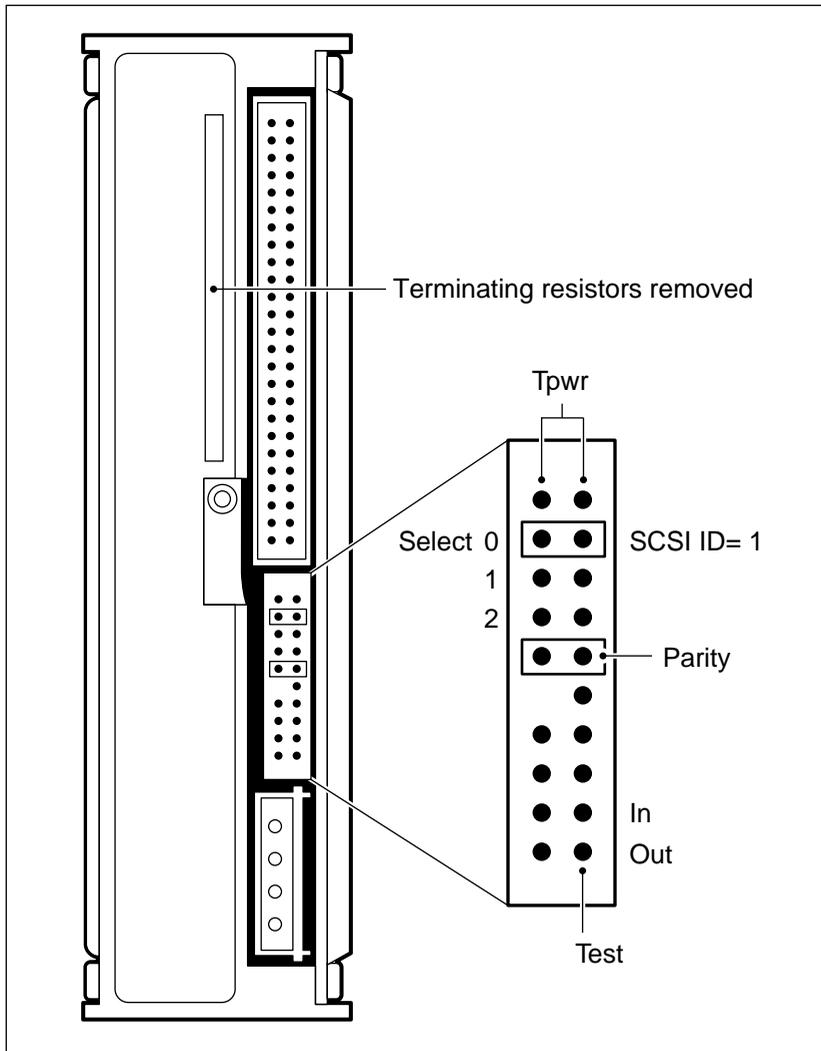


Figure 3-18
Front view of Tandberg tape drive connectors



Note: Terminator resistors are removed.

Figure 3-19
Tandberg tape drive connectors and jumper settings



Maintaining the tape drive unit

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

- Maintain a clean, dust-free environment within the temperature and humidity limits listed in the specifications of the Meridian Mail system.
- Keep all liquids away from the drive and tapes to prevent spills into the equipment.
- Exercise reasonable care when using and storing tape cartridges. Do not place cartridges on the Meridian Mail or Meridian 1 cabinets or the monitor of the system administrator's terminal.
- When a stored tape is moved to an environment with a greatly different temperature, allow the tape to slowly reach room temperature before using it.
- Do not open the cartridge access door to touch the tape.

Cleaning the tape drive

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

The tape cartridge cavity should be cleaned

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

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

- low pressure aerosol air
- tapehead cleaning fluid or reagent grade chemically-pure isopropyl alcohol

- tape drive cleaning kit including a tape drive cleaning cartridge OR tapehead cleaning pads, lint-free cotton swabs, or any industry-acceptable head-cleaning swabs, six inches or longer

Note: If you have a Tandberg tape drive, do not use Procedures 3-7 and 3-8 as they apply only to Archive tape drives.

The tape drive cleaning kits are listed in Table 3-4.

Table 3-4
Tape drive cleaning kits

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

Procedure 3-7
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 3-9.

- 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 3-4.
- 6 Moisten the flexible pad of the cleaning cartridge with 4 drops of the Streaming Tape Head Cleaning Fluid.
- 7 Insert the cleaning cartridge into the tape drive in the same way as a normal tape cartridge and lock into position.
- 8 Move the moistened pad using 4 strokes of the guide rod, moving the rod as far as it will go each time.
- 9 Remove the cleaning cartridge from the tape drive.
- 10 Remove the flexible pad by sliding it out of the holder. Discard the pad.
- 11 Insert a new, dry pad into the holder by sliding it into place.
- 12 Insert the cleaning cartridge into the tape drive and lock into place.

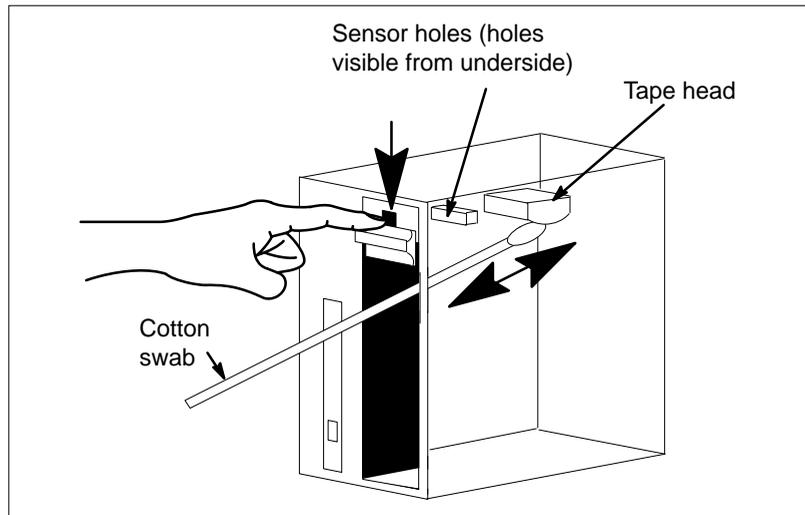
- 13 Move the dry pad using 4 strokes of the guide rod, moving the rod as far as it will go each time.
- 14 Remove the cleaning cartridge. Store it with the dry pad in its original carton until next use.

Procedure 3-8
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 3-9.

- 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 3-20.)
- 4 Moisten a pad or swab with the head-cleaning fluid until it is saturated but not dripping.

Figure 3-20
Archive tape drive cleaning



- 5 Carefully wipe the head in the direction that the tape travels. (Refer to Figure 3-20).

**WARNING****Risk of equipment damage**

Do not wipe perpendicularly or use a circular scrubbing motion as this could seriously damage the tape heads.

