Meridian Mail Modular Option EC
Installation and Maintenance Guide

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Meridian Mail Modular Option EC
Installation and Maintenance Guide

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Publication history

November 1999	*Modular Option EC Installation and Maintenance Guide* is released as Standard 1.0.This manual documents installation and maintenance procedures for Meridian Mail Release 13 on the Modular Option EC hardware platform. The Enhanced MMP40 card is introduced as the replacement for the previous MMP40 card.This release makes all earlier editions obsolete.
January 1998	*Modular Option EC Installation and Maintenance Guide* is released as Standard 1.0. This manual documents installation and maintenance procedures for Meridian Mail Release 12 on the Modular Option EC hardware platform. This release makes all earlier editions obsolete.
November 1996	*Modular Option EC Installation and Maintenance Guide* is released as Standard 1.0. This manual documents installation and maintenance procedures for Meridian Mail Release 11 on the Modular Option EC hardware platform. This release makes all earlier editions obsolete.
August 1995	*Modular Option EC Installation and Maintenance Guide* is released as Standard 1.0. This manual documents installation and maintenance procedures for Meridian Mail Release 10 on the Modular Option EC hardware platform. This release makes all earlier editions obsolete.
April 1995	*Modular Option EC Installation and Maintenance Guide* is released as Standard 1.0. This manual documents installation and maintenance procedures for the Meridian Mail Release 9.5 on the Modular Option EC hardware platform.
	Modular Option EC Installation and Maintenance Guide consolidates and replaces the March 1994 Standard 1.0 version of the *Installation Guide* (NTP 555-7061-210) and *Maintenance Procedures* (NTP 555-7061-500) for the Modular Option EC Release 9.0.

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Preface

About this guide

In this chapter

Overview

Introduction   This document describes installation and maintenance
                            procedures for the technician who installs Meridian Mail and
                            for the individual who is responsible for Meridian Mail system
                            administration and maintenance.

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

                            •   do not have Meridian Mail, or

                            •   have Meridian Mail and are adding one or more nodes, or

                            •   are troubleshooting a problem with a Meridian Mail system

Installation section   The installation section of this guide describes the following
                            procedures:

                            •   how to install and configure a Meridian Mail system

                            •   how to connect cables between the switch and Meridian
                                 Mail

                            •   how to program the switch to communicate with Meridian
                                 Mail

                            The installation section also shows you how to expand a
                            Meridian Mail system; how to program the switch to recognize
                            the newly added loops or ports, or both; and how to
                            communicate command and status information to Meridian
                            Mail.

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

**Hardware   The "Hardware maintenance" chapter describes how to repair or
maintenance**   replace a faulty hardware part. This document covers only parts
                            that can be replaced in the field. These parts include the
                            following:

                            •   printed circuit packs (PCPs)

                            •   module power supplies

                            •   hard disk subsystems

- cartridge tape units

This manual does not cover the following parts, which are repaired in the factory:

- Meridian Mail backplane assembly
- cable harnesses

Administration Guide references

Introduction   For references to the *System Administration Guide*, refer to the
following list to find the version of the NTP (as identified by the
NTP number) that applies to the system you are working on:

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

Chapter 1

Introduction to Meridian Mail Modular Option EC

In this chapter

Overview

Introduction

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

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

Supported system configuration

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

Platform migration and release conversion

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

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

Converting from an existing Modular Option EC system

Introduction

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

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

Tandberg tape drives are available (but not mandatory) for Release 13. They provide greatly enhanced speed and storage capacity. The Archive Viper tape drives are still supported, but if you decide to use the new Tandberg drive, refer to Chapter 7, "Installing the disk drives and tape drive," for replacement instructions.

Before you begin the system installation and modification procedures, unpack and inspect the new hardware as described in Chapter 4, "Unpacking and inspecting the equipment." Then refer to the *System Installation and Modification Guide* to begin the conversion to Release 13. When the *System Installation and Modification Guide* instructs you to "install the new hardware," refer to Chapter 15, "Converting from an existing Modular Option EC system to Release 13," for instructions.

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

Node expansion on an existing system

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

Modification Guide refers back to this manual for hardware installation information.

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

Hardware

Introduction

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

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

Hardware

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

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

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

Hardware configurations

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

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

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

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

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

Every node is equipped with

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

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

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

Enhanced MMP40 card

The Enhanced MMP40 card has the following capabilities:

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

Switch requirements

Switch software requirements

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

The following packages must be present in the X11 software:

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

Switch hardware requirements

The minimum switch hardware requirements for Meridian Mail Modular Option EC are

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

Chapter 2

Preparing for installation

In this chapter

Overview

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

Tools required

Introduction   The following table lists the tools required for installation.

Tool	Description
antistatic wrist strap	
BIX connector tool	NT product number GYBIX16
carpenter's level	
extraction tool	P0741489
hammer	
Phillips screwdriver	small, medium
slotted screwdriver	small, large
socket wrenches	1/4, 5/16, and 9/16 inch
volt meter	
wire cutters	
wire strippers	
flashlight	

Reference documents

Introduction   Installation procedures for some of the components of this
system require additional documentation.

The following table lists documents referenced for installation
procedures in this manual.

Reference document name	NTP number
SL-1 Features and Services Practice	553-2301-105
SL-1 Maintenance Manual	553-2301-511
NT6D82 Power System; Description, installation, and maintenance	553-3001-110
SL-1 System Installation Planning	553-3001-120
SL-1 System Installation Procedures	553-3001-210
Circuit Card Installation and Testing	553-3001-211
X11 Input/Output Guide	553-3001-400
NTP Contents Overview	555-7001-000
System Installation and Modification Guide	555-7001-215
Meridian Mail System Administration Guide *Meridian Mail System Administration Guide for Multi-Customer Systems*	555-7001-301 555-7001-302
System Administration Tools	555-7001-305
Meridian Mail Maintenance Messages (SEERS) Guide	555-7001-510
Meridian Mail Modular Option EC Site and Installation Planning Guide	555-7061-200
Note: The SL-1 switch documents referenced above apply to the Meridian 1 switch, since the switches are basically the same.	

Chapter 3

Assembly overview

In this chapter

Overview

Introduction   This chapter summarizes the steps required to install a Meridian Mail Modular Option EC. If you must add nodes to expand an existing system, see Chapter 14, "Adding a node."

You must install hardware in the proper order. The chapters in this document are arranged in the order in which you install hardware components. When you finish the installation steps in one chapter, simply continue with the next chapter.

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

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

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

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

> **DANGER**
> **Risk of electrocution**
>
> When you need to make connections at an electrical service panel, Nortel Networks requires that a licensed electrician make those connections.

Installation tasks

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

To	see chapter
unpack and inspect the equipment	4
install Meridian Mail columns, including power and grounding, and earthquake protection. Install Meridian Mail modules (if necessary)	5
install power supplies	6
install disk drives and the tape drive	7
configure the backplane and inspect printed circuit packs	8
install intramodule and intermodule cables	9
install, cable, and configure peripheral devices	10
install the Meridian Mail to PBX interface	11
configure the Meridian 1	12
start up, configure, and acceptance test Meridian Mail	13

Chapter 4

Unpacking and inspecting the equipment

In this chapter

Overview

Introduction   This procedure gives the steps required to unpack and inspect
                                the Modular Option EC equipment. Follow this procedure to
                                ensure that all the components are present and that the
                                equipment is placed in an appropriate location.

CAUTION
Risk of equipment damage

Wear an antistatic wrist strap when you
handle components. As an additional
safety measure, handle each component by
the edges and, whenever possible, with the
loosened packing material still around it.

Unpacking and inspecting

Introduction

To unpack and inspect the equipment, follow these steps.

Step	Action
1	If the equipment is mounted on a shipping pallet, follow the unpacking instructions provided with the packaging material and remove the equipment from the pallet.
2	Cut any remaining strapping or tape.
3	Remove the transport protection devices and loosen any stretch-wrap film from the equipment.
	You can remove the stretch-wrap film 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 you need to return any equipment.
4	Check all items delivered against the order form and the packing slip.
	Report any errors or omissions to your supplier.
	See Appendix A in the *Site and Installation Planning Guide* (NTP 555-7061-200) for a list of part numbers.
5	Remove all hardware components that were shipped in separate boxes and check for loose parts, broken edges, and any other obvious damage to the components.
	Components that are usually shipped in separate boxes include documentation, disk and tape units, power supply, cables, administration terminals, printer, and spares.
6	Place the equipment, unpacked, in a safe, dry area in the equipment room, close to its final location.
7	Repack the hardware components in their boxes until you are ready to install the system.

Step	Action
8	Remove the preinstalled printed circuit packs (PCPs) from the shelf, following "Removing and reinstalling printed circuit packs" on page 4-5, and check for any loose parts, broken edges, and any other obvious damage to the component.
9	Inspect the remaining equipment for the following problems: • damaged connectors or connectors that contain foreign material • defects in the molded plastic covers • any obvious damage to the equipment
10	Use a flashlight to make sure that there are no broken pins or shrouds on the backplane connectors. Report any damage or defects to the supplier.

Removing and reinstalling printed circuit packs

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

Step	Action
1	Open the ejectors on the card and gently pull the card toward you until it clears the shelf.
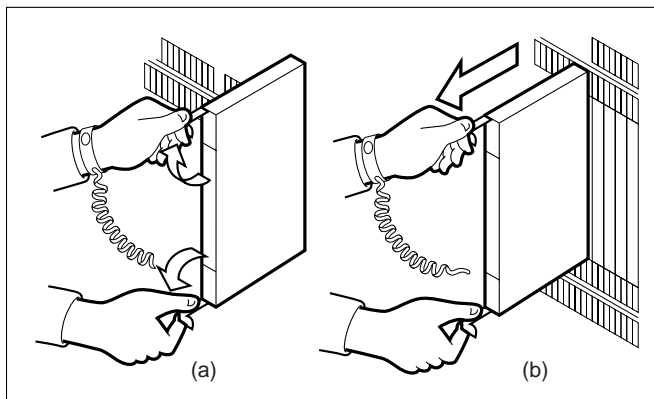
G100044

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

Step	Action
2	Check the card to make sure that it is not bent and there are no loose parts.
3	If you are not reinstalling the card immediately, place the card in an electrostatic discharge (ESD) protective container and place it in a safe location.
4	Reseat the card in the module: align it with the slots in the module with the ejectors still in the open position, and then gently slide the card back into the module.
5	Seat and lock the card as follows:
	a. Push the upper and lower edges of the faceplate to ensure that the card is fully seated in the module.
	b. Close the ejectors.

PCP removal
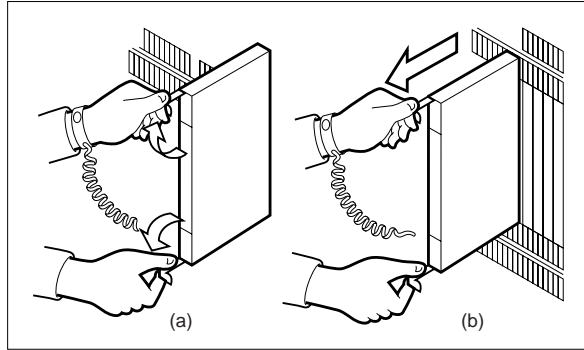
G100044

Chapter 5

Installing a column or module

In this chapter

Overview

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

The procedures you need to follow depend on whether you plan
to install a new column or add modules to a new or existing
column.

Installing columns and modules

Introduction   Refer to the tables for references to the procedures involved in installing columns and modules.

Installing a column

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

Installing a module

Procedure	Reference document	Chapter and section
Installing Meridian Mail modules	*SL-1 System Installation Procedures* (NTP 553-3001-210)	"Adding a module to a column"

Note 1: References to Overlay 37 apply only to a Meridian Mail module that is being added to an existing Meridian 1 column. Enter Overlay 37 commands on the Meridian 1 console. Ignore the references to Overlay 37 if you are not adding a module to an existing Meridian 1 column.

Note 2: If you are installing a module in a DC system, you cannot set power supply switches to on, as instructed at the end of "Adding a Module to a Column," because you have not yet installed the power supply.

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

Module doors and I/O cover

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

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

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

Module identification

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

If you are expanding an existing system and are adding a new module, the new module is shipped with a blank label. Complete the label as follows:

- The module that contains Meridian Mail node 1 is module MM0.

- The other module in any two-module system is module MM1.

- In a five-node shadowed system, the other module that contains two nodes (besides module MM0) is module MM1.

- The last module in a five-node shadowed system is module MM2.

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

Chapter 6

Installing power supplies

In this chapter

Overview

Introduction   This chapter provides the steps you need to install the common
                          equipment power supplies in each module of either an AC
                          (CEPS) or a DC (DCEPS) system.

                          Interpret references to modules MM0, MM1, and MM2 as
                          follows:

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

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

Common equipment power supply installation

Location of power supplies

Use the following table to determine the proper location for each power supply, then follow the steps for an AC or DC system for each module in the system.

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

AC system

⚠	**DANGER** **Risk of electrocution** Do not remove the power supply unless you turn off the shelf breakers and disconnect the power. Wait five minutes after you turn off the power before you remove the power supply.

Installing the CEPS for an AC system

To install the CEPS for an AC system, follow these steps.

Step	Action
1	Verify that the power to the Meridian Mail module is off. Use the circuit breakers shown in the following illustration.
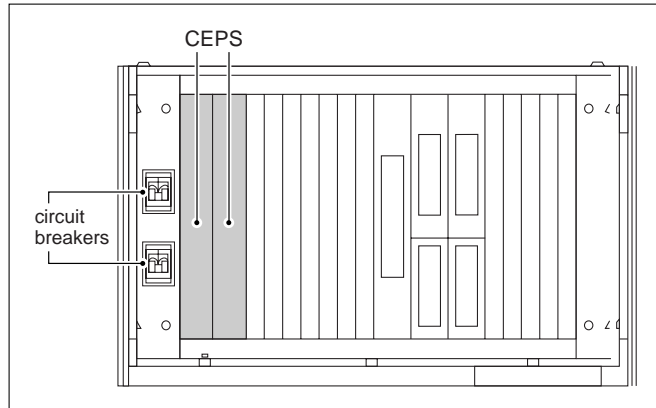
g100050

2	Open the ejectors and align the power supply with the appropriate CEPS slot in the module. See above.
3	Gently slide the power supply into the module. Push on the upper and lower edges until the power supply is fully seated in the module.
4	Close the ejectors.

Step	Action
5	Briefly turn on the power at the circuit breakers, and verify that the LED at the top of each CEPS lights up. a. If the LEDs light up, turn the power off again. b. If the LEDs do not light up, refer to Chapter 16, "Troubleshooting startup problems." and Appendix C, "Enhanced MMP40 (or MMP40) troubleshooting flowcharts."

DC system

<div style="border">

⚠ **DANGER**
Risk of electrocution

Do not remove the power supply unless
you turn off the DCEPS switches and
disconnect the power. Wait five minutes
after you turn off the power before you
remove the power supply.

</div>

Installing the DCEPS   To install the DCEPS for a DC system, follow these steps.
for a DC system

Step	Action
1	Verify that the switches on the DCEPS are off.
2	Open the ejectors and align the power supply with the appropriate DCEPS slot in the module.
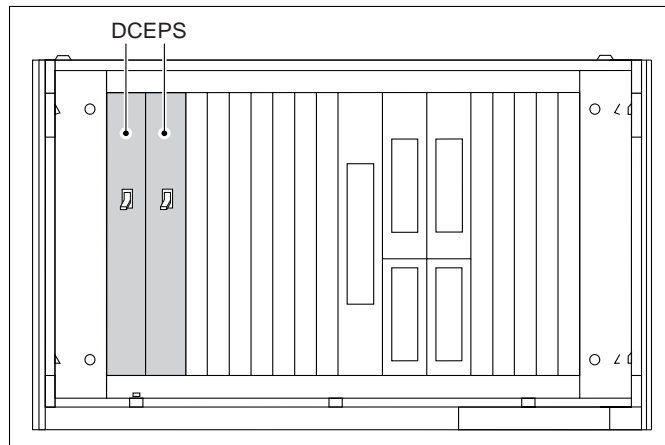
g100051

Step	Action
3	Gently slide the power supply into the module. Push on the upper and lower edges to fully seat the power supply in the module.
4	Close the ejectors.

Step	Action
5	Briefly turn on the switches on the DCEPS and verify that the LED at the top of each DCEPS lights up.
	a. If the LEDs light up, turn the power off again.
	b. If the LEDs do not light up, refer to Chapter 16, "Troubleshooting startup problems." and Appendix C, "Enhanced MMP40 (or MMP40) troubleshooting flowcharts."

Chapter 7

Installing the disk drives and tape drive

In this chapter

Overview

Introduction   This chapter provides instructions on how to install disk and
                          tape drives. You need to install drives in each module of the
                          system.

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

                          The system supports 300 Mbyte, 1.0 Gbyte, 2 Gbyte, and
                          4 Gbyte disk drives. The disk drives, manufacturer model
                          number, and Nortel Networks Product Engineering Codes
                          (PEC) are shown in the table "Modular Option EC disk drives"
                          on page 7-3.

                          You must verify jumper settings before you install drives. Disk
                          drive jumper settings are shown in the disk drive illustrations in
                          this chapter. See "Disk drive diagrams" on page 7-13.

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

**Modular Option EC
disk drives**

PEC code / Common product code	Title of assembly	Models	Individual disk drive CPC
NT6P06AA (A0391975)	300 Mbyte hard disk unit	Maxtor LXT340SY	A0351371
		Seagate ST1480N	
		Seagate ST3390N	A0602257
		Seagate ST5660N	A0616840
NT6P43AA	300 Mbyte disk with auxiliary power	Seagate ST5660N	
NT6P07AA (A0391976)	1.0 Gbyte hard disk unit	Maxtor MXT1240	A0383809
		Seagate ST11200	
		Seagate ST31230N	A0616792
		Seagate ST51080N	A0645393
		DEC DSP3105/3107	A0616792
NT6P44AA (A0394781)	1.0 Gbyte disk with auxiliary power	DEC DSP3105/3107	A0383809
		Maxtor MXT1240S	
		Seagate ST11200	
		Seagate ST31230N	A0616792
		Seagate ST51080N	A0645393
NT6P07BA (A0656257)	2.0 Gbyte hard disk unit	Seagate ST32151N	A0658640
NT6P44BA (A0656258)	2.0 Gbyte disk with auxiliary power	Seagate ST32151N	
NTDK74AB	4.0 Gbyte disk	Seagate ST34573N	

Disk drives in an unshadowed system

Slot locations   The following table and illustration show the slot locations of
                          the disk drives in an unshadowed system.

**Location of disk
drives for each node
in an unshadowed
system**

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

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

Location of disk drives in an unshadowed system

Meridian Mail Module		Node X/Y				Node Y	Node X		MSU3	MSU5	Node Z			
CE Power Sup	CE Power Sup	**0** VP/GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP/GP	**9**	**10**	**11**

g100046

Disk installation (unshadowed systems)

DANGER
Risk of electrical shock

Ensure that power to the module that you are working on is off before you install or remove disk drives.

CAUTION
Risk of equipment damage

Use extreme care and wear a grounding strap when you install disk drives. Disk drives are susceptible to electrostatic damage and damage from rough or improper handling.

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

1. Setting the SCSI ID for the primary disk

2. Installing disks in an unshadowed system

Setting the SCSI ID for the primary disk

To set the SCSI ID for the primary disk, follow these steps.

Step	Action
1	To find the header locations for a disk drive, use "Location of headers for SCSI settings" on page 7-6 to determine which figure to refer to.

Location of headers for SCSI settings

Disk drive model	See
Maxtor LXT340SY	page 7-14
Seagate ST1480N	page 7-15
Seagate ST3390N	page 7-16
Seagate ST5660N	page 7-17
Seagate ST11200	page 7-18
Maxtor MXT1240	page 7-19
DEC DSP3105 or DSP3107L	page 7-20
Seagate ST51080N	page 7-21
Seagate ST31230N	page 7-22
Seagate ST32151N	page 7-23
Seagate ST34573N	page 7-24

Note: The disk drive illustrations show settings for the primary and secondary disks. Use the primary disk settings for any disk drive in an unshadowed multinode system. Use the secondary disk setting only for the shadowing disk.

2	Remove any jumpers on the header to set the SCSI ID of the disk to 0.

Installing disks in an unshadowed system

To install disks in an unshadowed system, follow these steps.

Step	Action
1	Power off the module.
2	If the faceplate that covers the disk drive or tape drive area is in place, loosen the screws that hold it and slide the faceplate up and out.
3	Lay the disk drive on a flat, stable surface, with the disk drive carrier facing up. (See page 7-13 for a description.) If the disk drive contains separators, ensure that the separators are all present. Separators are little plastic disks that fit over the screw holes and protect the disk drive from damage caused by vibration.
4	Unpack each disk drive and ensure that it has the same part number, including suffix, as the one on your packing slip.

Step	Action
5	Follow the procedure for setting the SCSI ID for an unshadowed disk to verify that the SCSI ID on the drive is set to 0.
6	Verify that there is no terminator attached to the disk. Refer to the disk drive illustrations for terminator locations for each type of disk drive.
7	Verify that all other settings (for example, parity and motor start) are correctly set. Refer to the disk drive illustrations for disk drive settings.
8	Replace the disk drive carrier if it was removed. Verify that all separators are present.
9	Open the ejectors and align the disk drive carrier with the appropriate MSU slot in the module. (For disk slot locations within the module, refer to "Location of disk drives in an unshadowed system" and "Location of disk drives for each node in an unshadowed system" on page 7-4.)
10	Gently slide the card into the module, pushing on the upper and lower edges until the disk drive is fully seated in the module.
11	Close the ejectors.
12	Replace the faceplate.

Disk drives in a shadowed system

Slot locations   The following table and illustration show the slot locations of
                            disk drives in a shadowed system.

**Location of disk
drives for each node
in a shadowed system**

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

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

Disk drives in a shadowed system

Location of disk drives in a shadowed system

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Sup	CE Power Sup	**0** VP/GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP/GP	**9**	**10**	**11**

G100047

Disk installation (shadowed systems)

DANGER
Risk of electrical shock

Ensure that power to the module that you are working on is off before you install or remove disk drives.

CAUTION
Risk of equipment damage

Use extreme care and wear a grounding strap when you install disk drives. Disk drives are susceptible to electrostatic damage and damage from rough or improper handling.

The installation of disks in a shadowed system involves the following three procedures:

1. Setting the SCSI ID for a primary disk

2. Setting the SCSI ID for a secondary disk

3. Installing disks in a shadowed system

Setting the SCSI ID for a primary disk   To set the SCSI ID for a primary disk, follow these steps.

Step	Action
1	To find the header locations for the primary disk drive, use "Location of headers for SCSI settings" on page 7-6 to determine the figure to which you should refer.
	Note: To set the termination header, you must remove the disk drive carrier. To remove the disk drive carrier, see step 2 in "Installing disks in a shadowed system" on page 7-12.
2	Set the SCSI ID of the primary disk to 0 by removing any jumpers on the header. See the disk drive illustrations in this chapter for the locations of the jumpers.
	When you remove these jumpers, the SCSI ID of the disk sets to 0.

Setting the SCSI ID for a secondary disk   To set the SCSI ID for a secondary disk, follow these steps.

Step	Action
1	To find the header locations for the secondary disk drive, use "Location of headers for SCSI settings" on page 7-6 to determine the figure to which you should refer.
	Note: To set the termination header, you must remove the disk drive carrier. To remove the disk drive carrier, see step 2 in the following procedure.
2	Set the SCSI ID of the secondary disk to 2 by removing any jumpers, or inserting a jumper, on the header. See pages 7-14 to 7-24 for the locations of jumper settings for the secondary disk.

Installing disks in a shadowed system

To install disks in a shadowed system, follow these steps.

Step	Action
1	Power off the module.
2	If the faceplate that covers the disk drive/tape drive area is in place, loosen the screw that holds it and slide the faceplate up and out.
3	Lay the disk drive on a flat stable surface, with the disk drive carrier facing up. (See page 7-13 for a description.) If the disk drive contains separators, ensure that they are all present. Separators are little plastic disks that fit over the screw holes and protect the disk drive from damage caused by vibration.
4	Unpack each disk drive and verify that it has the same part number, including suffix, as the one on your packing slip.
5	Verify that the SCSI ID on each primary drive (without power pack) is set to 0 by following the steps outlined in "Setting the SCSI ID for a primary disk" on page 7-11.
6	Verify that the SCSI ID on each secondary drive (with power pack) is set to 2 by following the steps outlined in "Setting the SCSI ID for a secondary disk" on page 7-11.
7	Verify that all terminators are removed from each disk. Refer to the illustrations on pages 7-14 to 7-24 for terminator locations for each type of disk drive.
8	Ensure that all other settings (for example, parity and motor start) are correctly set. Refer to the illustrations on pages 7-14 to 7-24 for disk drive settings.
9	Replace the disk drive carrier if it was removed. Ensure that all separators are present.
10	Open the ejectors and align the disk drive carrier with the appropriate MSU slot in the module (refer to "Location of disk drives in a shadowed system" on page 7-9, and "Location of disk drives for each node in a shadowed system" on page 7-8 for disk slot locations within the module).
11	Gently slide the card into the module, pushing on the upper and lower edges until the disk drive is fully seated in the module.
12	Close the ejectors.
13	Replace the faceplate.

Disk drive diagrams

Introduction

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

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

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

Note 1: Cutouts are not present on the disk drive plate to accommodate Seagate and DEC disk drives.

Note 2: The following disk drive diagrams show settings for the primary and secondary disks. You should use the primary disk settings for any disk drive in an unshadowed multi-node system. You should only use the secondary disk setting for the shadowing disk.

300 Mbyte Maxtor LXT340SY disk drive connectors and jumper settings

J1 SCSI I/O connector

DC power connector

SCSI ID settings for J6

A2 A1 A0

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

1= IN
0= OUT

A2
A1
A0

Pin 1

J6

J7

Settings for J6

A2 A1 A0

Motor start jumper

Parity jumper

Settings for J7

11 9 7 5 3 1

12 10 8 6 4 2

Single ended

J4 (No jumpers)
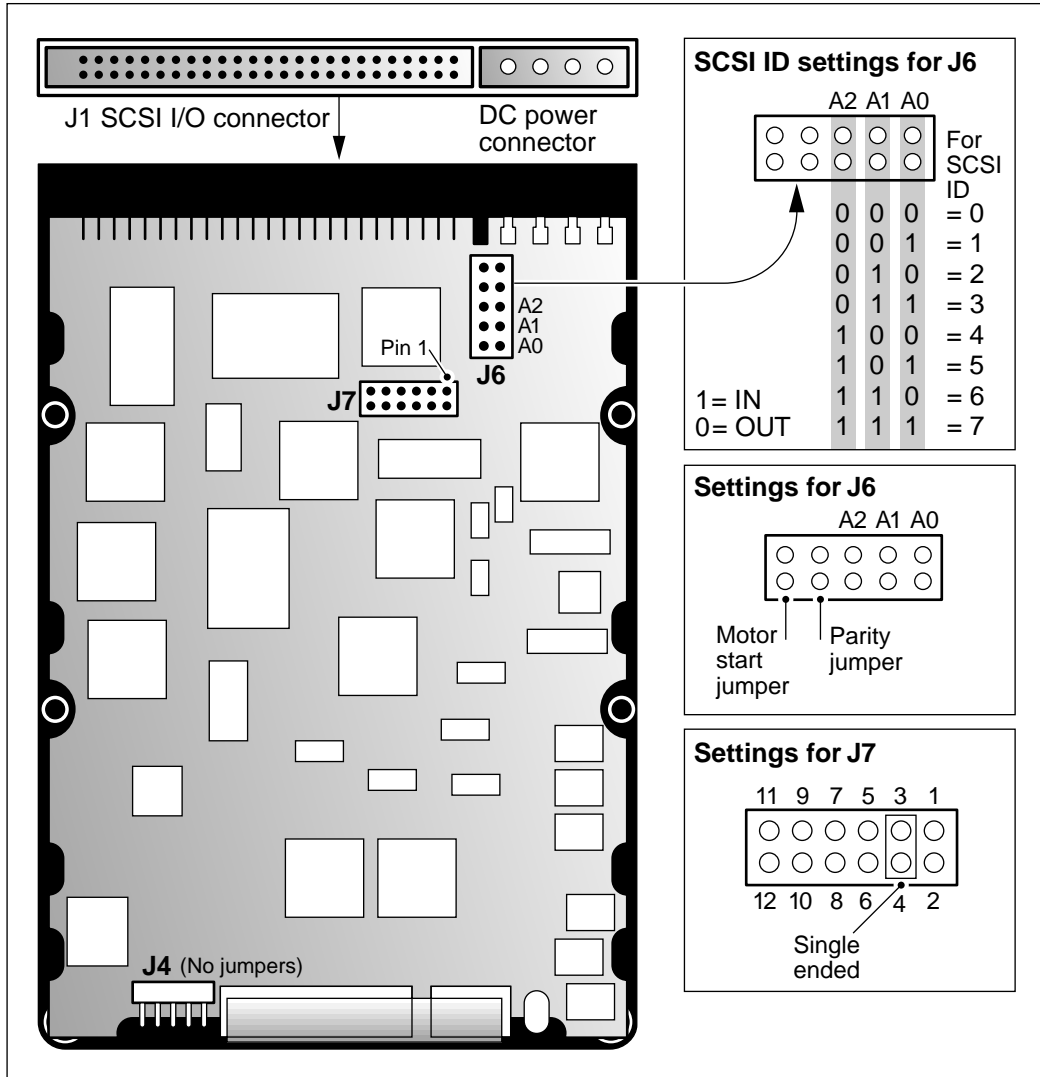
G101351

300 Mbyte Seagate ST1480N disk drive connectors and jumper settings

DC power connector

SCSI I/O connector

J5 (under PCB)

A0
A1
A2

SCSI ID settings for J5

PCB

A2 A1 A0

DC power connector

For SCSI ID

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

1= IN
0= OUT

Pin 1

J6 (under PCB)

Settings for J6

Pin 1   PCB

SCSI I/O connector

Parity setting
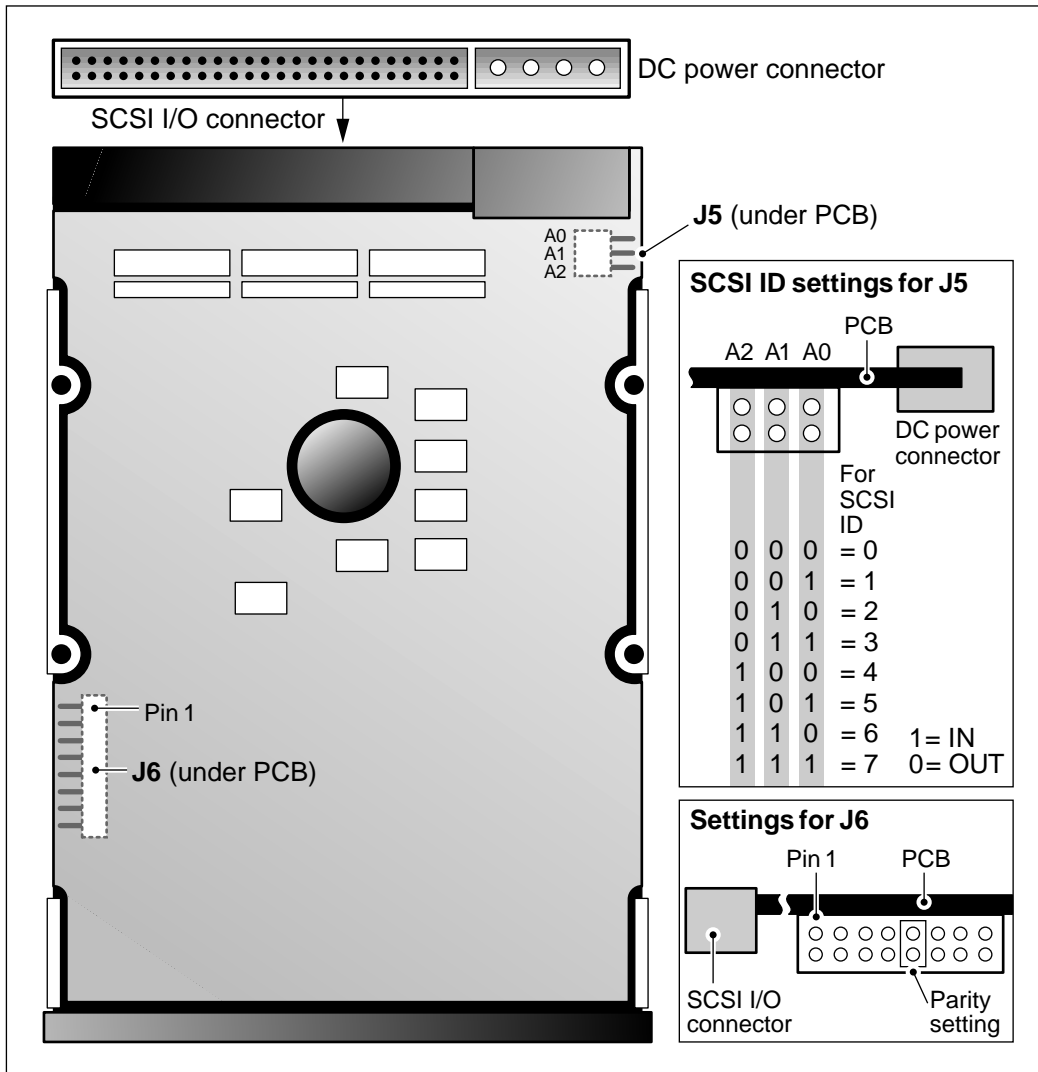
G101350

300 Mbyte Seagate ST3390N disk drive connectors and jumper settings
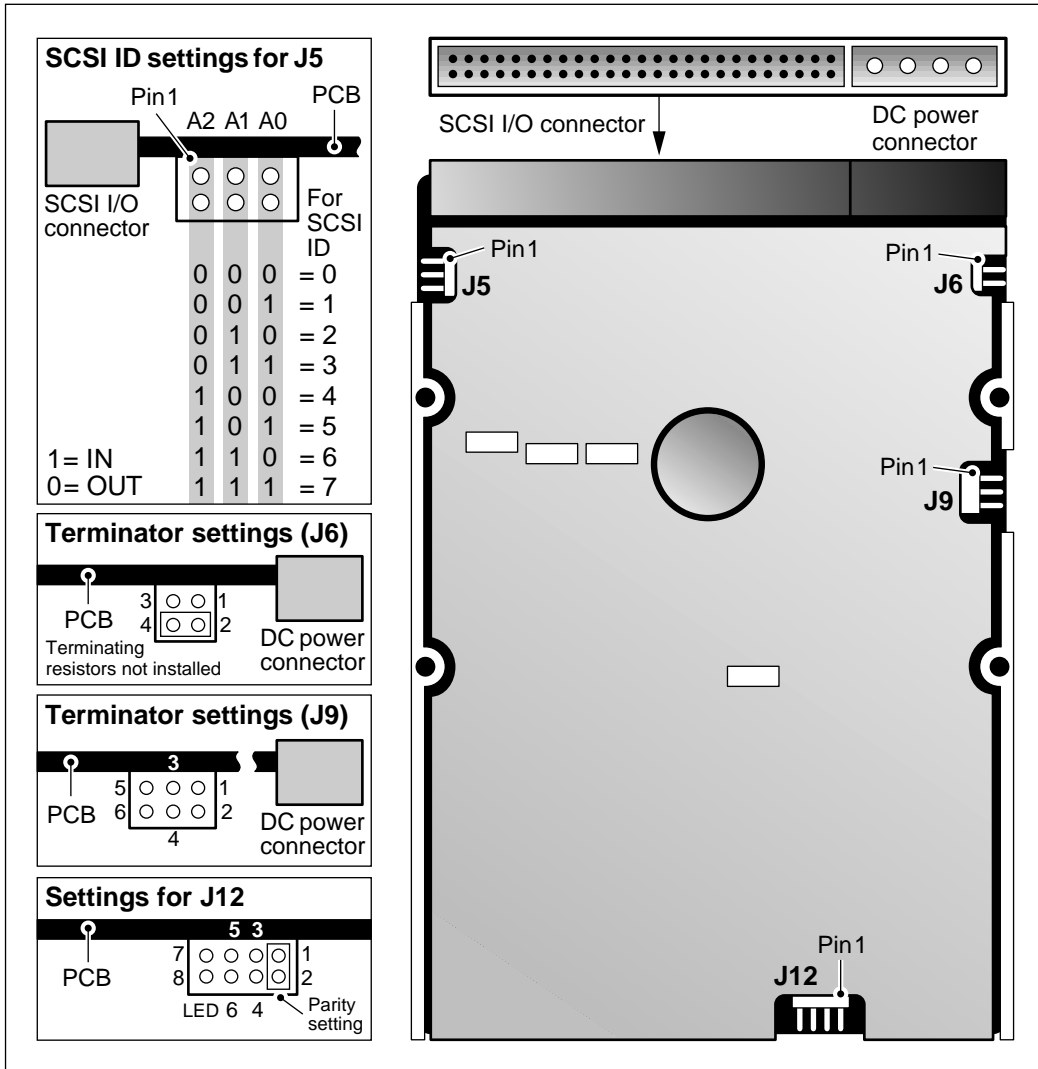
G101349

300 Mbyte Seagate ST5660N disk drive connectors and jumper settings

SCSI I/O connector

DC power connector

A2
A1
A0

J5 (no jumpers)