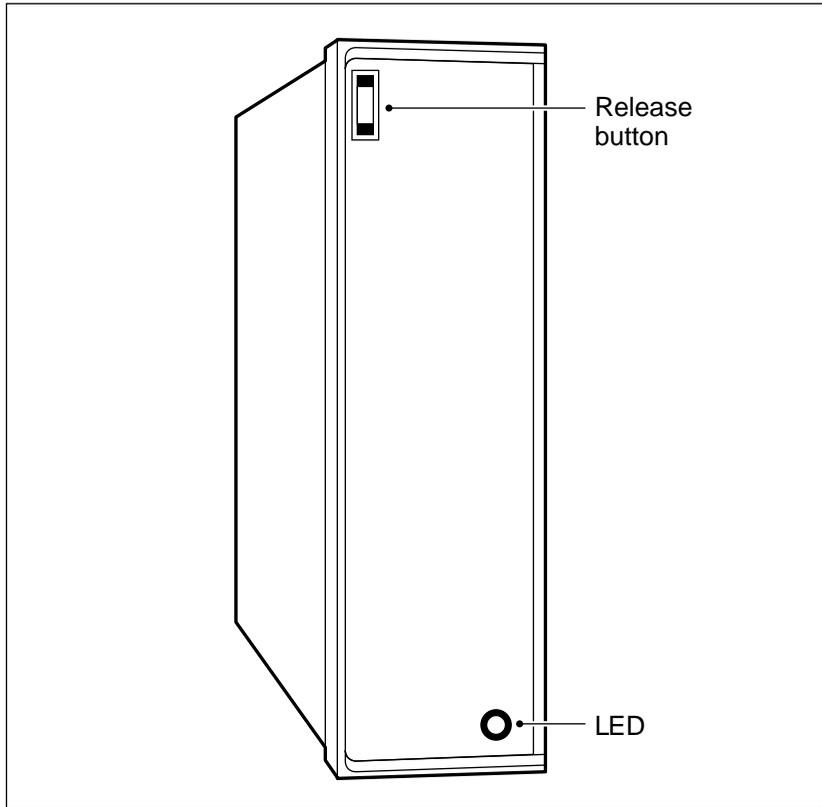
- 6 Discard the used swab and repeat steps 4 and 5 with new swabs until the swab shows no signs of dirt.
- 7 Use a new, dry swab to remove any remaining cleaning fluid from the head.
- 8 Allow 2 minutes for the tape head to dry before inserting a tape.
- 9 Release the head loading lever away from the load position.
- 10 If there was a tape cartridge in the tape drive, reinsert it.

Procedure 3-9**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 3-7 or 3-8.

- 1 Press the release button on the tape drive (see Figure 3-21).
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 spinning.
- 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.

Figure 3-21
Tandberg tape drive



Chapter 4: Common disk subsystem problems

When checking for disk subsystem problems, the following diagnostic checklist should be followed:

- device jumpers
- bus cabling
- disk drive terminators
- power
- tape test
- disk test
- disk problems identified by SEERS

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 standard described in the *Meridian Mail Options Installation Guide* (NTP 555-7011-210).

Bus cabling

A SCSI bus runs from the card cage to the disk and tape drives. Ensure all devices are properly and securely connected.

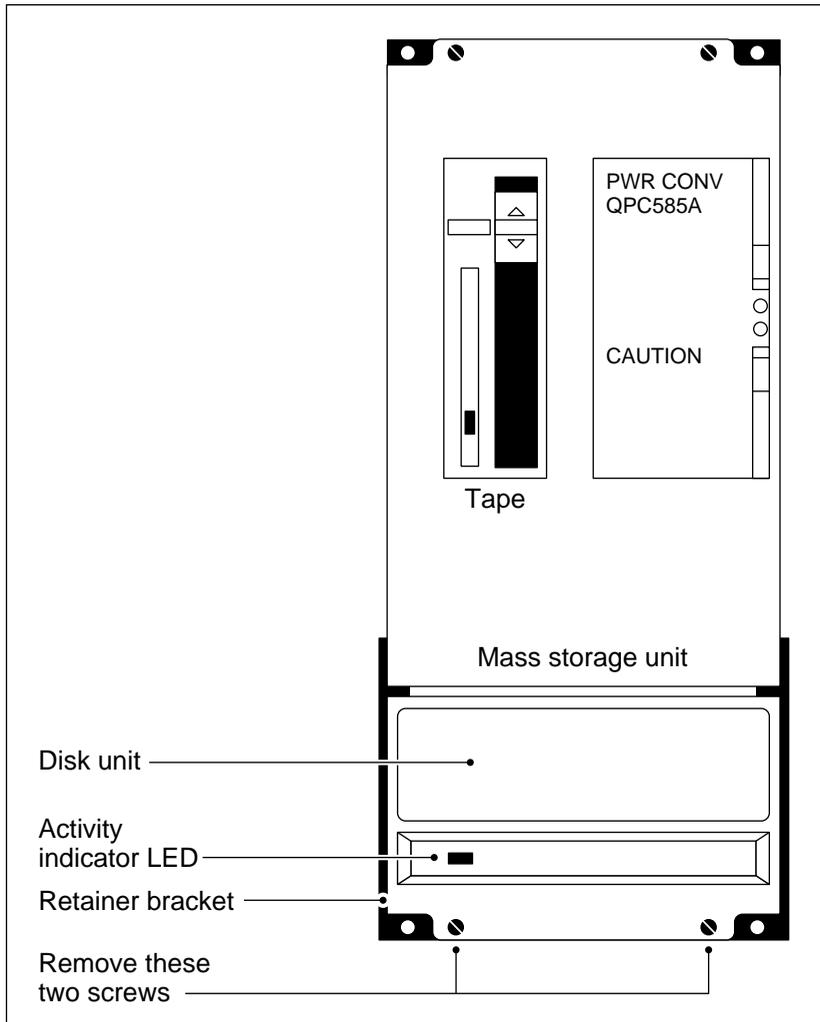
Disk drive terminators

The disk drive must have terminator resistors installed on its circuit board.

Power

Disk and tape drives are fed by a QPC585A DC power converter and may behave erratically when there are power problems. Using Figure 4-1, ensure that the LED on the panel of the converter remains solidly lit.

Figure 4-1
Meridian Mail tape shelf



Tape test

On node 1, a quick sanity check of the SCSI bus can be performed as follows:

- 1 Power on all hardware in the node.
- 2 Put a tape in the tape drive. The device should make a series of clicking noises as it tries to load the tape.

Disk test

To test the disk, perform the following:

- 1 Power on all hardware in the node.
- 2 As power is applied, the disk light comes on briefly and goes off. It should not remain solidly lit.

Disk problems

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) Reference Manual* (NTP 555-7001-510). The purpose of this section is to give further details of the most common ones.

A SEER of 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.

The “sense key” number indicates the type of error as follows:

- 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 of the form

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

is produced when there is a communication problem with the disk.

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

Data loss and disk replacement

When a disk breaks 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, a tape backup should be performed in order to capture as much of the current data as possible.



CAUTION

Risk of data 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 Meridian Mail, such as several corrupted messages or mailboxes, but 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.

- cable connections between the ESDI/MSDL card and the Meridian Mail MMP40 card RS-232 connector
- BootROM messages that appear when Meridian Mail is powered on
- Verify that the option plugs on the ESDI/MSDL card are in the correct sockets.
- Bypass intra-cabinet 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).
- Substitute or 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.

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 set up 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

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, the CMS and ESDI commands are replaced by the following AML commands:

Old Commands

ENL ESDI n
DIS ESDI n
ENL CMS n
DIS CMS n
CON ESDI n
DSC ESDI n
(ESDI card) ACMS n
(MSDL card) ACMS n
SLFT ESDI n
STAT CMS n
STAT ESDI n
SWCH CMS n n

New Commands

use: ENL AML n LYR2
use: DIS AML n LYR2
use: ENL AML n LYR7
use: DIS SML n LYR7
use: EST AML n LYR2
use: RLS AML n LYR2
use: ENL AML n ACMS
use: ENL AML n AUTO
use: SLFT AML n
use: STAT AML n
use: STAT AML n
use: SWCH AML n n

ACMS n

ENL AML n ACMS (ESDI card)

ENL AML n AUTO (MSDL card)

Automatic setup of the AML (ISDN/AP) using 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**DIS AML n LYR2**

Disable AML (ISDN/AP) port number n. This command does not disable the actual ESDI/MSDL port. 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**ENL AML n LYR7**

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**STAT AML n**

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

STAT CMS n**STAT AML n**

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

CON ESDI n**EST AML n LYR2**

Set up the Link Layer (HDLC 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

DIS AML n LYR2

Disable ESDI/MSDL port n. The link layer is disconnected and the ESDI/MSDL will not respond to far-end SABM (HDLC protocol). 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

RLS AML n LYR2

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

ENL ESDI n

ENL AML n LYR2

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

SLFT ESDI n

SLFT AML n

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

STAT ESDI

STAT AML n

Display the status of all ESDI/MSDL ports.