J8

Pin 1

SCSI ID settings for Options J8

PCB side up   Pin 1

33   19 17 15   A0 A1 A2

34   For SCSI ID:

Do not touch

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

Settings for Options J8

33   19 17 15   3 1

34

Terminator jumper   Remote start jumper

Parity jumper
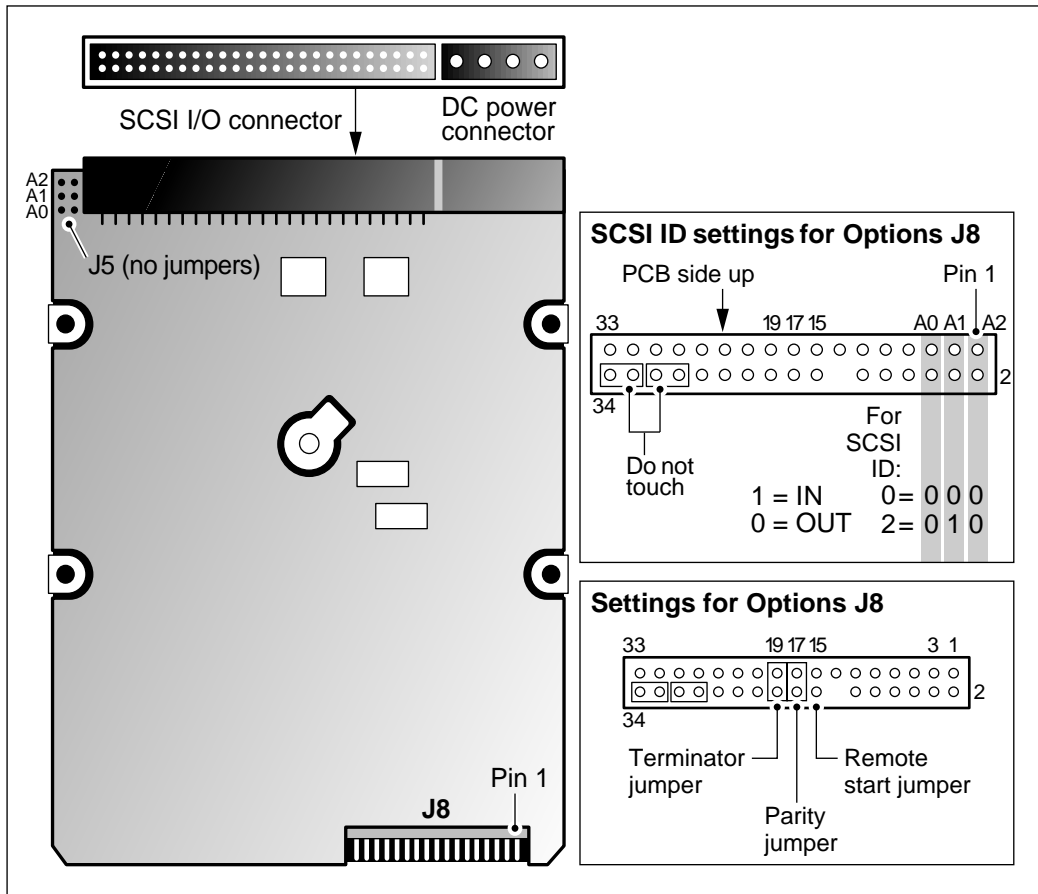
G101348

1.0 Gbyte Seagate ST11200 disk drive connectors and jumper settings

J1 SCSI I/O connector

DC power connector

Settings for J2

Parity Jumper

SCSI ID settings for J5

Pin 1 A2 A1 A0   PCB

SCSI I/O connector

For SCSI ID

	A2	A1	A0	
1 = IN	0	0	0	= 0
0 = OUT	0	1	0	= 2

Settings for J6

PCB   Anode   PCB

RES A0 A1 A2

Pin 1   Cathode
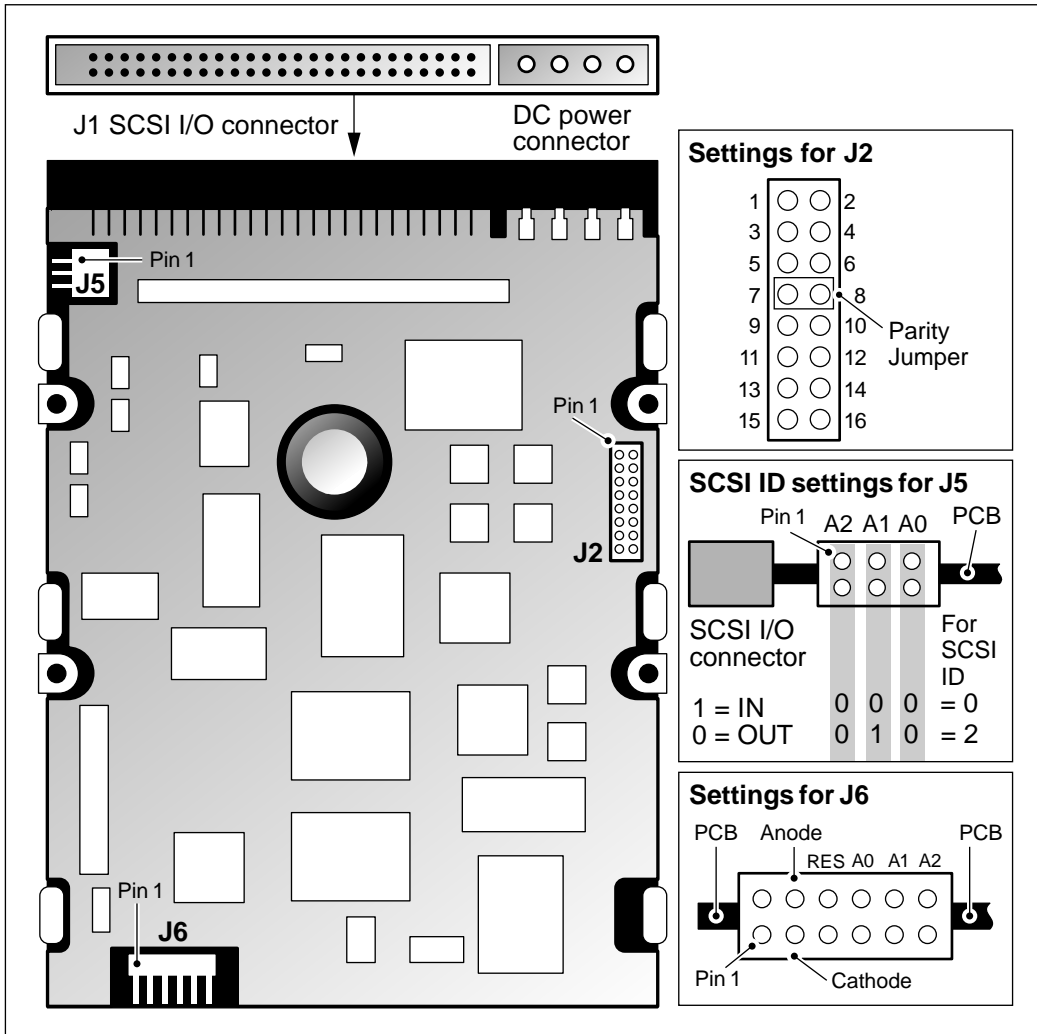
G101347

1.0 Gbyte Maxtor MXT1240 disk drive connectors and jumper settings

J1 SCSI I/O connector

DC power connector

SCSI ID settings for J6

A2 A1 A0   Pin 1

For SCSI ID

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

1 = IN
0 = OUT

J6

A2
A1
A0

Pin 1

J7

Pin 1

Settings for J6

A2 A1 A0   Pin 1

Motor start jumper

Parity jumper

Settings for J7

12 ○ ○ 11
10 ○ ○ 9
8 ○ ○ 7
6 ○ ○ 5
4 ○ ○ 3
2 ○ ○ 1

Single ended

JP5

A2 A1 A0

J4
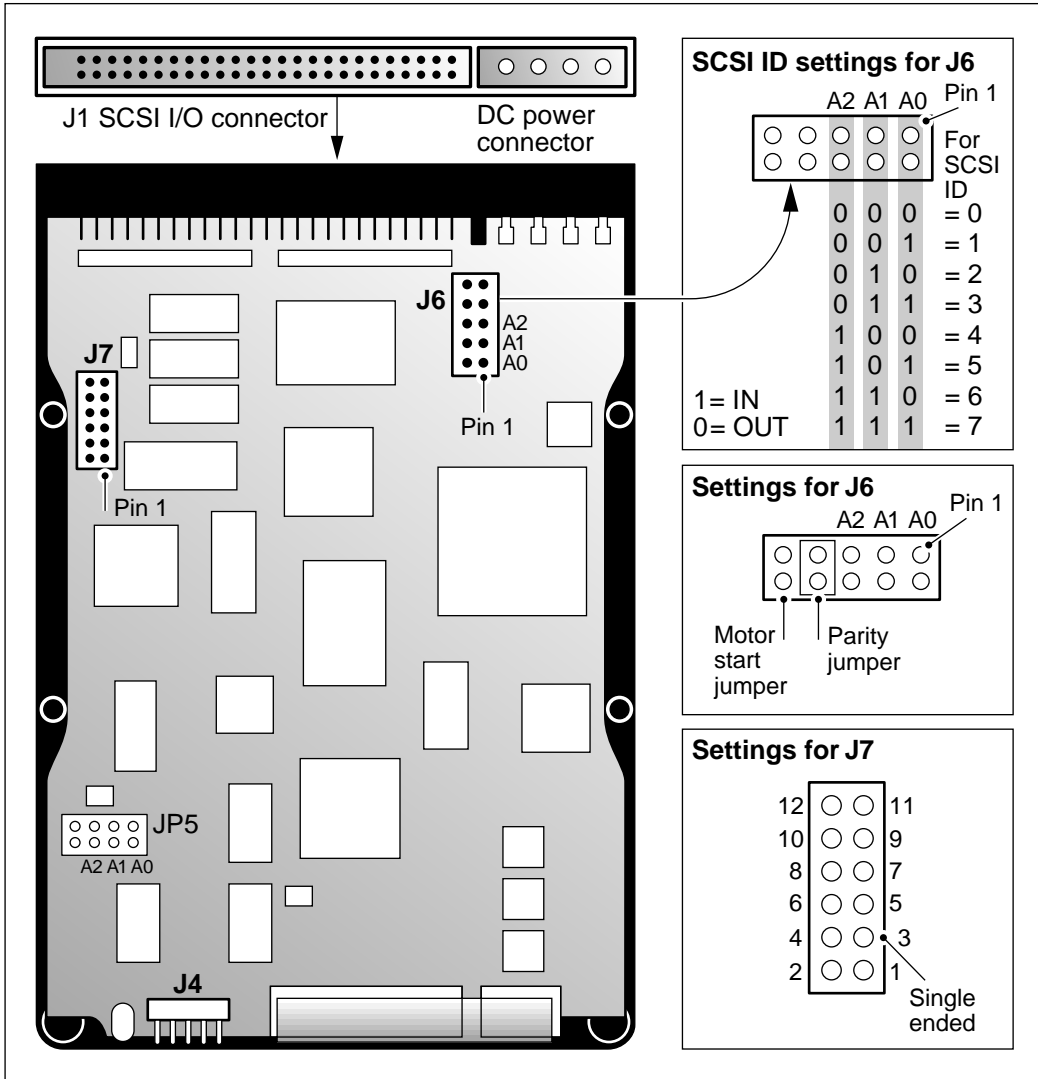
G101346

1.0 Gbyte DEC DSP3105/DSP3107L disk drive connectors and jumper settings
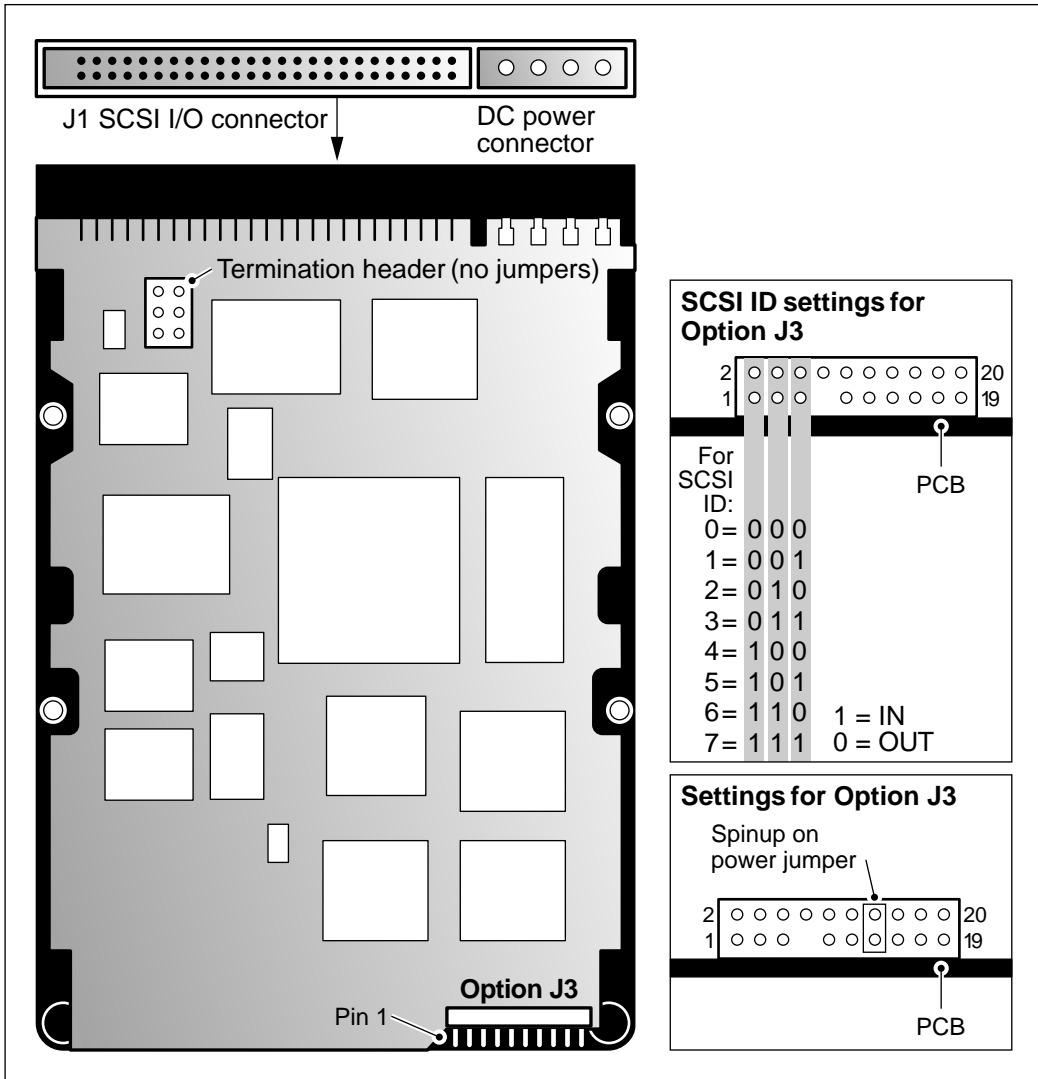
G101345

1.0 Gbyte Seagate ST51080N disk drive connectors and jumper settings

SCSI I/O connector

DC power connector

SCSI ID settings for Options J8

PCB side up

33   19 17 15   1

2

34

Do not touch

For SCSI ID:

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

Settings for Options J8

33   19 17 15   3 1

2

34

Terminator jumper

Remote start jumper

Parity jumper

Pin 1

J8
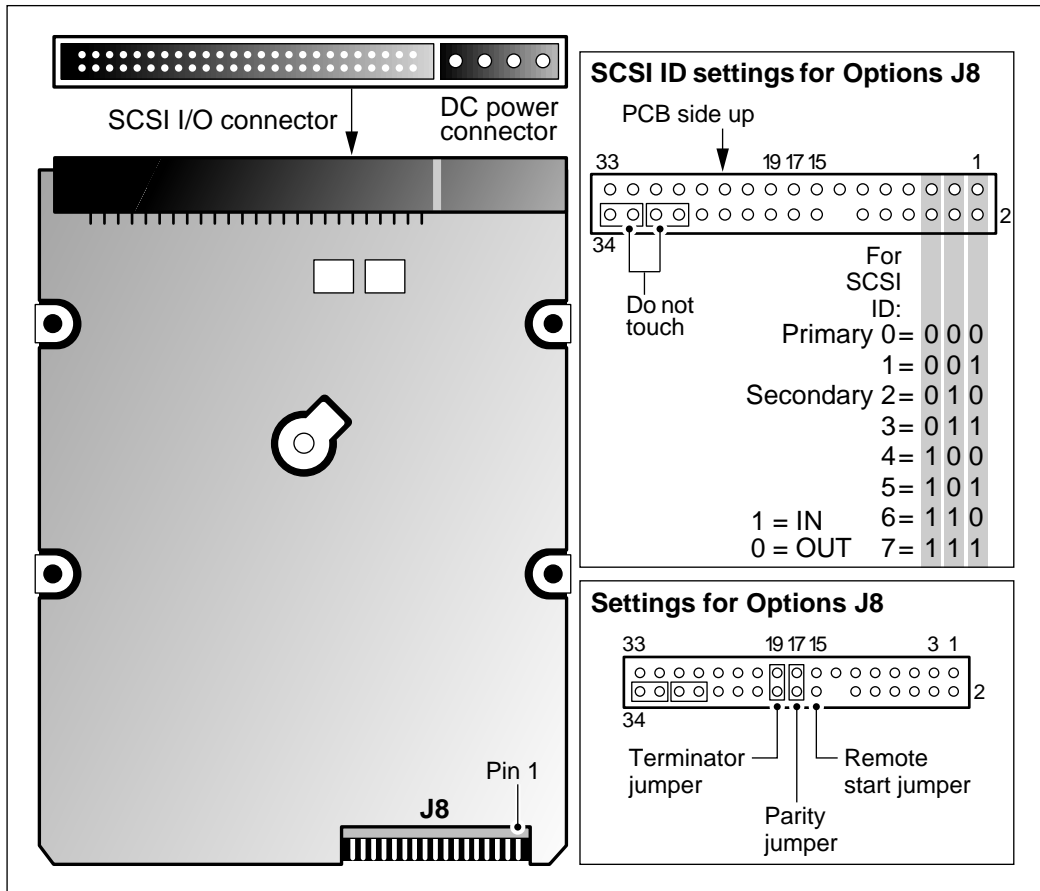
G101344

1.2 Gbyte and 2.0 Gbyte Seagate ST31230N disk drive connectors and jumper settings
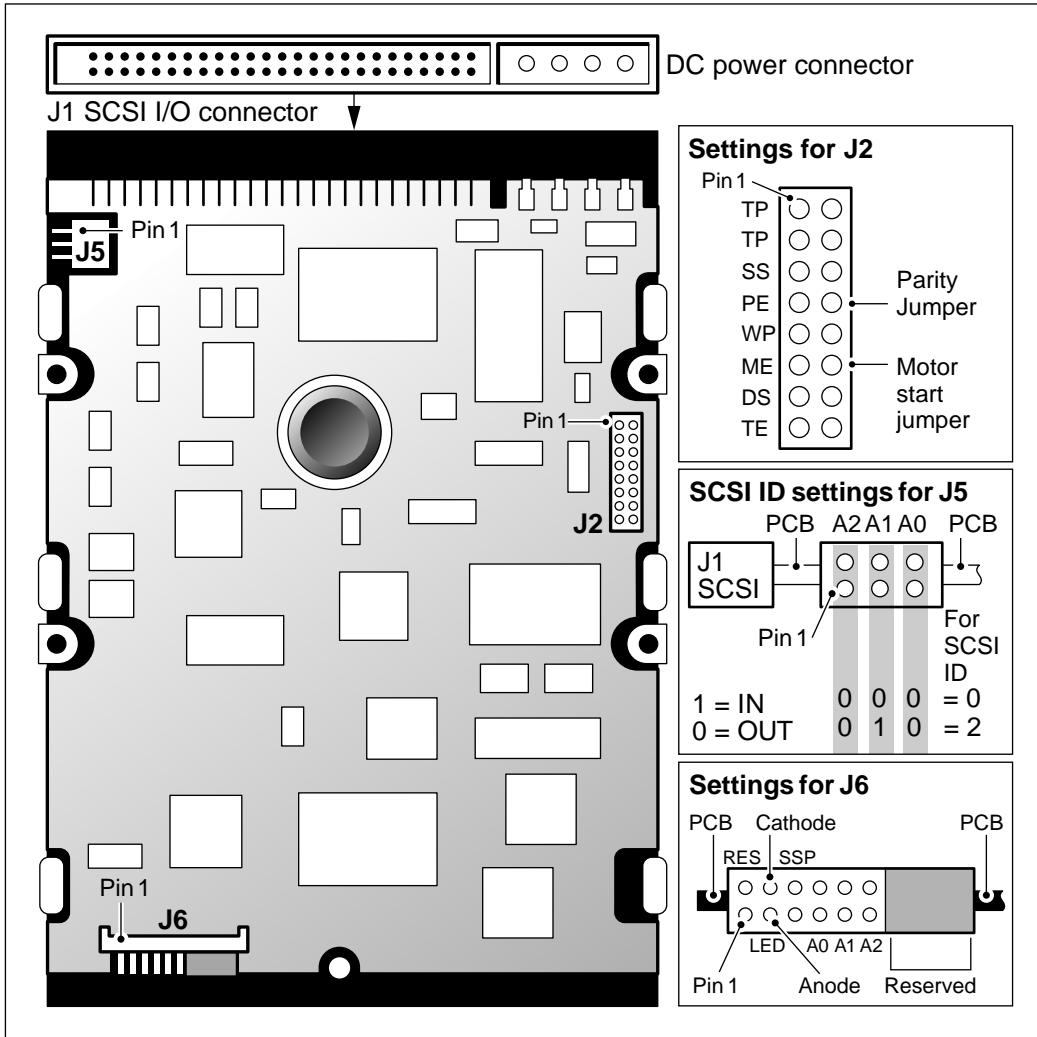
G101343

2.1 Gbyte Seagate ST32151N disk drive connectors and jumper settings

DC power connector

J1 SCSI I/O connector

Settings for J2

Pin 1

TP
TP
RES
PD
WP
ME
DS
TE

Parity Jumper

Pin 1

J2

SCSI ID settings for J6

PCB   RES   PCB

A0 A1 A2   LED

Pin 1

For SCSI ID   Reserved

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

Pin 1

J6
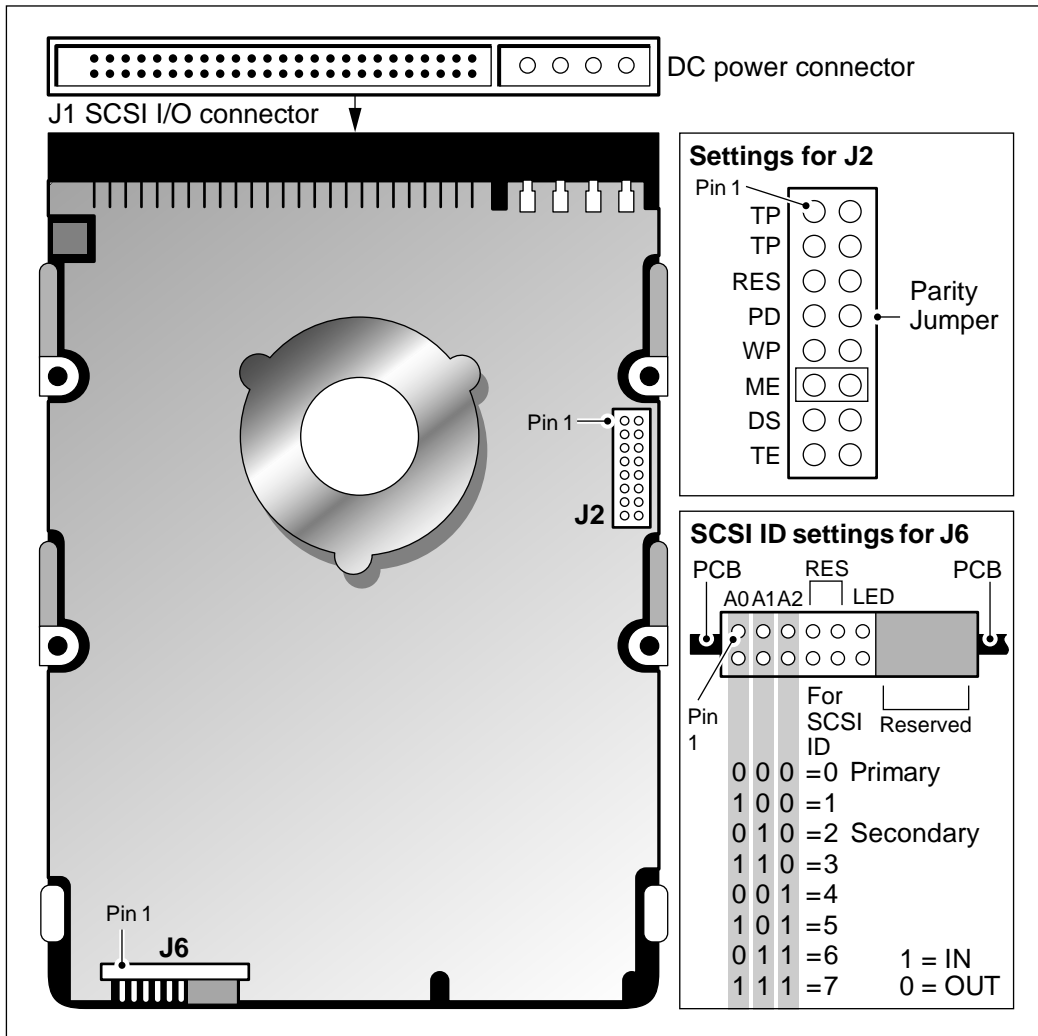
G101342

4.0 Gbyte Seagate ST34573N disk drive connectors and jumper settings

(See photo on next page.)
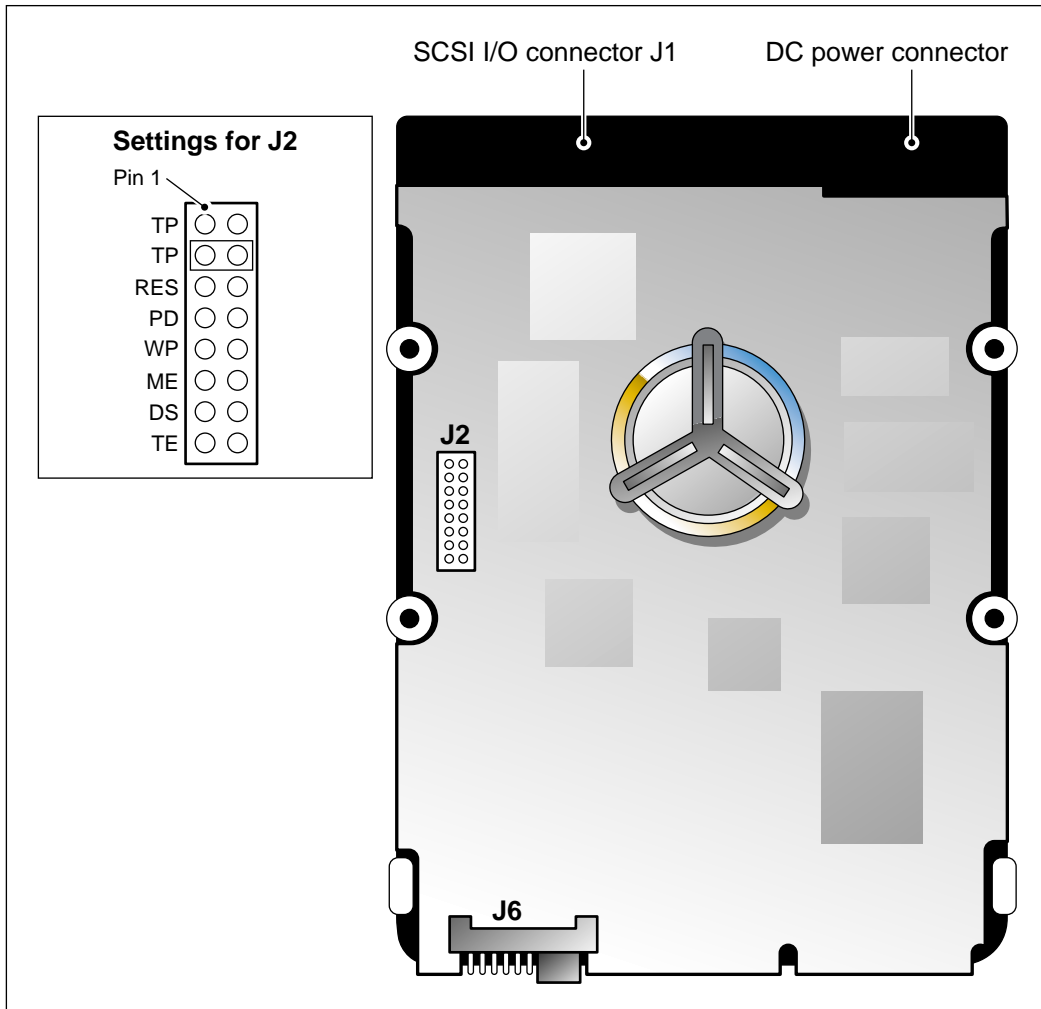
G101299
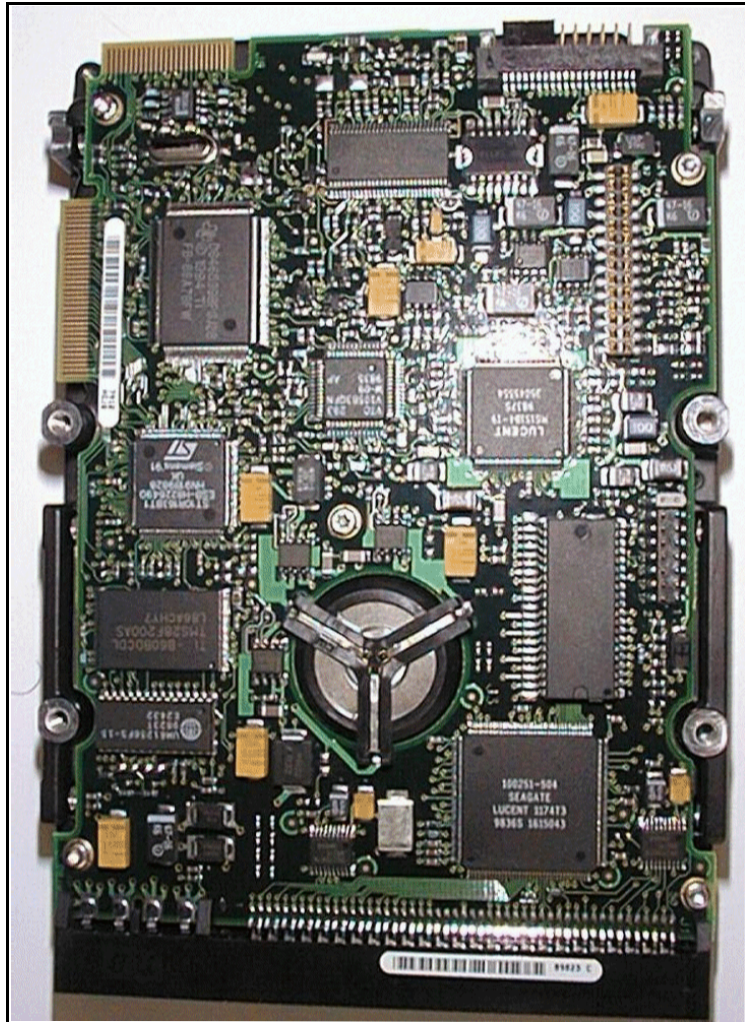
Overview of tape drives

Introduction   The system requires a tape drive to read information from the
                               Install/data tape cartridge for the installation or upgrade of
                               system software. You may also use the tape drive to back up
                               system and voice data.

                               Two tape drives are supported for Release 13 of the Modular
                               Option EC system, as listed in the following table.

Tape drive	PEC code	Storage capacity
Tandberg TDC4220	NT6P05BA (A0630014)	2.5 Gbytes
Archive 2150	NT6P05AA (A0391974)	250 Mbytes

Tandberg tape drive

Introduction

All new Modular Option EC systems ship with the Tandberg TDC4220 tape drive. This tape drive has a maximum storage capacity of 2.5 Gbytes. The Tandberg tape drive is compatible with all existing Meridian Mail tapes.

Note: You do not require an upgrade to the Tandberg drive for conversion from an earlier release of Meridian Mail to Release 13, as the existing Archive (Viper) tape drive is fully compatible. If you choose to install the new Tandberg tape drive, refer to Chapter 15, "Converting from an existing Modular Option EC system to Release 13," for detailed instructions.

An LED indicator light on the front panel of the tape drive shows the current status of the drive's operation. Refer to the table below for an explanation of each mode.

Inserting and removing tapes

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

LED indicator on Tandberg tape drive

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

Archive tape drive

Introduction

The existing Archive tape drive has a storage capacity of 250 Mbytes. An LED indicates whether the drive is working. To determine if the tape drive is actually working, you must listen for the distinctive whirring noise.

Inserting and removing tapes

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

Supported tape formats

The Tandberg and Archive tape drives can read and write on a number of tape formats, as shown in the table below.

Note: The amount of data that you can write on a tape depends on the condition of the cartridge. If a cartridge has many media imperfections, it stores less data since blocks must be rewritten in another area on the tape.

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

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

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

Tape drive location

Introduction   The illustration below shows the slot location of the tape drives
                          in a Modular Option EC system. You always install the tape
                          drive in module MM0 in the slot labeled MSU1 (mass storage
                          unit).

Location of tape drive

Meridian Mail Module		Node X/Y				Node Y		Node X			MSU3	MSU5	Node Z				
CE Power Sup	CE Power Sup	**0** VP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP	**9**	**10**	**11**	

G100575

Tape drive installation

Introduction　　　　The installation of tape drives involves the following two procedures:

1.　setting the SCSI ID of the tape drive (see below)

2.　the actual installation of the tape drive (see "Installing the tape drive" on page 7-32)

<table>
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CAUTION
Risk of equipment damage

Use extreme care and wear a grounding strap when you install the tape drive. The tape drive is susceptible to electrostatic damage, and to damage from rough or improper handling.

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DANGER
Risk of electrical shock

Ensure that power to the module that you are working on is off before you install or remove the tape drive.

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</tr>
</table>

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

Step	Action
1	Find the SCSI ID header. Refer to "Archive tape drive connectors and jumper settings" on page 7-33, or "Tandberg tape drive connectors (front view)" on page 7-33 for the header location.
2	Set the SCSI ID of the tape drive to 1 by removing any existing jumpers, then insert a jumper, as indicated in the figures.
3	Verify that the tape drive terminator resistor packs are removed, as indicated in the illustrations.

Step	Action
4	Verify the other jumpers. For Archive tape drives, refer to "Archive tape drive connectors and jumper settings" on page 7-33; for Tandberg tape drives, refer to "Tandberg tape drive connectors and jumper settings (rear view)" on page 7-34, and "Tandberg tape drive connectors (front view)" on page 7-33, for jumper information.

Installing the tape drive

To install the tape drive, follow these steps.

Step	Action
1	Power off the module.
2	If the faceplate that covers the disk drive/tape drive area is in place, loosen the screw that holds it and slide the faceplate up and out.
3	Unpack the tape drive and ensure that it has the same part number, including suffix, as the one on your packing slip.
4	Follow "Setting the SCSI ID for the tape drive" on page 7-31 to ensure that the SCSI ID on the drive is set to 1.
5	Verify that all terminators are removed from the tape drive. For Archive tape drives, refer to "Archive tape drive connectors and jumper settings" on page 7-33. For Tandberg tape drives, refer to "Tandberg tape drive connectors and jumper settings (rear view)" on page 7-34, and "Tandberg tape drive connectors (front view)" on page 7-33 for terminator locations.
6	Open the ejectors and align the tape drive with slot MSU1 in module MM0. *Note:* The tape drive always goes in the MSU1 slot of module MM0.
7	Gently slide the drive into the module, pushing on the upper and lower edges until the drive is fully seated in the module.
8	Close the ejectors.
9	Replace the faceplate.

Archive tape drive connectors and jumper settings
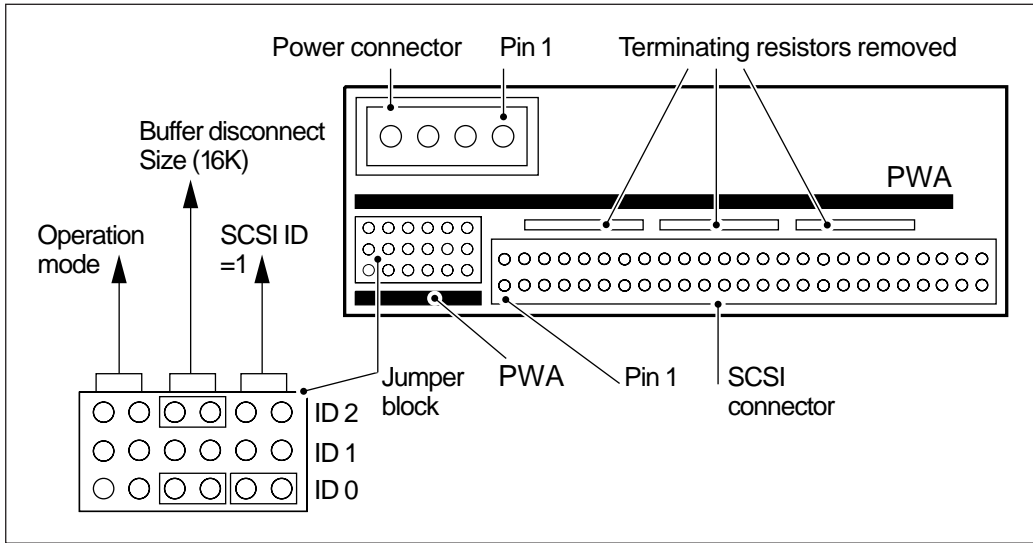
G100025

Tandberg tape drive connectors (front view)

G100022

Tandberg tape drive connectors and jumper settings (rear view)

Terminating resistors removed

Tpwr

Select 0   SCSI ID= 1
     1
     2

Parity

In
Out

Test
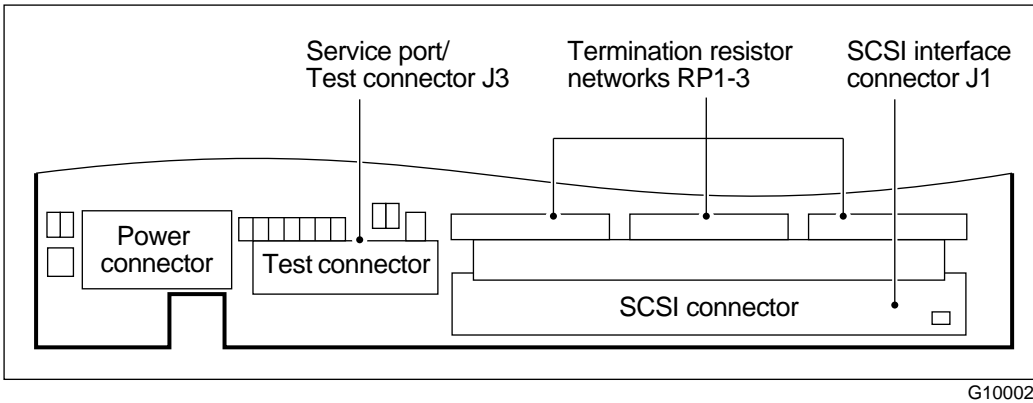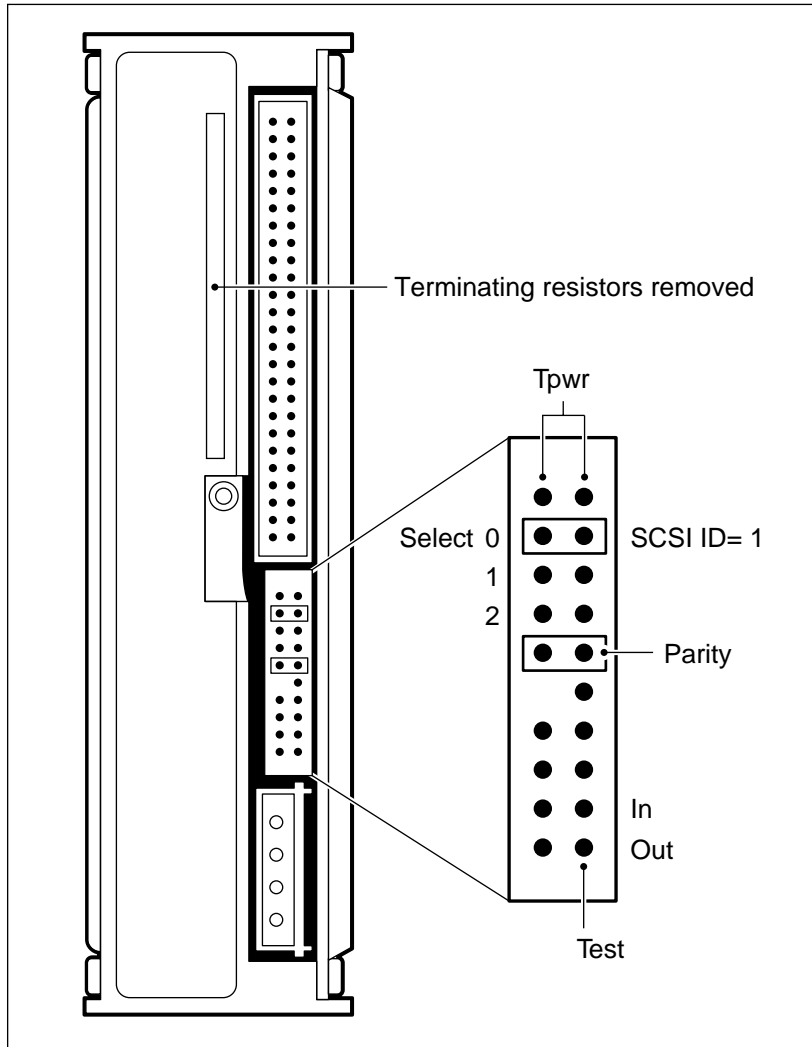
G100016

Chapter 8

Configuring the backplane and inspecting the printed circuit packs

In this chapter

Overview of configuring the backplane

Introduction   Configuration of the backplane consists of the following tasks
for each module:

- Set the backplane switches.
- Install or remove the address shroud jumper.
- Install or remove the EVB shroud terminator.