ESDI/AML states

An ESDI/MSDL port may be in one of the states shown in Table 5-1.

Table 5-1
ESDI/AML states

State	Description
DISABLED	The ESDI/MSDL port has been disabled by the DIS ESDI/MSDL command.
ENABLED	The ESDI/MSDL port has been enabled, but the link layer has not been set up by the CON ESDI/MSDL command. The ESDI/MSDL port must be in the ENABLED state to perform the self test.
CONNECTED	The ESDI/MSDL link layer (HDLC protocol) is set up (see CON ESDI/MSDL command), and the port is ready to send and receive messages.
AUTO SET UP	The ESDI/MSDL is attempting to set up the HDLC 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.

The messages listed in Tables 5-2 and 5-3 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 5-2
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 5-3
CSA error messages

CSA 001 n t x	ISDN Applications Protocol Link n cannot be brought up automatically.
x = 1	<p>The ESDI/MSDL is in an invalid state.</p> <p>Actions:</p> <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	<p>ESDI/MSDL Failed the test.</p> <p>Action: Replace the ESDI/MSDL.</p>
x = 8	<p>ESDI/MSDL HDLC link layer setup failed.</p> <p>Actions:</p> <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	<p>ESDI/MSDL is not responding.</p> <p>Actions:</p> <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	<p>No response from Meridian Mail to the ISDN APL polling messages.</p> <p>Actions:</p> <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	<p>The ESDI/MSDL is out of service.</p> <p>Action: Check for ESDA 001 message.</p>
CSA 003 n t	ISDN Applications Protocol Link n is up and active.
CSA 004 n t	ISDN Applications Protocol Link n is up and standing by.

Appendix A: 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 6-1
MMP40 troubleshooting flowcharts