Backplane switch settings

Introduction   The system ships with the backplane switches set for the configuration selected by the customer. However, you should verify the backplane switch settings. Backplane switch locations are shown in "Location of backplane switches, shrouds, and terminators" on page 8-4.

Location of backplane switches, shrouds, and terminators

Shroud S7 EVB terminator NT6P0106 Locator marks Alarm/Modem connector Shrouds S4 & S5

J11

S7

S5 S4

SW2 SW4

CSL J3

SW1 SW3

I/O R0

SW5

Address shroud jumper NT6P0104

Backplane switches

Locator marks

J5 J4

R1

I/O

LP LP

Note: S7 is visible when the backplane is viewed at a slight angle. It is normally hidden by the left I/O panel when you look straight into the backplane.
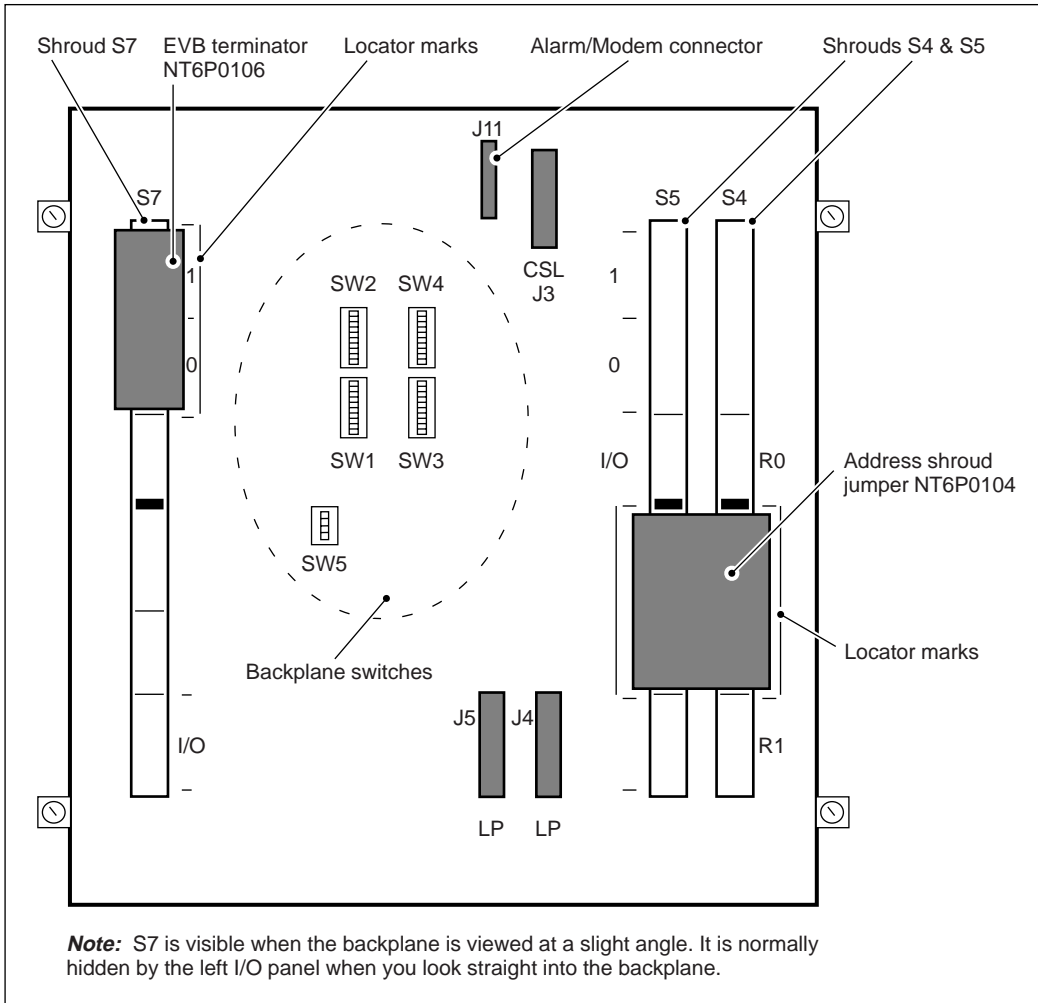
G101340

CAUTION
Risk of equipment damage

Wear a grounding strap when you work on the backplane. Components attached to the backplane are susceptible to electrostatic damage.

Setting the backplane switches in an unshadowed system

Setting the backplane switches (unshadowed system)

To set the backplane switches in an unshadowed system, follow these steps.

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

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

Step	Action
2	Set backplane switches SW1 and SW3 to the ON position.
3	Set backplane switches SW2 and SW4 to the OFF position.
4	Set SW5 for each module according to the module number as shown in the following table.

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

Module references for an unshadowed system

Interpret references to modules MM0 and MM1 as follows:

- The module that contains Meridian Mail node 1 is module MM0. MM0 also contains nodes 2 and 3 in a multinode system.
- The module that contains Meridian Mail node 4 (and 5) is module MM1.

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

Setting the backplane switches in a shadowed system

Setting the backplane switches (shadowed system)

To set the backplane switches in a shadowed system, follow these steps.

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

> ⚠ **CAUTION**
> **Risk of equipment damage**
>
> You must install the address shroud jumper and the EVB terminator *very* carefully to avoid damage to the backplane pins.

Step	Action
2	Set backplane switches SW1 and SW3 to the off position.
3	Set backplane switches SW2 and SW4 to the on position.
4	Set SW5 for each module according to the module number, as shown in the following table.

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

Module references for a shadowed system
Interpret references to modules MM0, MM1, and MM2 as follows:

- The module that contains Meridian Mail node 1 is module MM0. MM0 also contains node 2 in a multinode system.

- The module that contains Meridian Mail node 3 (and 4) is module MM1.

- The module that contains Meridiain Mail node 5 is MM2.

Note: Whenever reference is made to the "last module in the system," it means the module in which the highest node resides. For example, in a 5-node shadowed system, the last module is MM2.

Shroud terminators and jumpers

Introduction

The system ships with the shroud terminators and jumpers needed for the configuration as selected by the customer. However, verify the terminator and jumper locations as described below. Terminator and jumper locations are shown in "Location of backplane switches, shrouds, and terminators" on page 8-4.

⚠	**CAUTION** **Risk of equipment damage** You must install the address shroud jumper and the EVB terminator very carefully to avoid damage to the backplane pins.

S4 and S5 address shroud jumper

Locate the address shroud jumper at the upper part of the bottom of slots S4 and S5. See "Location of backplane switches, shrouds, and terminators" on page 8-4. Locator lines to the left of shroud S5 and the right of shroud S4 mark its location.

Note: The shroud jumper looks like a circuit board.

IF the system has	AND is	THEN the address shroud
1 or 2 nodes	unshadowed	is present in MM0.
3 nodes		is not present in MM0.
4 or 5 nodes		is present in MM1.
1 or 2 nodes	shadowed	is present in MM0.
3 or 4 nodes		is present in MM0 and MM1.
5 nodes		is present in MM0, MM1, and MM2.

In essence, the address shroud jumper is present in all shadowed and unshadowed systems, except those unshadowed configurations where MM0 has three nodes. For example, a 4-node unshadowed system only has the address shroud jumper in MM1 because MM0 contains three nodes; a four-node

shadowed system has the address shroud jumper in both MM0 and MM1 because they each contain two nodes.

S7 EVB terminator You need to terminate the EVB on the last module of a chain of modules. This requires a terminator across the 1 and 0 positions of shroud S7. See "Location of backplane switches, shrouds, and terminators" on page 8-4. Locator lines to the right of shroud S7 mark its location. The only configuration that does not require a terminator is a 2- or 3-module system that has a utility pack in the last module, because the utility card terminates the bus.

Note: The terminator looks like a circuit board.

Printed circuit packs (PCPs)

Introduction   The Meridian Mail Modular Option EC uses the following
                                PCPs:

- Enhanced MMP40 card
- utility card
- voice processor cards (VP4 and VP8)

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

> **CAUTION**
> **Risk of equipment damage**
>
> Only the voice processor cards are hot-
> pluggable. That is, you can remove or insert
> voice processor cards while power to the
> module is still on. However, you must use
> the "System Status and Maintenance"
> function on the administration terminal to
> disable the cards prior to removal. See the
> *System Administration Guide*
> (NTP 555-7001-301) for details on how to
> disable cards.

Removing, checking, and installing PCPs

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

<table>
<tr>
<td>⚠️</td>
<td>

CAUTION
Risk of equipment damage

Use extreme care and wear a grounding strap when you handle the PCPs. PCPs are susceptible to electrostatic damage, and to damage from rough or improper handling.
</td>
</tr>
</table>

Removing, checking, and installing a PCP

To remove, check, and install PCPs, follow these steps.

Step	Action
1	Open the ejectors on each card and gently pull the card toward you.

(a)   (b)
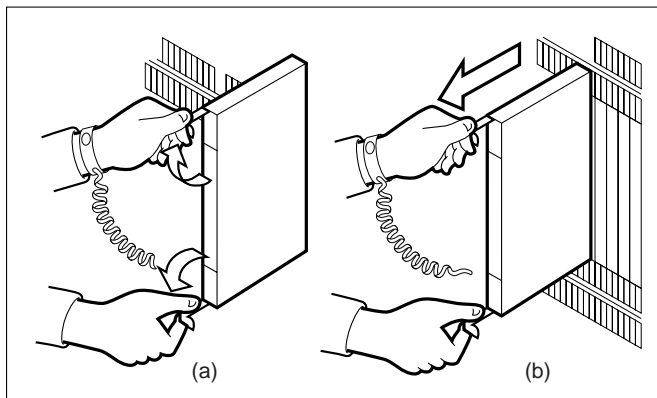
G100044

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

Step	Action
3	Check that the switch settings on each utility card are correct.
	a. For HVS only, set all positions of the onboard switch to On.
	If you have Hospitality Voice Services (HVS), this allows software control of the connection between Meridian Mail and HVS while the faceplate switch is on. If you do not have HVS, the onboard switch has no effect.
	b. Set the faceplate switch to NORM.
	While this switch is in the Off position, ports 3 and 4 (connectors P2 and P3) of the 5-port RS-232 fanout cable are looped back.
4	If you do not intend to reinstall a card immediately, place it in an electrostatic discharge (ESD) protective container, and place the container in a safe location.
5	Reseat the card in the module: align the card with the slots in the module, with the ejectors still in the open position, and gently slide the card back into the module.
6	Seat and lock the card by following the steps listed below:
	a. Push on the upper and lower edges of the faceplate until the card is fully seated in the module.
	b. Close the ejectors.

Switch settings

The Modular Option EC processor board (NT6R15AA) has a JTAG/XChecker switch which needs to be set to allow loading. Verfy that this switch is set according to the following table.

Board	Switch	S1	S2
NT6R15AA	S2	OFF	ON

Location of Enhanced MMP40 cards

Introduction

The slot location of the Enhanced MMP40 CPU card in a node depends on the number of nodes in the module. See the tables and the illustrations that follow.

Location of Enhanced MMP40 cards in an unshadowed system

IF the unshadowed system has	THEN Enhanced MMP40 cards are located in
1 node	slot 6 of MM0.
2 nodes	slots 6 and 7 of MM0.
3 nodes	slots 6, 7, and 4 of MM0.
4 nodes	slots 6, 7, and 4 of MM0, slot 6 of MM1.
5 nodes	slots 6, 7, and 4 of MM0, slots 6 and 7 of MM1.

Location of Enhanced MMP40 cards in a shadowed system

IF the shadowed system has	THEN Enhanced MMP40 cards are located in
1 node	slot 6 of MM0.
2 nodes	slots 6 and 7 of MM0.
3 nodes	slots 6 and 7 of MM0, slot 6 of MM1.
4 nodes	slots 6 and 7 of MM0, slots 6 and 7 of MM1.
5 nodes	slots 6 and 7 of MM0, slots 6 and 7 of MM1, slot 6 of MM2.

**Location of MMP40/
Enhanced MMP40
cards**

Meridian Mail Module		Node X/Y				Node Y		Node X			MSU3	MSU5		Node Z				
CE Power Sup	CE Power Sup	**0** VP/ GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4		**7** MMP 40	**8** VP/ GP	**9**	**10**	**11**	

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

Location of utility cards

Introduction There is always a utility card in slot 5 of module MM0. See the following illustration. If there is a second utility card, it is located in slot 5 of the last module (that is, in module MM1 for a 2-module system, or in module MM2 for a 3-module system).

Location of utility cards

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Sup	CE Power Sup	**0** VP/GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP/GP	**9**	**10**	**11**

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Location of VP cards

Introduction

The slot locations of VP cards in a module depend on the number of nodes in the module and the number of ports in the system. The CPU card used also determines the maximum number of ports allowed per node. The Enhanced MMP40 card supports up to 96 voice ports. See the following tables.

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

Location of VP cards in an unshadowed Enhanced MMP40 system

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

Location of VP cards in a shadowed Enhanced MMP40 system

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

Location of VP cards

VP card slots. VP8 cards can go in any of the slots numbered 0 to 2 or 8 to 10, while VP4 cards can only go in slots 2 to 3 or 10 to 11, depending on the configuration.
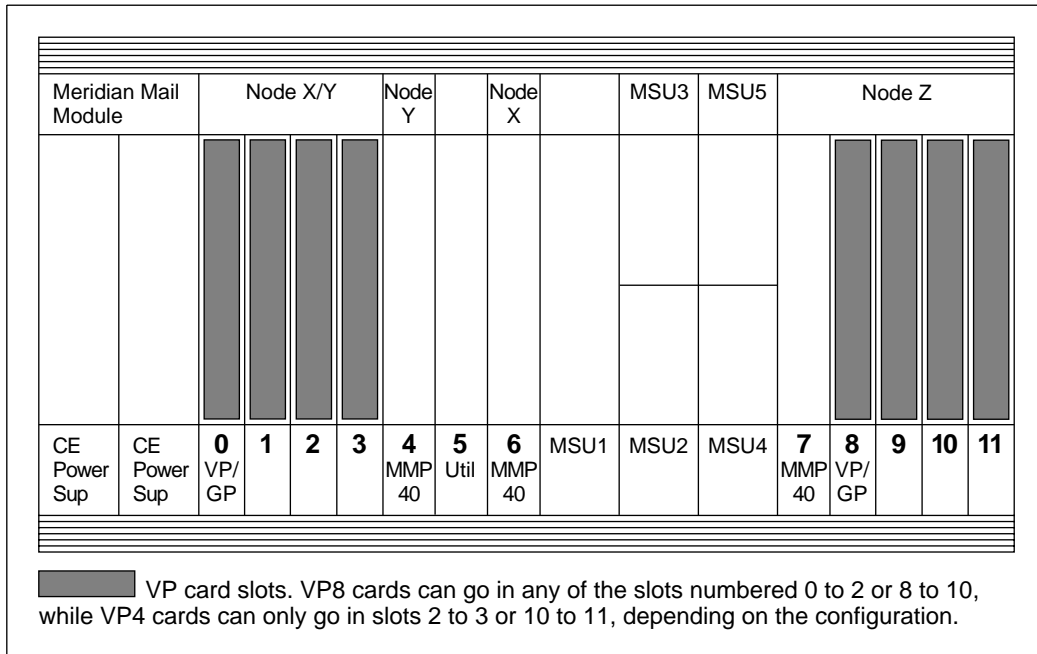
G100053

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

Chapter 9

Installing intramodule and intermodule cabling

In this chapter

Overview

Introduction   The following section shows how to route the intramodule and
                         intermodule cabling. You install all cable connections from the
                         rear of the cabinet inside the I/O cover.

                         Refer to the following table for a list of cables that are attached
                         to the backplane.

Cables required

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

                         Chapter 11, "Installing the Meridian Mail to PBX interface,"
                         deals with the network loop and AML cabling.

Intramodule and   The intramodule cabling procedure in this chapter describes the
intermodule cabling cabling between the backplane and the I/O panel. This includes
                         the backplane to I/O cables ("Installing I/O-to-backplane
                         cables" on page 9-9), and backplane to alarm/modem cables
                         ("Installing the alarm/modem cable" on page 9-9).

                         The intermodule cabling procedures describe the installation of
                         the external voice bus (EVB) cable between modules or
                         columns. The specific EVB cabling that you use depends on the
                         number of modules and whether there are one or two utility
                         cards.

                         The following procedures cover the combinations available:

                         • "Installing EVB cabling—two modules, one utility card"
                           on page 9-12

                         • "Installing EVB cabling—two modules, two utility cards"
                           on page 9-12

- "Installing EVB cabling—three modules, one utility card" on page 9-14

- "Installing EVB cabling—three modules, two utility cards" on page 9-15

Before you proceed with EVB cabling, make sure you follow the procedure for the number of modules and utility cards on the system. Refer to "Summary of cabling from backplane to I/O panel and other modules" on page 9-6. For an illustration, refer to "Backplane to I/O panel and next module cabling" on page 9-7.

References to modules MM0, MM1, and MM2

Interpret references to modules MM0, MM1, and MM2 as follows:

- The module that contains Meridian Mail node 1 is module MM0.

- The other module in any 2-module system is module MM1.

- In a 5-node shadowed system, the other module that contains two nodes (besides module MM0) is module MM1.

- The last module in a 5-node shadowed system is module MM2.

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

Extraction tool

Introduction   Follow the steps on the next page when you remove cables from
                          the backplane shrouds to avoid bending or breaking pins. Do
                          not insert the extraction tool unless the cable connector is
                          locked into the shroud. Do not force the extraction tool deeper
                          than the depth on the cable connector.

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

**Using the high-density   To use the high-density connector extraction tool, follow these
connector extraction   steps.
tool**

Step	Action
1	Grasp the cable connector by the strain relief tab.
2	Center the longer flat edge on the angled end of the tool between the cable connector and the wall of the shroud on the right side of the cable connector.

Angle this end between the cable connector and the wall of the shroud.

G100056
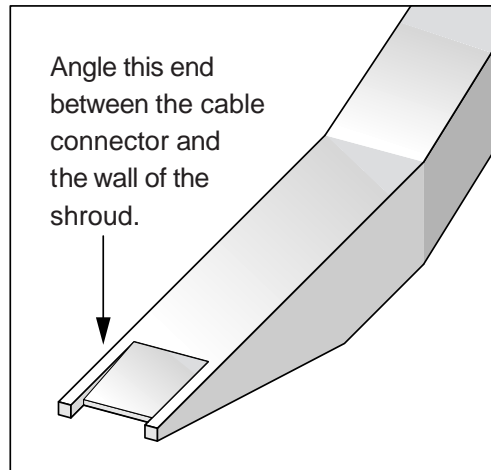
Note: If the straight end of the tool is notched, use that end if you can access the connector straight-on. If you must angle the tool at all, use the angled end.

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

> **CAUTION**
> **Risk of cable damage**
>
> You can damage the cable if you force the connector.

| 4 | Stop applying pressure as soon as the cable connector comes loose from the shroud. |
| 5 | Slowly remove the extraction tool and the cable connector. |

Summary of cabling from backplane to I/O panel and other modules

Figure reference	NT code	Cable	Routing summary
Cable a	NT6P0114 or NT6P0123	I/O to backplane	**5-port RS-232:** From shroud S5, I/O position, to the 5-RS-232 connector on the inside of the right I/O panel
			Note: The 5-port RS-232 cable NT6P0109 connects to the 5-RS-232 connector on the outside of the right I/O panel.
			4-port RS-232: From shroud S7, I/O position, to the 4-RS-232 connector on the inside of the left I/O panel
			Note: The 4-port RS-232 cable NT6P0110 connects to the 4-RS-232 connector on the outside of the left I/O panel.
Cable b	NT6P0112	Alarm/MDM	From J11 to the ALM/MDM connector on the right I/O panel
Cable c	NT6P0111 or NT6P0124 (76 cm, 30 in.) NT6P0118 or NT6P0125 (152 cm, 60 in.) NT6P0119 or NT6P0126 (244 cm, 96 in.)	External voice bus	This pair of cables connects modules. They run from shroud S7 on one module to shroud S5 or S7 on the next module, depending on whether the next module contains a utility card. Refer to the following procedures: "Installing EVB cabling—two modules, one utility card" on page 9-12 "Installing EVB cabling—two modules, two utility cards" on page 9-12 "Installing EVB cabling—three modules, one utility card" on page 9-14 "Installing EVB cabling—three modules, two utility cards" on page 9-15

Extraction tool

Backplane to I/O panel and next module cabling
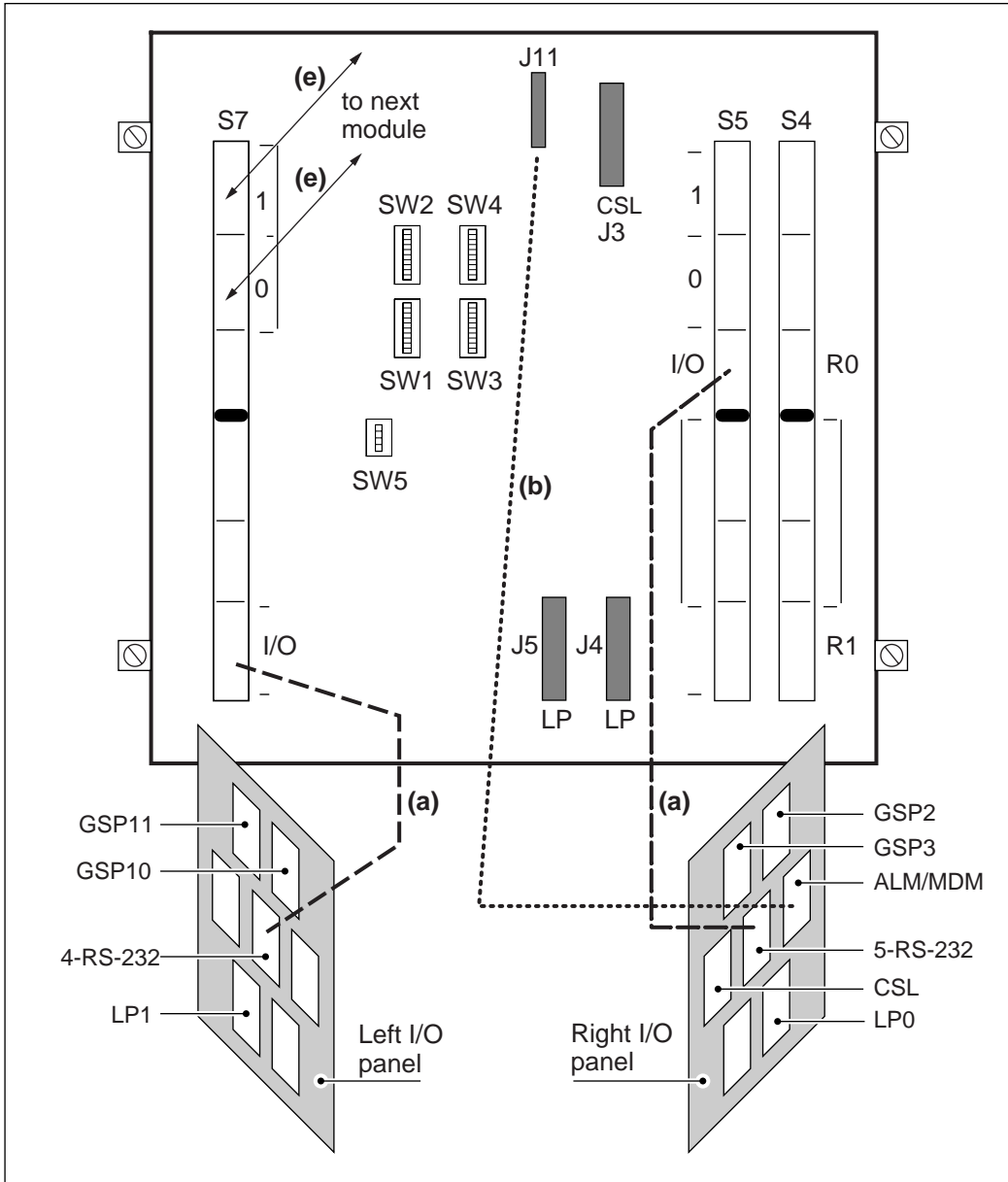
G100065

Installing cables from backplane to I/O panel

Introduction   The following procedures describe how to connect the 5-port and 4-port RS-232 cables and how to connect the alarm/modem cable from the backplane to the I/O panel.

CAUTION
Risk of equipment damage

I/O-to-backplane cables NT6P0123 and NT6P0114 have high-density connectors at the backplane end. You must install these connectors very carefully to avoid damaging the pins. Line up the connector at right angles to the backplane, and press gently until you hear a click. If you need to remove the cables, use an extraction tool (P0741489), and follow "Using the high-density connector extraction tool" on page 9-4.

Installing RS-232 cables

Introduction

You need two I/O-to-backplane cables (NT6P0123 or NT6P0114), one 5-port fanout cable (NT6P0109), and one 4-port fanout cable (NT6P0110) for each module, except for the last module in a 5-node shadowed system that does not use the 4-port cable. Refer to "Intermodule cabling for a two-module system" on page 9-13.

Installing I/O-to-backplane cables

To install the I/O-to-backplane cables, follow these steps.

Step	Action
1	Connect an I/O-to-backplane cable from the I/O position on shroud S5 to the 5-RS-232 connector on the inside of the right I/O panel.
2	Connect the end of an I/O-to-backplane cable from the I/O position on the shroud S7 to the 4-port RS-232 connector on the inside of the left I/O panel. *Note:* The connectors on the I/O panels are labeled differently on the inside and outside of the panel. Ensure that the I/O backplane cable is connected correctly. (See "Backplane to I/O panel and next module cabling" on page 9-7.)
3	**4-port RS-232 cable** Connect the single connector end of the 4-port fanout cable to the 4-RS-232 connector on the outside of the left I/O panel.
4	**5-port RS-232 cable** Connect the single connector end of the 5-port fanout cable to the 5-RS-232 connector on the outside of the right I/O panel.

Installing the alarm/modem cable

You need one alarm/modem cable (NT6P0112). Refer to "Backplane to I/O panel and next module cabling" on page 9-7.

To install the alarm/modem cable, follow these steps.

Step	Action
1	Connect one end of the cable to the J11 connector on the backplane.
2	Connect the other end of the cable to the ALM/MDM connector on the inside of the right I/O panel.

Intermodule bus cable connection

Installing the external voice bus cable

The EVB cable (NT6P0111/8/9 or NT6P0124/5/6) connects one module to another. The EVB cable does not come preinstalled with the system. The exact cabling depends on the number of modules and utility cards in the system and the relative location of one module to another. Refer to the following table to find the appropriate procedure for the system you are installing. If the system has two columns, also refer to "Installing EVB cables between columns" on page 9-16.

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

EVB cabling guide

Number of utility cards	Number of modules	Procedure to use
1	2	"Installing EVB cabling—two modules, one utility card" on page 9-12
2	2	"Installing EVB cabling—two modules, two utility cards" on page 9-12
1	3	"Installing EVB cabling—three modules, one utility card" on page 9-14
2	3	"Installing EVB cabling—three modules, two utility cards" on page 9-15

The EVB needs a terminator (NT6P0106) on the last module of a chain of modules, unless the last module contains a utility

card. In this case, the utility card on the last module acts as a terminator. See the appropriate procedure for details.

⚠️ **CAUTION**
Risk of equipment damage

External voice cables NT6P0111/8/9 and NT6P0124/5/6 have high-density connectors. You must install these connectors very carefully to avoid damage to the pins. Line up the connector at right angles to the backplane, and press gently until you hear a click. If you need to remove the cables, use an extraction tool (P0741489) and follow "Using the high-density connector extraction tool" on page 9-4.

Installing EVB cabling—two modules, one utility card

You need one pair of EVB cables (NT6P0111/8/9 or NT6P0124/5/6, depending on which length you need), and an EVB terminator (NT6P0106). See "Intermodule cabling for a three-module system" on page 9-15, diagram A.

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

Installing EVB cabling—two modules, two utility cards

Note: You do not need an EVB terminator in this configuration.

You need one pair of EVB cables (NT6P0111/8/9 or NT6P0124/5/6, depending on which length you need). See "Intermodule cabling for a two-module system" on page 9-13, diagram B.

To install EVB cabling for two modules and two utility cards, follow these steps.

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

Intermodule cabling for a two-module system

External voice bus cabling
Meridian Mail 2-module system

A. One utility card (module MM0 only)

S7   S5
Terminator
Module
MM1
1
0
I/O
I/O

S7   S5
Module
MM0
1
0
1
0
I/O
I/O

Rear view of modules

B. Two utility cards (modules MM0, MM1)

S7   S5
Module
MM1
1
0
1
0
I/O
I/O

S7   S5
Module
MM0
1
0
1
0
I/O
I/O

Rear view of modules

G100081
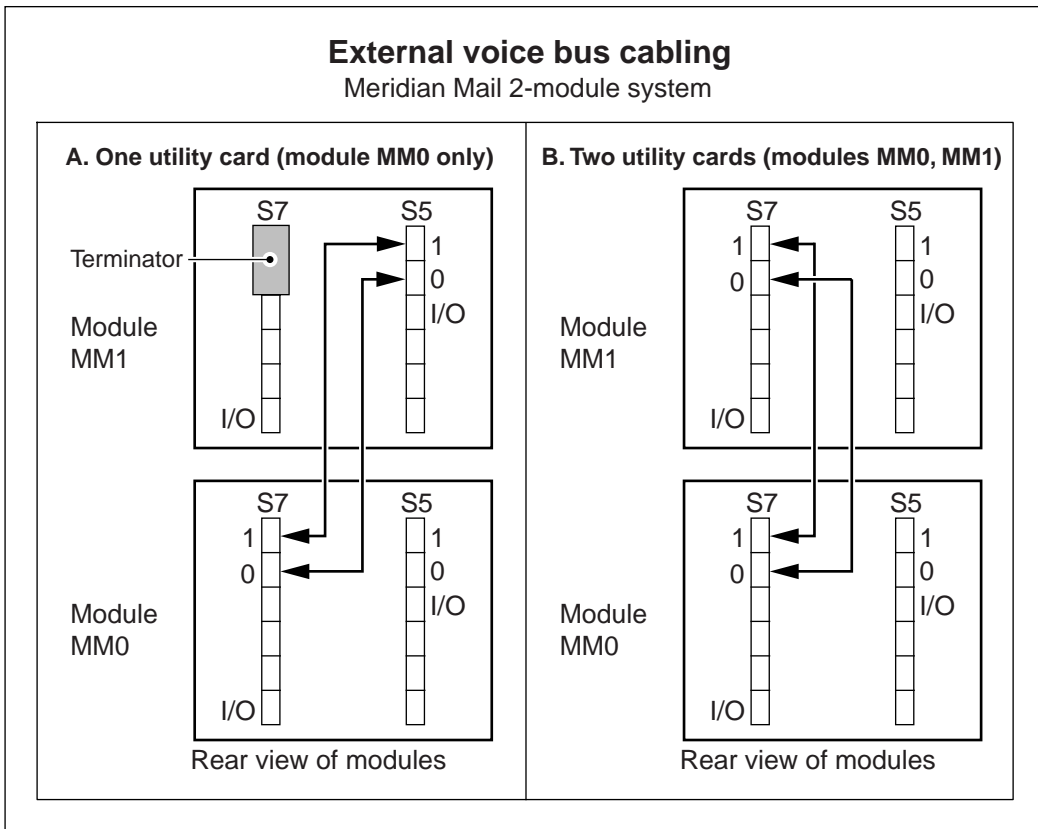
Installing EVB cabling—three modules, one utility card

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

Note: This is an unusual configuration. Normally, a 5-node system uses more than 48 ports, and needs three or four network loops and two utility cards.

You need two pairs of EVB cables (NT6P0111/8/9 or NT6P0124/5/6, depending on which length you need) and an EVB terminator (NT6P0106). See "Intermodule cabling for a three-module system" on page 9-15, diagram A.

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

Intermodule cabling for a three-module system

External voice bus cabling
Meridian Mail 3-module system

A. One utility card (module MM0 only)

Module MM2
S7 — Terminator
S5: 1, 0, I/O
I/O

Module MM1
S7: 1, 0, I/O
S5: 1, 0, I/O
I/O

Module MM0
S7: 1, 0, I/O
S5: 1, 0, I/O
I/O

Rear view of modules

B. Two utility cards (modules MM0, MM2)

Module MM2
S7: 1, 0, I/O
S5: 1, 0, I/O
I/O

Module MM1
S7: 1, 0, I/O
S5: 1, 0, I/O
I/O

Module MM0
S7: 1, 0, I/O
S5: 1, 0, I/O
I/O

Rear view of modules
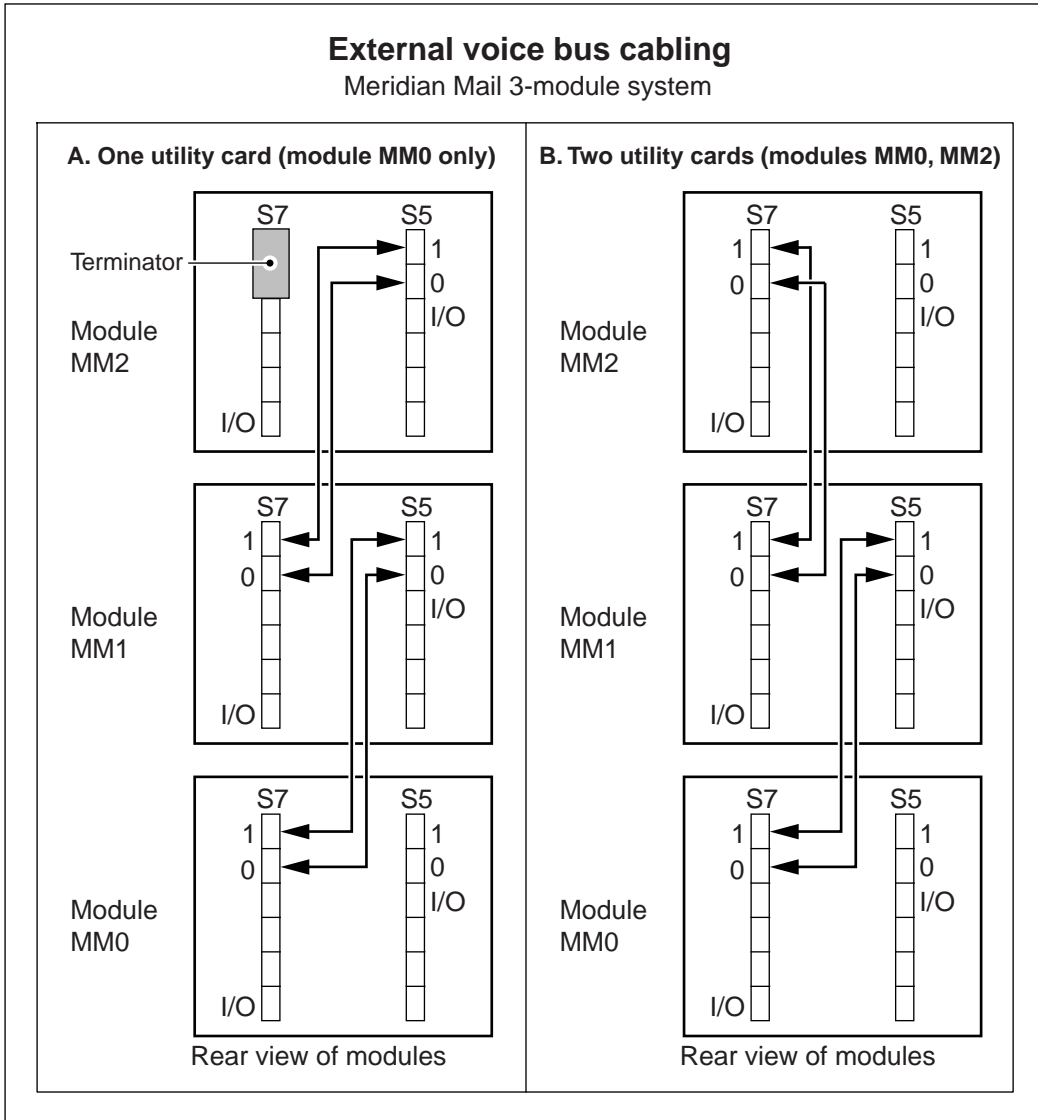
G100084

Installing EVB cabling—three modules, two utility cards

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

Note: You do not need an EVB terminator in this configuration.

You need two pairs of EVB cables (NT6P0111/8/9 or NT6P0124/5/6, depending on which length you require). See "Intermodule cabling for a three-module system" on page 9-15, diagram B).

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

Installing EVB cables between columns

The cabling between columns is identical to the intermodule cabling described in this chapter, with the following cabling restrictions:

- Cable routing follows the same routing restrictions for column-to-column interface as outlined in *SL-1 System Installation Procedures* (NTP 553-3001-210).