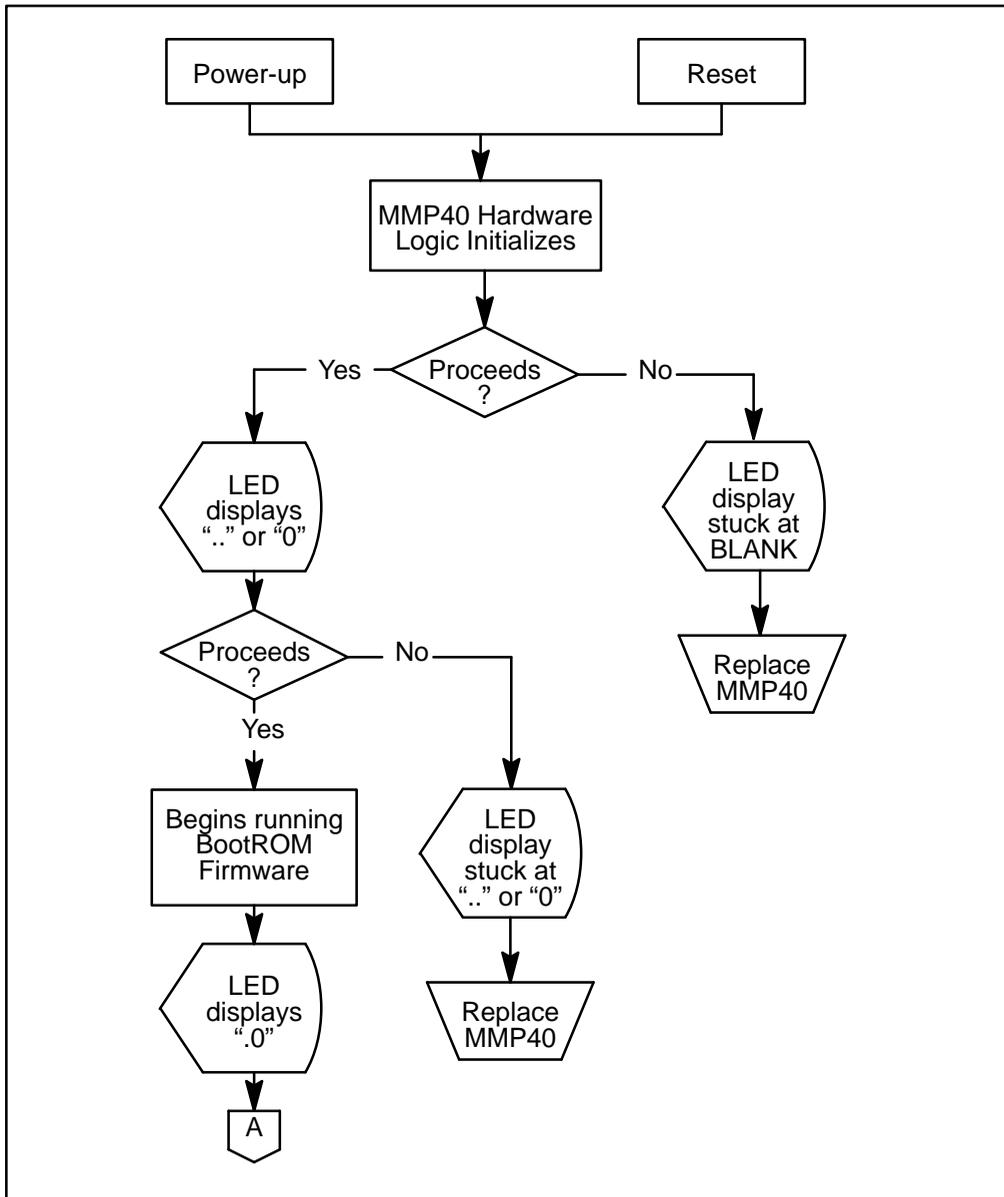


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

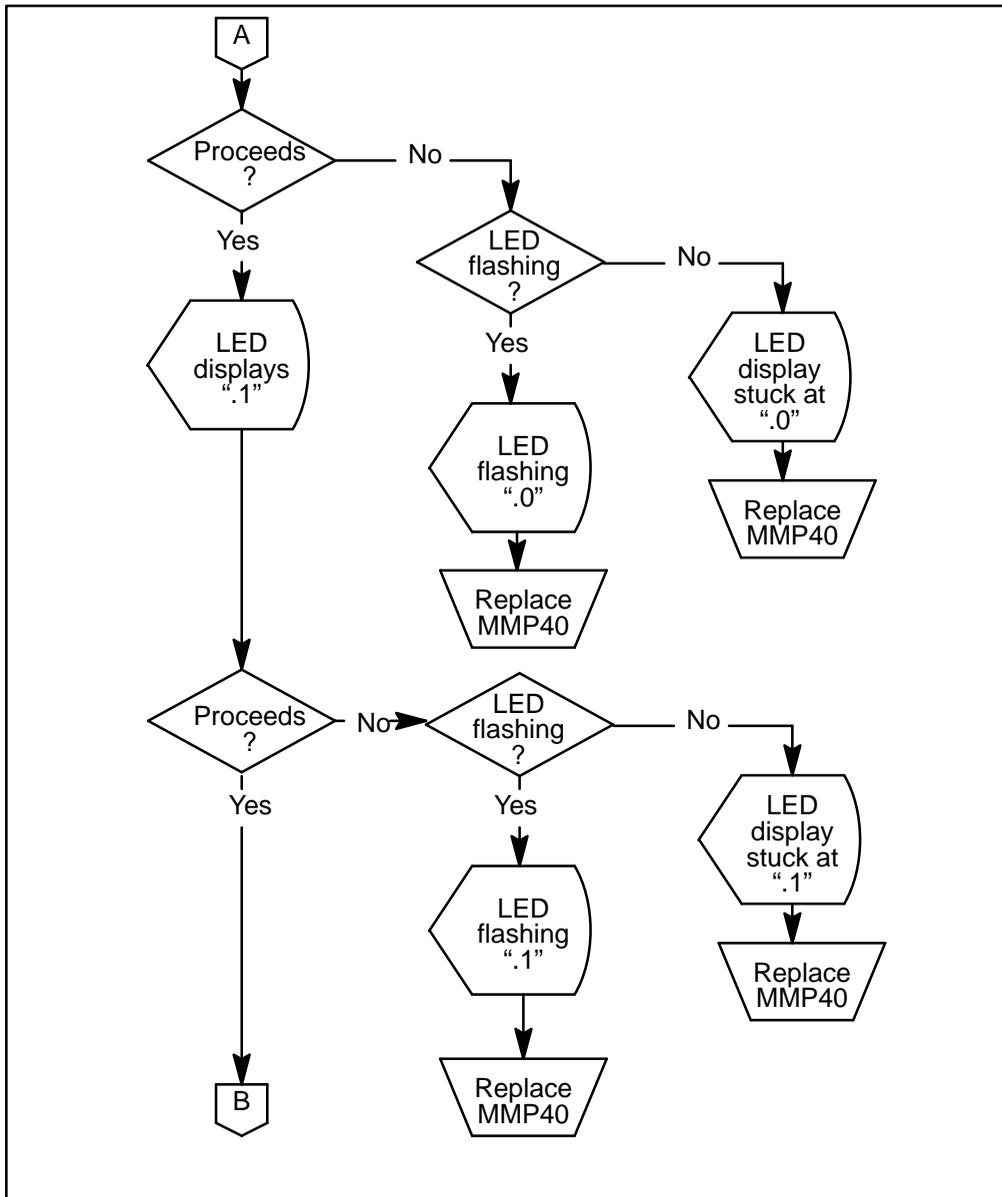


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

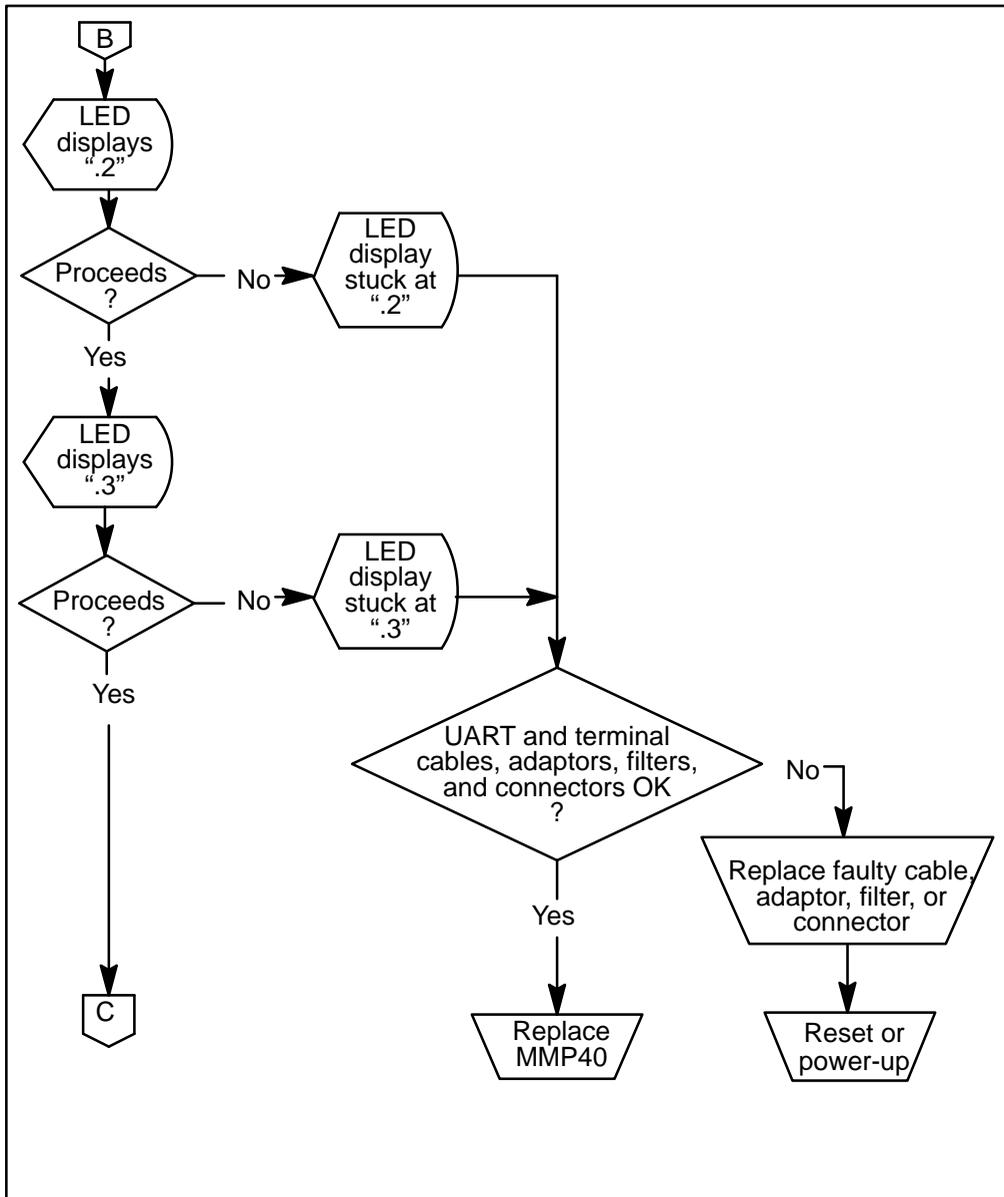


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

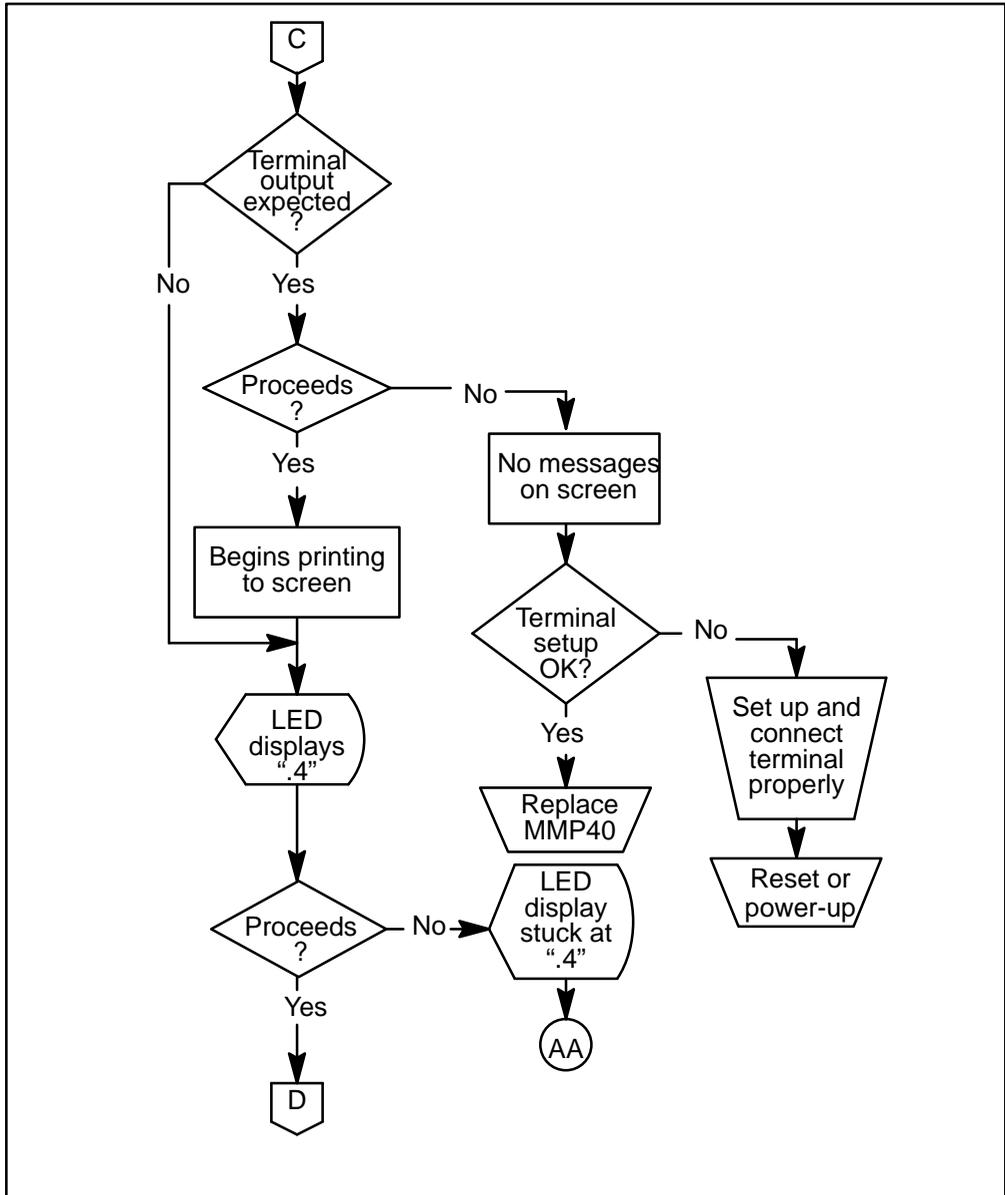


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

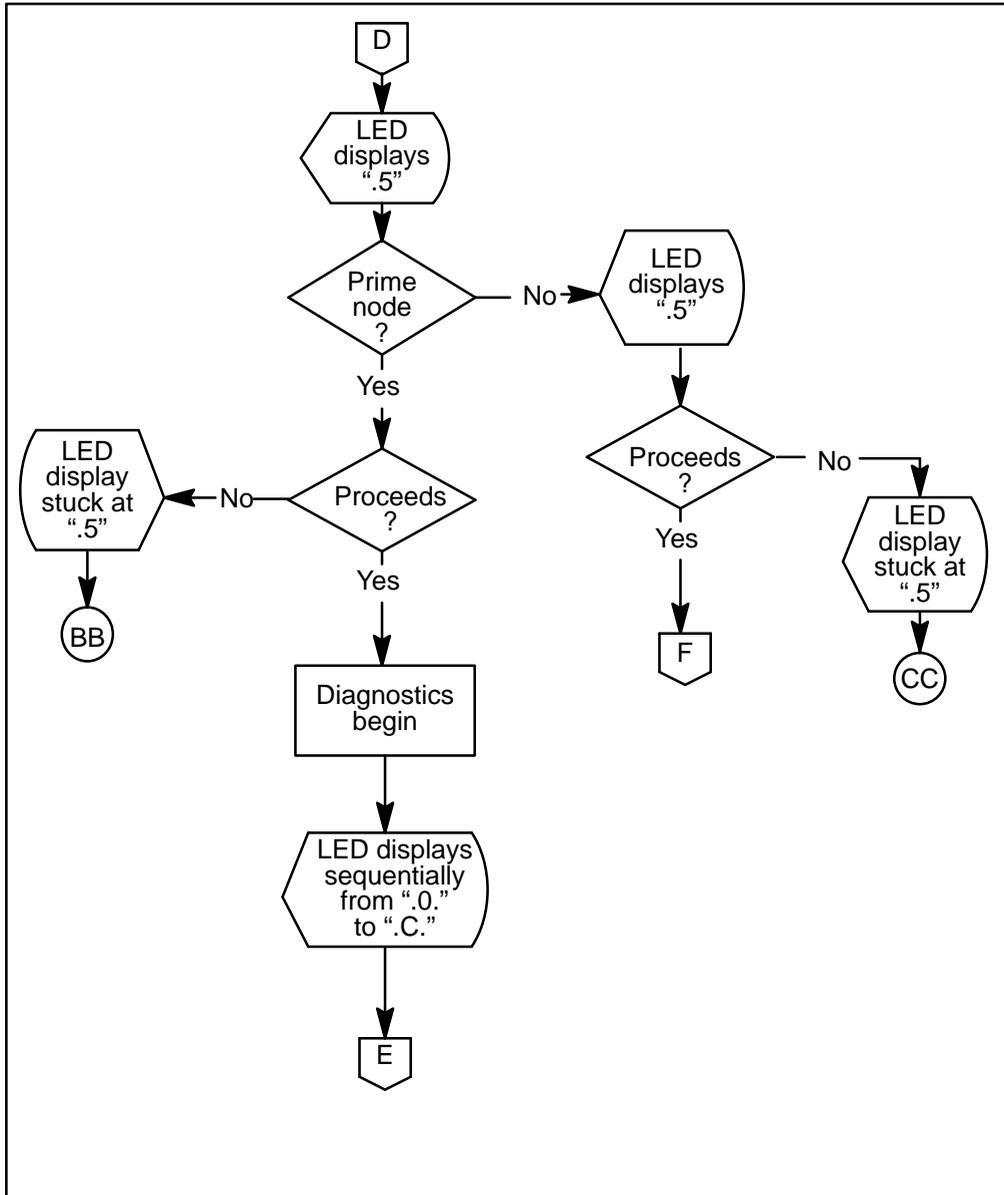


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