- Maximum cable length between modules is 244 cm (96 in.). EVB cabling comes in three lengths: 76 cm (30 in.), 152 cm (60 in.), and 244 cm (96 in.), with part numbers NT6P0111/8/9 or NT6P0124/5/6 respectively. Offset modules probably require the longer cables.

Chapter 10

Installing, cabling, and configuring peripheral devices

In this chapter

Overview

Introduction to peripheral devices

Peripheral devices for Meridian Mail include the following:

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

    *Note***:** To get full support from Nortel Networks, you must install an A/B switchbox and local modem, and connect the modem to a phone line. These devices allow Nortel Networks 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 use the Meridian Mail Reporter (MMR) package, refer to the *Meridian Mail Reporter 2.0 User's Guide* (P0847870) for MMR installation instructions.

Installation overview

Introduction   The cabling described here uses the rear I/O panels and the
4- and 5-port RS-232 fanout cables described in Chapter 9,
"Installing intramodule and intermodule cabling." Alternative
cabling that uses the main distribution frame (MDF) is
described later in this chapter.

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

1.   Installation of the A/B switchbox

2.   Installation and configuration of the administration
     terminal

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

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

5.   Installation of the local modem

6.   Installation of the remote terminal and modem, if used

7.   Installation of the Guest Administration Consoles (GACs)
     if you have the Hospitality feature

8.   Installation of networking modems, if used

Installing the A/B switchbox

You need the A/B switchbox to permit remote support by Nortel Networks. See "A/B switchbox for remote administration and maintenance" on page 10-5.

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

Step	Action
1	Place the A/B switchbox in a suitable location within 4.5 m (15 ft.) of Meridian Mail.
	Although the switchbox may not be exactly as indicated in this document, the installation is the same. See the instructions provided with the switchbox for specific details.
2	Set the switch on the front of the A/B switchbox to the "A" position.
	a. Label the A switch position "local."
	b. Label the other position "remote."

A/B switchbox for remote administration and maintenance
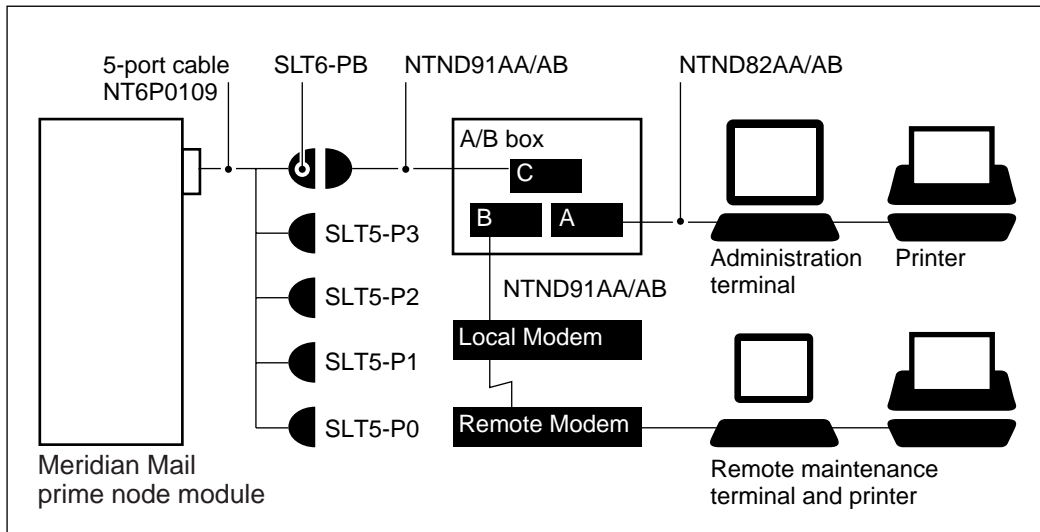
G100055

Installing the primary administration terminal and multiple user administration terminals

Introduction

Use the following procedure to install the primary administration terminal. Follow "Installing a MAT" on page 10-7 to install the multiple user administration terminals (MATs).

Installing the primary administration terminal

To install the primary administration terminal, follow these steps.

Step	Action
1	Place the administration terminal in a suitable location.
	Install the administration terminal within 15.2 m (50 ft.) of the Meridian Mail system. If the cable distance is greater than 15.2 m, use asynchronous limited distance modems (LDMs).
2	Connect the keyboard and power cord to the terminal.
3	Connect one end of a null modem terminal cable (NDND82AA/AB) to the COMM connector on the terminal, using an INMAC 328 adapter. Based on the type of terminal, you may also have to use a 6- to 25-pin adapter which is supplied with the terminal.
	If you are using an A/B switch, proceed directly to step 5; otherwise, proceed to step 4.
4	If you are not using an A/B switch, connect the other end of the cable to the connector labeled SLT6-PB on the 5-port fanout cable connected to the Meridian Mail right I/O panel. Proceed to step 6.
5	If you are using an A/B switch, see "A/B switchbox for remote administration and maintenance" on page 10-5.
	a. Connect the other end of the cable to the connector labeled A on the A/B switch.
	b. Connect one end of a straight RS-232 cable (NTND91AA/AB) to the 5-port RS-232 connector labeled SLT6-PB.
	c. Connect the other end of this cable to the common connector (usually marked C) of the A/B switchbox.

Step	Action
6	Plug the terminal power cord into an AC receptacle.
7	Power on the terminal.
8	Configure the terminal as described in Appendix A, "Terminal configuration," for your type of terminal.

Installing a MAT

Up to three MATs connect to connectors on a 4- or 5-port RS-232 fanout cable. Only one MAT is allowed on any node. If node 1 has two GACs, it may not also have a MAT.

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

To install a MAT, follow these steps.

Step	Action
1	Place the terminal in a suitable location within 15.2 m (50 ft.) of the Meridian Mail system. If the cable distance is greater, you need a pair of limited distance modems (LDMs).
2	Connect the keyboard and power cord to the terminal.
3	Connect one end of the null modem terminal cable (NDND82AA/AB) to the COMM connector on the terminal, using an INMAC 328 adapter. Based on the type of terminal, you may also have to use a 6- to 25-pin adapter, which is supplied with the terminal.
4	Connect the other end of the cable to a connector labeled SLT5-Px on the 5-port fanout cable connected to the Meridian Mail right I/O panel, or SLT4-Px on the 4-port fanout cable connected to the Meridian Mail left I/O panel. This connector, x, must correspond to a port that has been configured for a MAT. *Note:* See "Ports for peripheral devices in an unshadowed system" on page 10-32, or "Ports for peripheral devices in a shadowed system" on page 10-34 for the correspondence between fanout cable connector labels and ports configured during system installation or modification. See "Modify hardware" in *System Administration Tools* (NTP 555-7001-305) for recommended dataport usage.

Step	Action
5	Plug the terminal power cord into an AC receptacle.
6	Power on the terminal.
7	Configure the terminal as described in Appendix A, "Terminal configuration," for your type of terminal.

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

Installing and configuring the Digital printers

Introduction

Meridian Mail supports the following two Digital printers:

- LA75 Plus Companion
- LA30^N Companion

Install the LA75 Plus Companion or LA30^N Companion printer as described below. Configure the printer as described in "Configuring the LA75 Plus Companion printer" on page 10-12 if you are using the LA75 Plus Companion or "Configuring the LA30^N Companion printer" on page 10-14 if you are using the LA30^N Companion printer. Note that the required cables and adapters vary with the type of terminal you are using.

Connecting the LA75 Plus Companion or LA30^N Companion printer

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

Step	Action
1	Place the printer in a suitable location near the administration terminal.
2	Connect the power cord to the printer.
3	Connect one end of the BC16E-10 interface cable to the back of the printer. See "LA75 Plus Companion and LA30^N Companion printer connections to administration terminals" on page 10-11.
4	Connect the other end of the cable, using adapters and cables as needed, to the terminal. See "LA75 Plus Companion and LA30^N Companion printer connections to administration terminals" on page 10-11 for details of the required cables and adapters.

Step	Action
5	Plug the printer power cord into an AC receptacle.
6	Leave the printer powered off to start configuration.
7	Configure the printer as described in "Configuring the LA75 Plus Companion printer" on page 10-12 if you are using the LA75 Plus Companion, or "Configuring the LA30^N Companion printer" on page 10-14 if you are using the LA30^N Companion printer.

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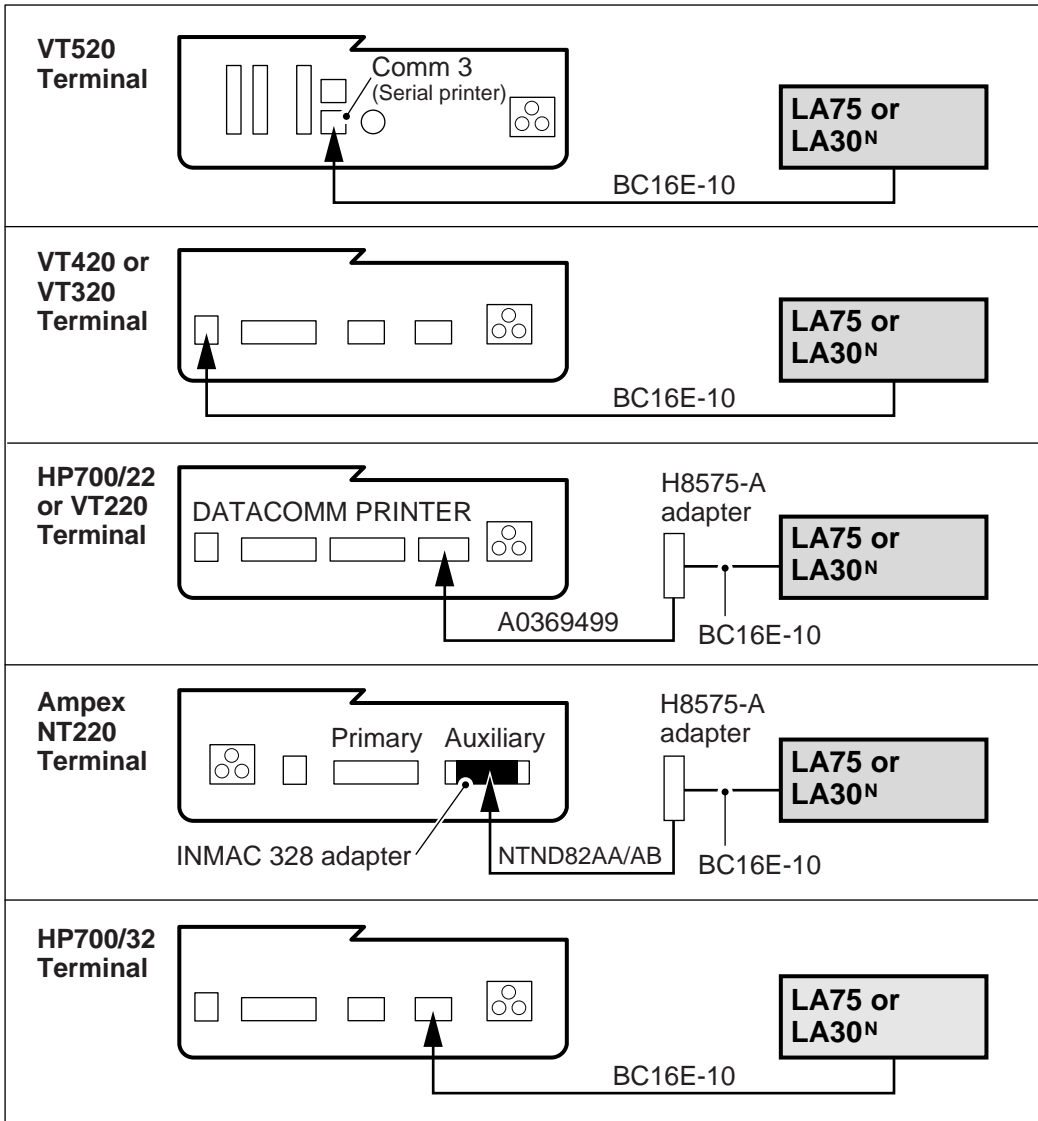
G100619

Configuring the LA75 Plus Companion printer

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

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

Step	Action
1	Ensure that the printer is turned off.
2	Press and hold the Set-up button on the front control panel of the printer and, *at the same time*, power on the printer.
3	Release the Set-up button one to two seconds after you power on. See the following illustration for the layout of the front panel.
	The printer automatically prints out a list of the default settings. When the list is complete, the printer goes back to the beginning of the list, reprints the first setting, and stops (that is, it goes back to "Generic 1" and stops).

Front control panel on the LA75 Plus Companion printer
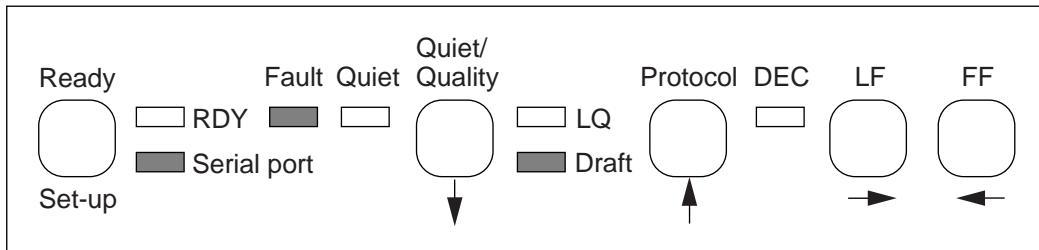
G100076

Step	Action
4	If you want to change the value of the current setting, press the left arrow key on the front of the printer. See "LA75 printer default settings" on page 10-13 for the required values.
	The current feature number is printed again with the new value.
5	If this is not the value you require, press the left arrow key again. The next value for that feature number is printed.
	Refer to the user manual that is provided with the printer for the list of values available for each feature.

6   Repeat step 5 until the value that you want for this feature is printed. Press the down arrow key to move on to the next feature.

7   Repeat steps 5 and 6 until you have selected the required values for all of the features.

8   Press the Set-up button on the front of the printer to save the settings.

LA75 printer default settings

Feature number	Name	Required value	Meaning
Generic 1	Protocol at Power-up	3	Port dependent
Generic 2	Form length	9	27.94cm [11 in. (A)]
Generic 3	Vertical pitch	4	6 lines per 2.54 cm (1 in.)
Generic 4	Automatic advance	1	Selected
Generic 5	Print quality control	1	Software control
Generic 6	Port selection	1	Serial port
Generic 7	Baud rate	7	9600
Generic 8	Data bits and parity	7	8-None
Generic 9	Buffer Control	1	XON/XOFF
Generic 10	Error beep	1	One beep
Generic 11	Typestyle	1	Internal
Generic 12	Input buffer size	1	8K
Generic 13	Disconnect on fault	1	Not selected
DEC 1	Horizontal pitch	7	10 characters per 2.54 cm (1 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

LA30^N Companion printer

Introduction

The LA30^N Companion printer ships with default settings that are ready to be used with terminals configured according to Appendix A, "Terminal configuration." These settings are stored in MACRO 1. Verify that your printer is set to use MACRO 1 settings.

Use the following steps to configure the LA30^N Companion printer if the factory defaults have been changed.

Configuring the LA30^N Companion printer

To configure the LA30^N Companion printer, follow these steps.

Step	Action
1	Ensure the configurations of the administration terminal are set as follows: Speed=9600 Receive=Transmit Databit=8 bits Parity=None Stop=1 stop bit
2	Ensure that the continuous forms paper set on the tractors is loaded and that the paper select lever is set backward.
3	Turn off the printer.
4	Turn on the printer while you hold the Set-Up/Quit button until the printer beeps.

Control Panel

● Draft	● Courier 10	● Bold PS		● Fault
● HSDraft	● Prestige 12	● Time PS		● DEC ─┐
● HiDraft	● Comp. 17	● Nimb. PS	● M1	● PPX24 ─┘ EP2
	● Ready	● Soft Ctrl.	● M2	

Pause   Font   Macro   Protocol   Park   LF   FF/Load

○   ●   ○   ○ M1   ○ M2   ○   ○

Set-up/Quit   Top   Exit/Save
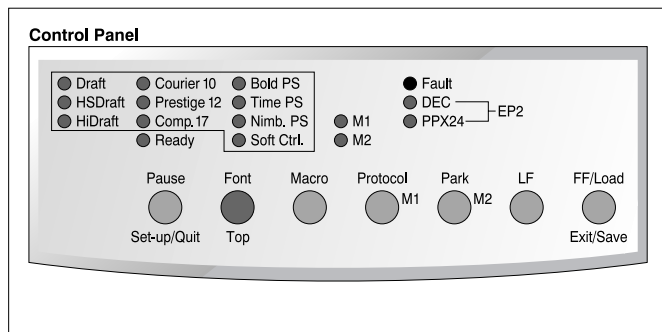
G100620

Step	Action
5	Remove the acoustic cover to see the printed text.

When the printer enters set-up mode, it prints a header menu, help menu, and <Functions> menu, and the M1 and M2 indicators flash alternately.

The header menu tells you that the printer is in set-up mode; the help menu provides a quick summary of how to use the buttons in set-up mode; and the <Functions> menu lists all of the available functions in this mode. Refer to the table below for a listing of available functions.

Functions available in Set-up mode

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

LA30^N printer default settings

Print feature	Factory setting
Protocol	Port dependent
Protocol serial	DEC
Port parallel	EPSON
Font	Draft
Horizontal pitch	10 cpi
Vertical pitch	6 lpi
Form length	27.94 cm [11 in. (A)]
Left margin	1 column
Top of form*	0/60 inch
Top margin	1 line
Bottom margin	66 lines
Line mode	LF=LF, CR=CR
Paper source¤	Tractor
Print direction	Soft control
DEC mode	
DEC printer ID	PPL2
Auto wrap	Wrap
EOT disconnect	No disconnect on EOT
Initial report	No
Auto answerback	No
Answerback on ENQ	No
DEC GO character set	US ASCII
DEC user preference character set	DEC Supplemental
IBM and Epson mode	
Default Character set	CP 437
IBM mode	

Print feature	Factory setting
IBM set 1 or 2	IBM set 1
IBM double height	No
IBM AGM	No
Epson mode	
Epson national character set	USA

* When you change the Macro selection and the new Top-of-Form value is different from the former, paper automatically feeds to the next page, using the new Top-of-Form value.

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

Installing and configuring the HP Thinkjet printer

Installing the HP Thinkjet printer

To install the HP Thinkjet printer, follow these steps.

Step	Action
1	Place the printer near the administration terminal.
2	Connect the power cord to the printer.
3	Connect one end of the appropriate cable to the back of the printer. See "HP Thinkjet printer connections to administration terminals" on page 10-19.
4	Connect the other end of the cable, using an adapter if needed, to the administration terminal. See "HP Thinkjet printer connections to administration terminals" on page 10-19 for details of the required cables and adapters.
5	Set the printer switches as shown in "HP Thinkjet printer mode switch settings" on page 10-20 and "Printer RS-232 switch settings" on page 10-20. "HP Thinkjet printer switch locations" on page 10-20 shows the location of the switches.
6	Plug the printer power cord into an AC receptacle.
7	Power on the printer.