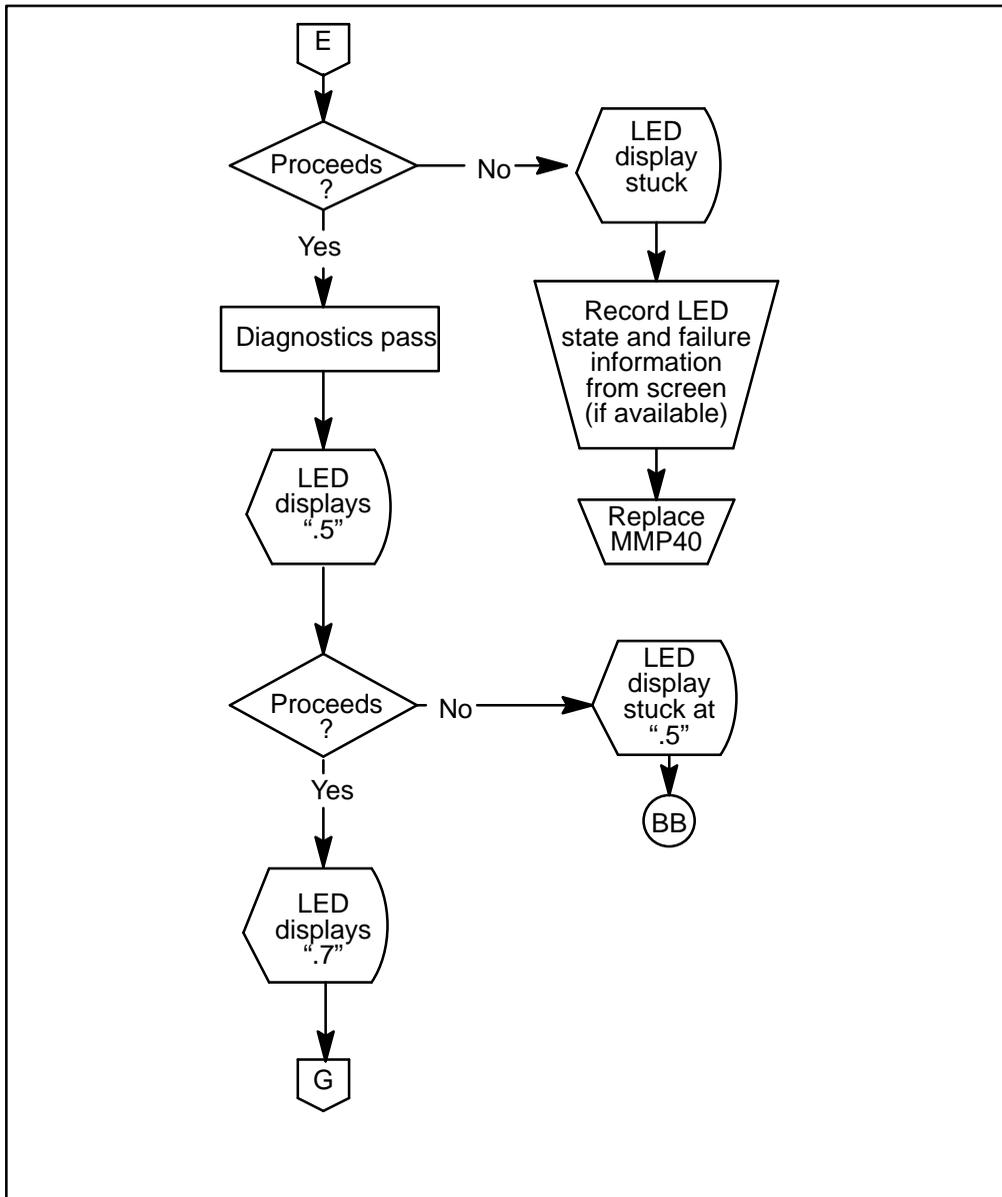


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

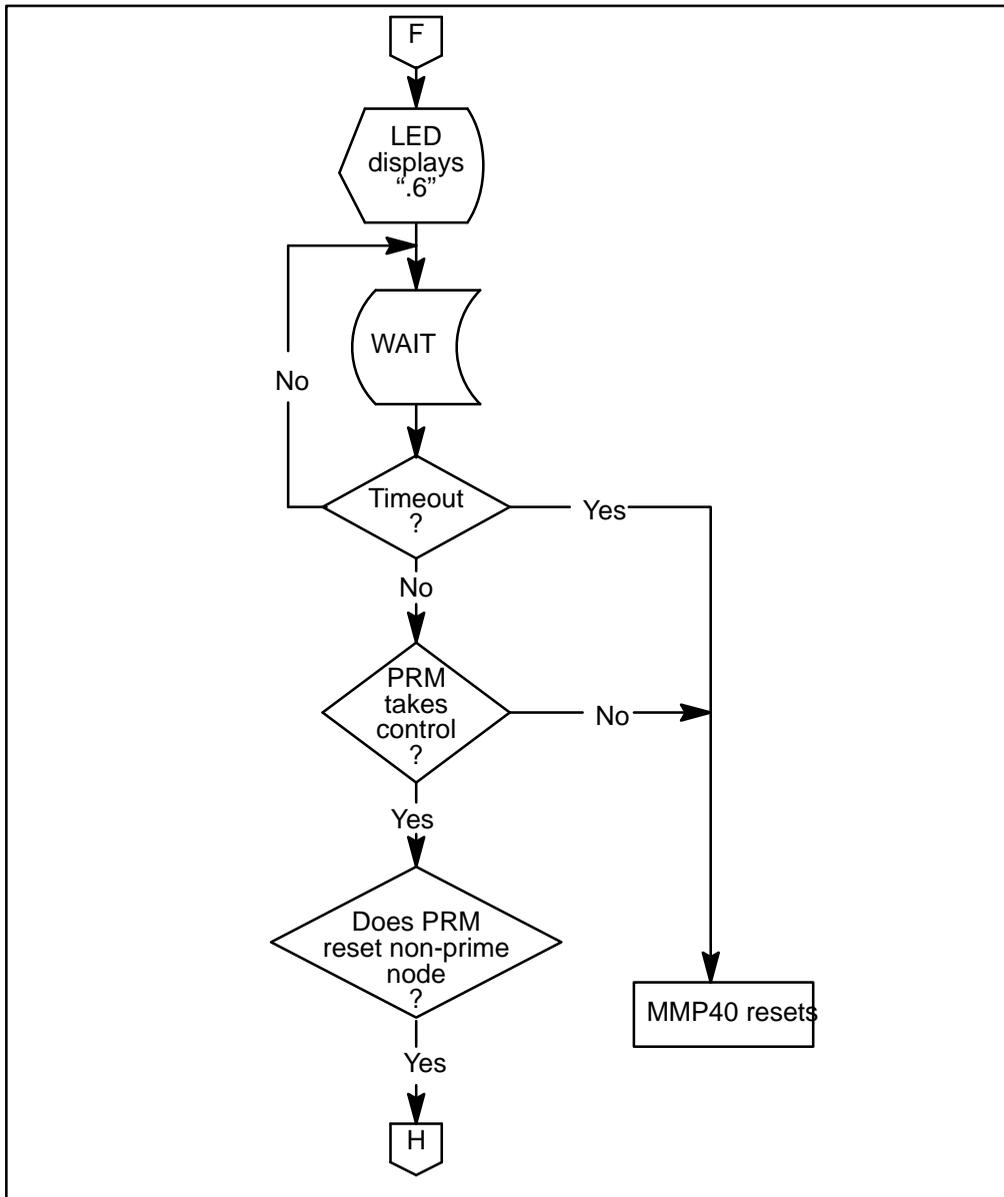


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

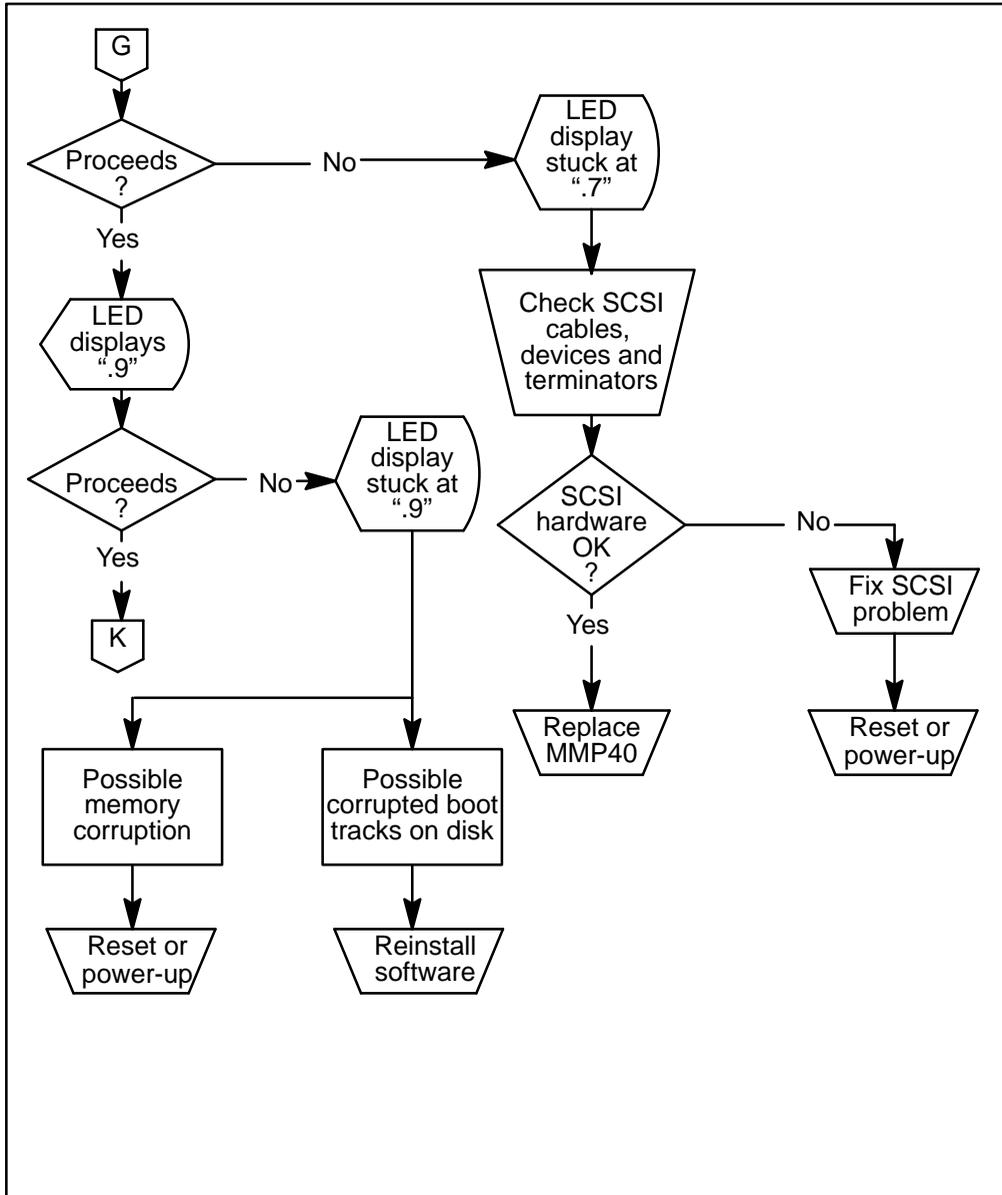


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

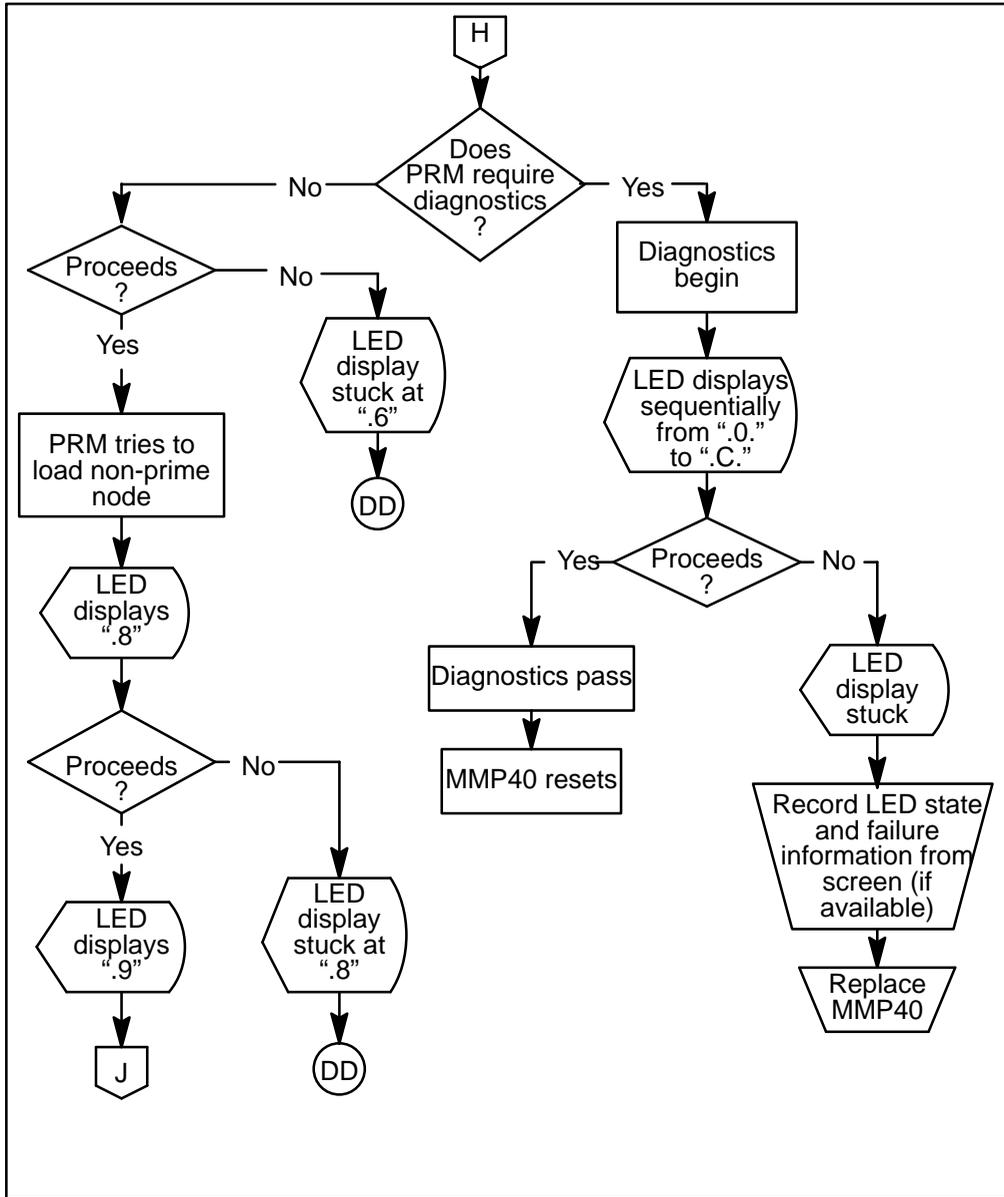


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

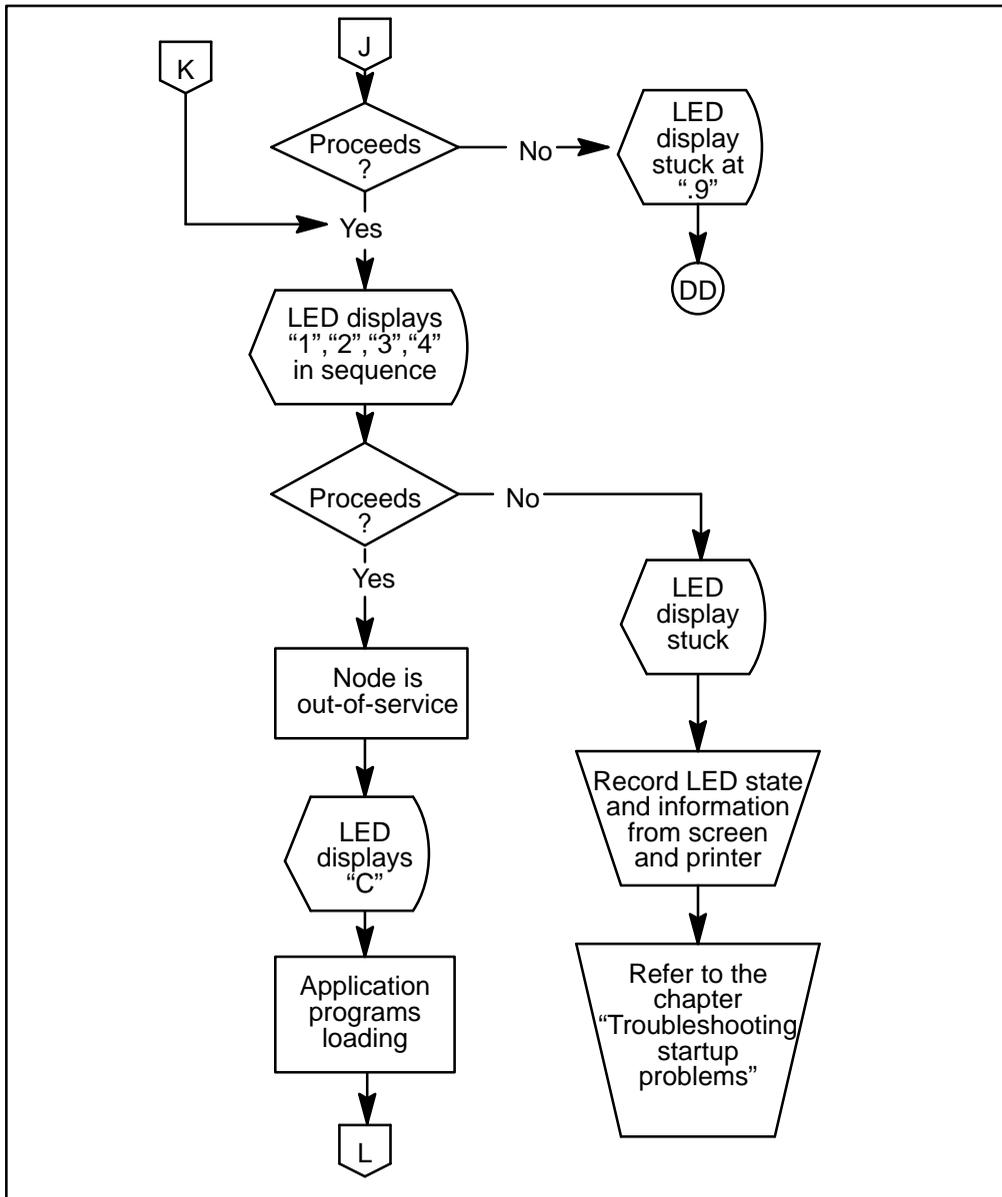


Figure 6-1 (continued)
MMP40 troubleshooting flowcharts

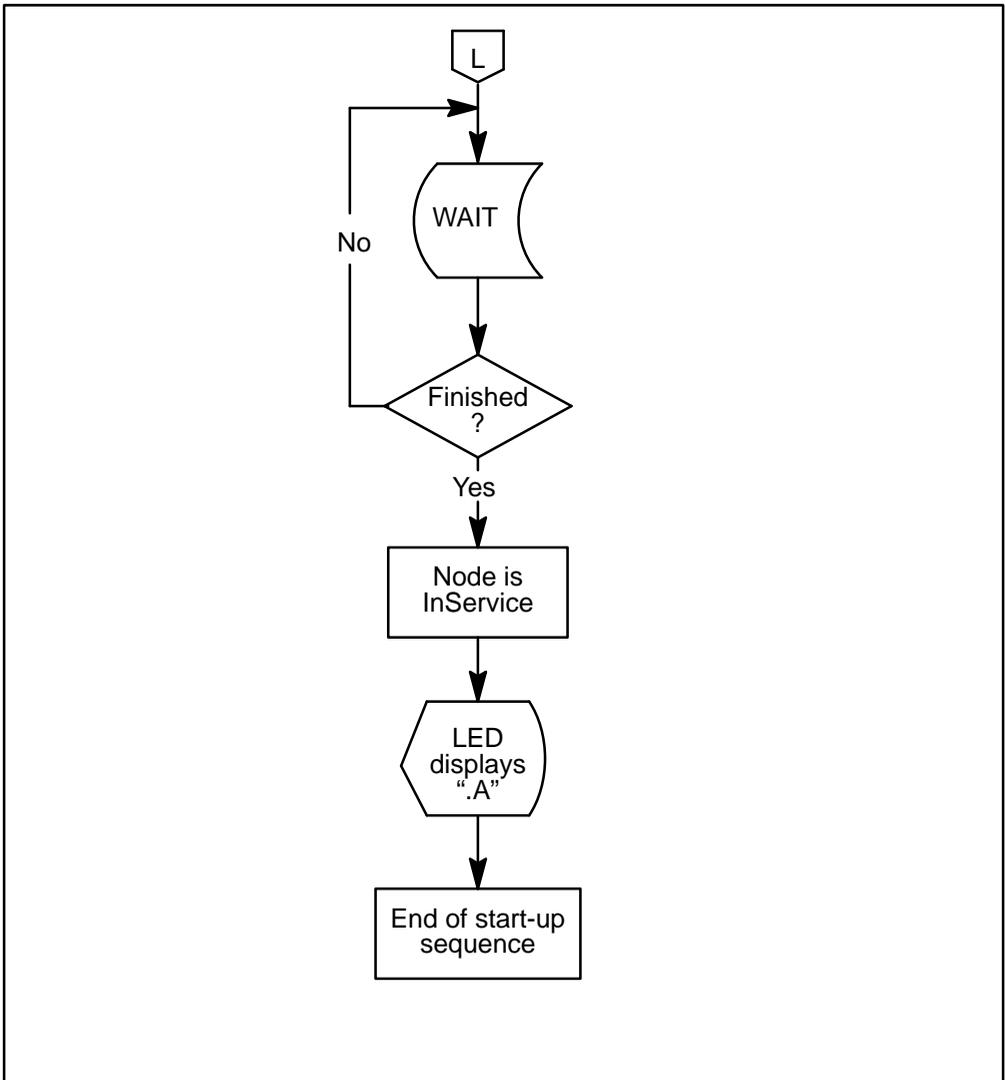


Table 6-1**AA – LED stuck at “.4”**

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 6-2**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 6-3**CC – LED stuck at “.5” (non-prime node)**

Possible Causes	Recovery Action
Ctrl-B or BREAK key was pressed, or terminal was powered up during start-up sequence.	Reset or power-up node again.
No bus clocks.	Check that the utility card is installed.
Prime node powered off, or prime node CPU absent.	Install/power-up prime node.
MMP40 card may be faulty.	Record messages on screen. Replace MMP40 card.

Table 6-4
DD – LED stuck at “.6”, “.8”, or “.9” (non-prime node)

Possible Causes	Recovery Action
Prime node MMP40 may be faulty.	Record LED state and any SEERs. Replace prime node MMP40.
MMP40 card on non–prime node may be faulty.	Record LED state and any SEERs. Replace non-prime node MMP40.
Utility card may be faulty.	Replace faulty card.

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Reader's Response Form
for
Meridian Mail Options
Maintenance Procedures (NTP 555-7011-500)
August 1995

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NORTEL

Reader's Response Form

Meridian Mail Options

Maintenance Procedures

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Publication number: 555-7011-500
Product release: 10.0
Document release: Standard 1.0
Date: August 1995

Printed in the United States of America

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