HP Thinkjet printer connections to administration terminals

VT520 terminal — BC16E-10 — ThinkJet

VT420 or VT320 terminal — A0376171 — ThinkJet

HP700/22 or VT220 terminal — DATACOMM PRINTER — A0369499 — ThinkJet

Ampex NT220 terminal — Primary — Auxiliary — INMAC 328 adapter — NTND82AA/AB — ThinkJet

HP700/32 terminal — A0376171 — ThinkJet
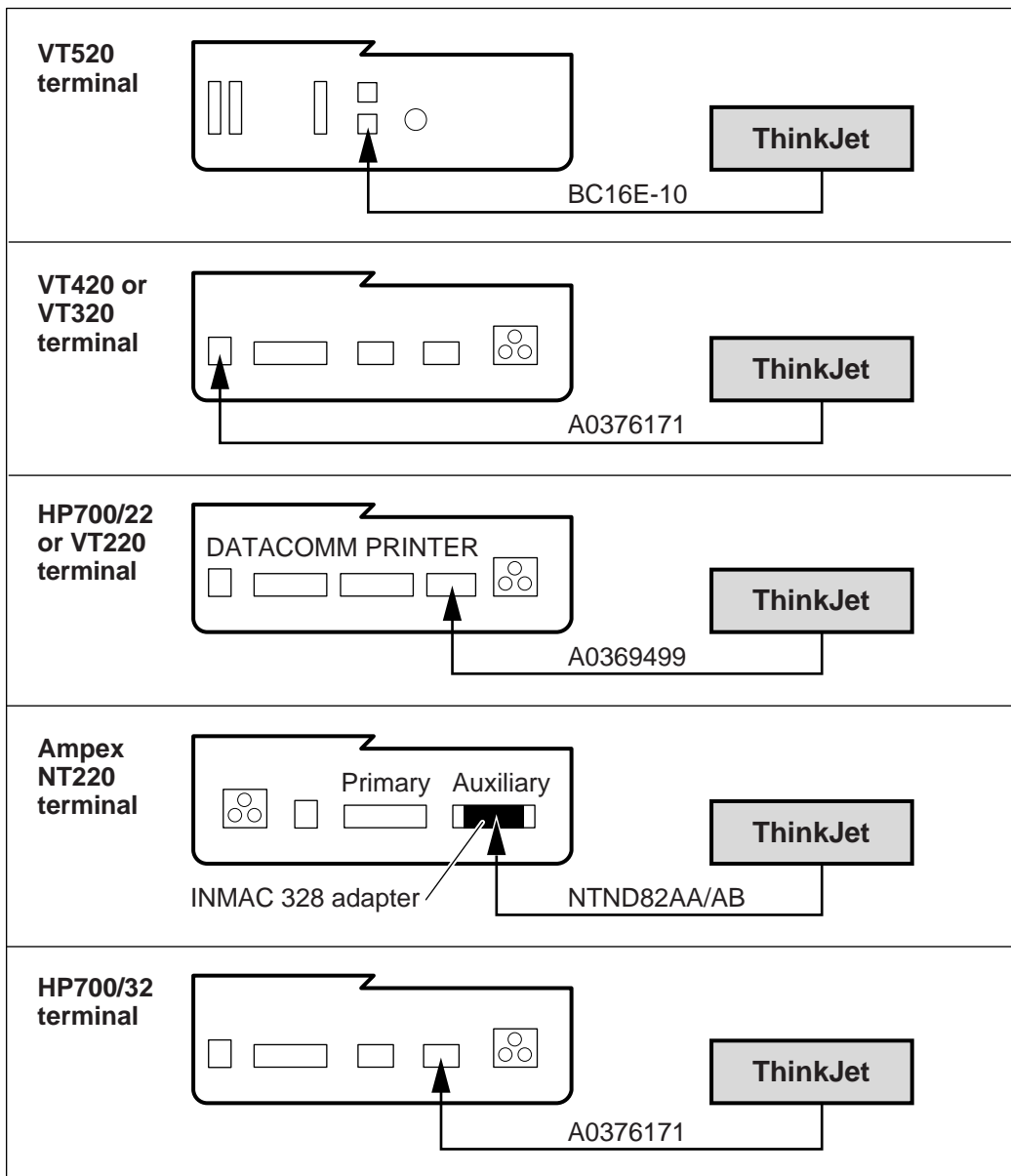
g101075

HP Thinkjet printer switch locations
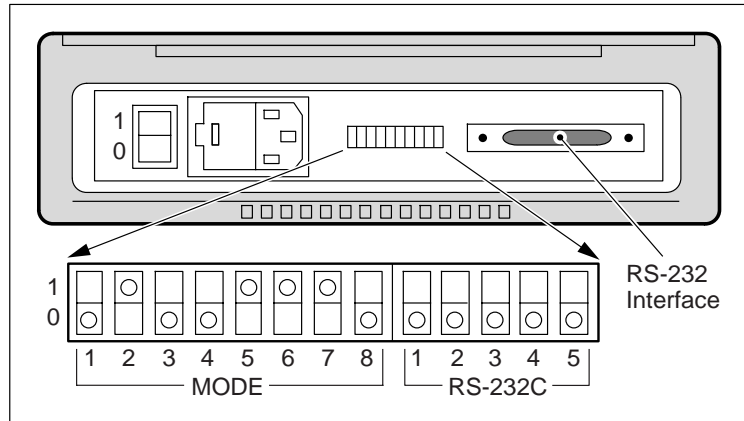
G100079

HP Thinkjet printer mode switch settings

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

Printer RS-232 switch settings

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

Installing and configuring local modems

Introduction   The following table lists the modem models that are supported in Meridian Mail Release 13 for local use, and the baud rate at which they can operate.

Supported modems

	Local modem	
	2400 bps	**9600 bps**
U.S. Robotics Sportster 14.4	✔	✔
Racal ALM 3223	✔	✔
Hayes Optima 144	✔	✔
UDS 2440	✔	✔
UDS EC 224 A/D	✔	✔
Ven-Tel 2400-33/2400 Plus II	✔	✔
Ven-Tel 9600 Plus/9600 Plus II	✔	✔

To install and configure the local modem, refer to Appendix B, "Modem configurations."

Installing and configuring remote modems

Introduction   The following table lists the modem models that are supported
                           in Meridian Mail Release 13 for use as remote-access modems,
                           and the baud rate at which they can operate.

Supported modems

	Remote-access modem	
	2400 bps	**9600 bps**
U.S. Robotics Sportster 14.4	✔	✔
Racal ALM 3223	✔	✔
Hayes Optima 144	✔	✔
UDS 2440	✔	✔
UDS EC 224 A/D	✔	✔
Ven-Tel 2400-33/2400 Plus II	✔	✔
Ven-Tel 9600 Plus/9600 Plus II	✔	✔

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

Step	Action
1	Place the terminal and the modem in a suitable location.
2	Connect the keyboard and power cord to the terminal, and the power cord to the modem.
3	Connect one end of a straight-through RS-232 cable to the COMM connector on the terminal, via an INMAC 328 adapter. Based on the type of terminal, you may also have to use a 6- to 25-pin adapter, which is supplied with the terminal.
4	Connect the other end to the modem.
5	Plug the terminal and modem power cords into an AC receptacle.
6	Power on the terminal and the modem.

Step	Action
7	Configure the terminal as described in Appendix A, "Terminal configuration," for your terminal.
8	If you did not already configure the modem, do so now. Refer to Appendix B, "Modem configurations," for configuration procedures for your modem type.
9	Connect the modem to the phone line used to dial in for remote administration.

Installing and configuring the Guest Administration Console

Introduction   Use the following steps to install and configure the Guest
                            Administration Console (GAC).

                            Note 1: You must have the Hospitality feature installed.

                            Note 2: You can connect up to two GACs to node 1. You can
                            connect only one GAC to any other node. The maximum
                            number of GACs allowed for an entire system is four.

                            Note 3: If node 1 has a multiple administration terminal (MAT),
                            you can connect only one GAC to the node.

Installing a GAC   To install a GAC, follow these steps.

Step	Action
1	Connect one end of a null modem cable (NTND82AA/AB) to a connector labeled SLT5-P*x* on the 5-port fanout cable connected to the Meridian Mail right I/O panel. See "GAC terminal" on page 10-25. Alternatively, you can connect the null modem cable to the SLT4-P*x* on the 4-port fanout cable connected to the Meridian Mail left I/O panel.
	This connector, x, must correspond to a port that has been configured for a GAC.
	See "Ports for peripheral devices in an unshadowed system" on page 10-32, or "Ports for peripheral devices in a shadowed system" on page 10-34 for the correspondence between fanout cable connector labels and ports configured during system installation or modification. See *System Administration Tools* (NTP 555-7001-305) for recommended dataport usage.
2	Connect the other end to the "Comm" connection on the GAC.

Step	Action
3	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, "Terminal configuration." **Note:** You should have configured a port at software installation time for each GAC. If this was not done, you must reconfigure the ports from the administration terminal. Go to the Tools level on the MMI, and select "Configure GACs" to configure ports as GACs. See *System Administration Tools* (NTP 555-7001-305).

GAC terminal
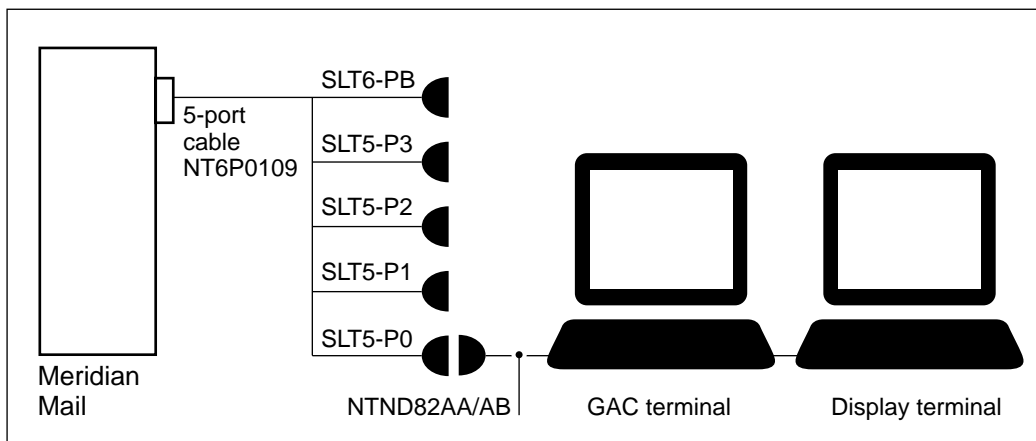
G100054

Installing a networking modem

To install a networking modem, follow these steps.

Step	Action
1	Connect one end of a null modem cable to a connector labeled SLT5-P*x* on the 5-port fanout cable connected to the Meridian Mail right I/O panel.
	This connector, x, must correspond to a port that has been configured for a networking modem.
	See "Ports for peripheral devices in an unshadowed system" on page 10-32, or "Ports for peripheral devices in a shadowed system" on page 10-34 for the correspondence between fanout cable connector labels and ports configured during system installation or modification. See *System Administration Tools* (NTP 555-7001-305) for recommended dataport usage.
2	Connect the other end to the RS-232/EIA connection on the modem.
3	Configure the modem as described in the *Meridian Networking Installation and Administration Guide* (NTP 555-7001-244).

Bix block cabling for peripheral devices

Introduction   The following section outlines the Bix block designations and
cabling for the peripheral devices. You can cable peripherals
through the main distribution frame (MDF) as an alternative to
using the 4- and 5-port fanout cables for any module; this is the
normal method of cabling the alarm connections from module
MM0. See "Connecting the alarm to the main distribution
frame" on page 10-30.

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

"ALM/MDM and 4- and 5-port RS-232 Bix block tip, ring, pin,
and pair colors" on page 10-28 lists tip, ring, pin, and pair color
information for the ALM/MDM cable, and the equivalents for
the 4- and 5-port fanout cables.

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

ALM/MDM and 4- and 5-port RS-232 Bix block tip, ring, pin, and pair colors

Pair	Pin	Pair Color	Bix Label P0736930	Bix Label P0736931	
			Alarm & modem	**4-port RS-232**	**5-port RS-232**
1T	26	W-BL	T MDM	RXD Slot 4	RXD Slot 5
1R	1	BL-W	R MDM	GRD, Port B	GRD, Port 0
2T	27	W-O	FRM	CTS Slot 4	CTS Slot 5
2R	2	O-W	GRD	TXD, Port B	TXD, Port 0
3T	28	W-G	NC Minor	DSR Slot 4	DSR Slot 5
3R	3	G-W	CM Minor	RTS, Port B	RTS, Port 0
4T	29	W-BR	CM Crit	DCD Slot 4	DCD Slot 5
4R	4	BR-W	NO Minor	DTR, Port B	DTR, Port 0
5T	30	W-S	Power Monitor	RXC Slot 4	RXC Slot 5
5R	5	S-W	NC Crit	TXC, Port B	TXC, Port 0
6T	31	R-BL	NC Major	RXD Slot 7	RXD Slot 5
6R	6	BL-R	CM Major	GRD, Port B	GRD, Port 2
7T	32	R-O	NO Crit	CTS Slot 7	CTS Slot 5
7R	7	O-R	NO Major	TXD, Port B	TXD, Port 2
8T	33	R-G	Spare	DSR Slot 7	DSR Slot 5
8R	8	G-R	Spare	RTS, Port B	RTS, Port 2
9T	34	R-BR	Spare	DCD Slot 7	DCD Slot 5
9R	9	BR-R	Spare	DTR, Port B	DTR, Port 2
10T	35	R-S	Spare	RXC Slot 7	RXC Slot 5
10R	10	S-R	Spare	TXC, Port B	TXC, Port 2
11T	36	BK-BL	Spare	RXD Slot 4	RXD Slot 5
11R	11	BL-BK	Spare	GRD, Port A	GRD, Port 1
12T	37	BL-O	Spare	CTS Slot 4	CTS Slot 5
12R	12	O-BL	Spare	TXD, Port A	TXD, Port 1
13T	38	BK-G	Spare	DSR Slot 4	DSR Slot 5
13R	13	G-BK	Spare	RTS, Port A	RTS, Port 1

Bix block cabling for peripheral devices

Pair	Pin	Pair Color	Bix Label P0736930	Bix Label P0736931	
			Alarm & modem	4-port RS-232	5-port RS-232
14T	39	BK-BR	Spare	DCD Slot 4	DCD Slot 5
14R	14	BR-BK	Spare	DTR, Port A	DTR, Port 1
15T	40	BK-S	Spare	RXC Slot 4	RXC Slot 5
15R	15	S-BK	Spare	TXC, Port A	TXC, Port 1
16T	41	Y-BL	Spare	RXD Slot 7	RXD Slot 5
16R	16	BL-Y	Spare	GRD, Port A	GRD, Port 3
17T	42	Y-O	Spare	CTS Slot 7	CTS Slot 5
17R	17	O-Y	Spare	TXD, Port A	TXD, Port 3
18T	43	Y-G	Spare	DSR Slot 7	DSR Slot 5
18R	18	G-Y	Spare	RTS, Port A	RTS, Port 3
19T	44	Y-BR	Spare	DCD Slot 7	DCD Slot 5
19R	19	BR-Y	Spare	DTR, Port A	DTR, Port 3
20T	45	Y-S	Spare	RXC Slot 7	RXC Slot 5
20R	20	S-Y	Spare	TXC, Port A	TXC, Port 3
21T	46	V-BL	Spare	TXCD Slot 4	RXD Slot 6
21R	21	BL-V	Spare	RI, Port A	GRD, Port B
22T	47	V-O	Spare	TXCD Slot 7	CTS Slot 6
22R	22	O-V	Spare	RI, Port A	TXD, Port B
23T	48	V-G	Spare		DSR Slot 6
23R	23	G-V	Spare		RTS, Port B
24T	49	V-BR	Spare		DCD Slot 6
24R	24	BR-V	Spare		DTR, Port B
25T	50	V-S	Spare		RXC Slot 6
25R	25	S-V	Spare		TXC, Port B

Connecting the alarm to the main distribution frame

Right I/O panel

Backplane to I/O cable

ALM/MDM connector

Meridian Mail prime node module

NEA25B 25-pair cable

Bix block | C M | N C | N O

Alarm cable

Alarm device

Note: This example shows an alarm connected to normally open contacts (NO and CM). Another type of alarm may need to be connected to normally closed contacts (NC and CM).
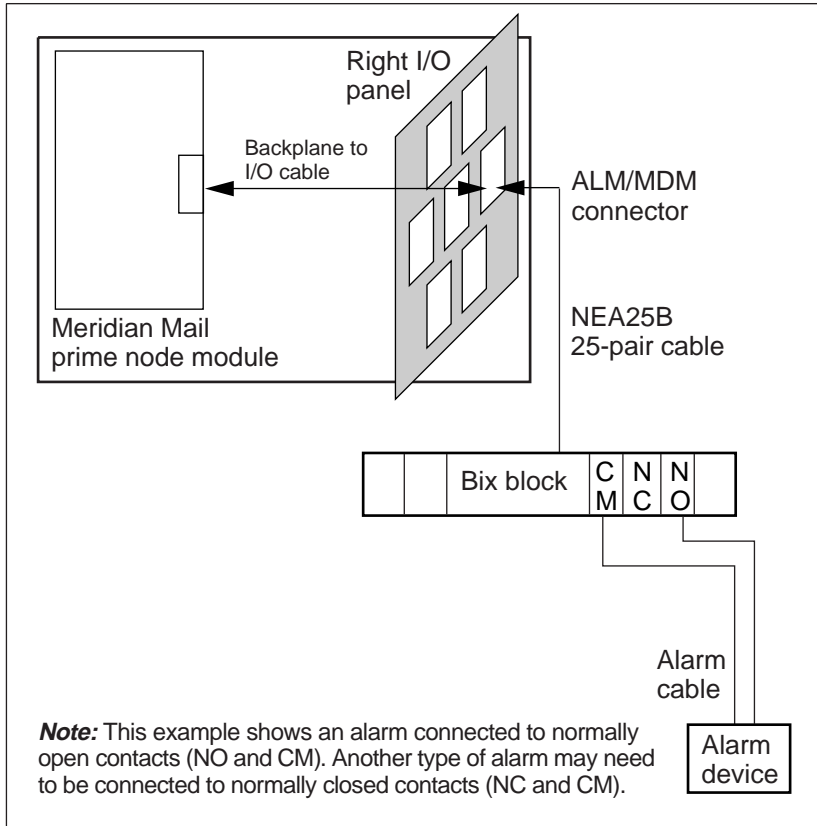
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Ports for peripheral devices in an unshadowed system

```
AML (a)          X          MDM & ALM  (c)                    MDF
                 Node 1
MSDL or
ESDI                        Null modem cable (g)              Terminal
QPC414                                        SLT6-PB
network          Z          5-port          SLT5-P0
card             Node 2     RS-232          SLT5-P1                (h)
                            (d)             SLT5-P2
          (b)                               SLT5-P3
Network loop     Y
interfaces       Node 3                     SLT4-PA
                            4-port          SLT7-PA
Meridian Mail               RS-232          SLT4-PB            Printer
module MMO                  (e)             SLT7-PB*

          EVB (f)    (f) EVB
                 X                           SLT6-PB*
                 Node 4     5-port          SLT5-P0
                            RS-232          SLT5-P1     Not configured
                            (d)             SLT5-P2     unless there is
                                            SLT5-P3     a utility card in
                 Z                                      module MM1
                 Node 5
Meridian Mail                               SLT4-PA
module MM1                  4-port          SLT7-PA
                            RS-232          SLT4-PB
                            (e)             SLT7-PB*
```

(a) AML cable
(b) Network loop cable
(c) Modem and alarm cable
(d) 5-port RS-232 fanout cable

(e) 4-port RS-232 fanout cable
(f) External voice bus cable
(g) Null modem cable
(h) Printer cable

---

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

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Ports for peripheral devices in an unshadowed system

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

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

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

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

Ports for peripheral devices in a shadowed system

(a) AML cable
(b) Network loop cable
(c) Modem and alarm cable
(d) 5-port RS-232 fanout cable

(e) 4-port RS-232 fanout cable
(f) External voice bus cable
(g) Null modem cable
(h) Printer cable

*Terminal may be connected for Enhanced MMP40 or MMP40 verification during node expansion.
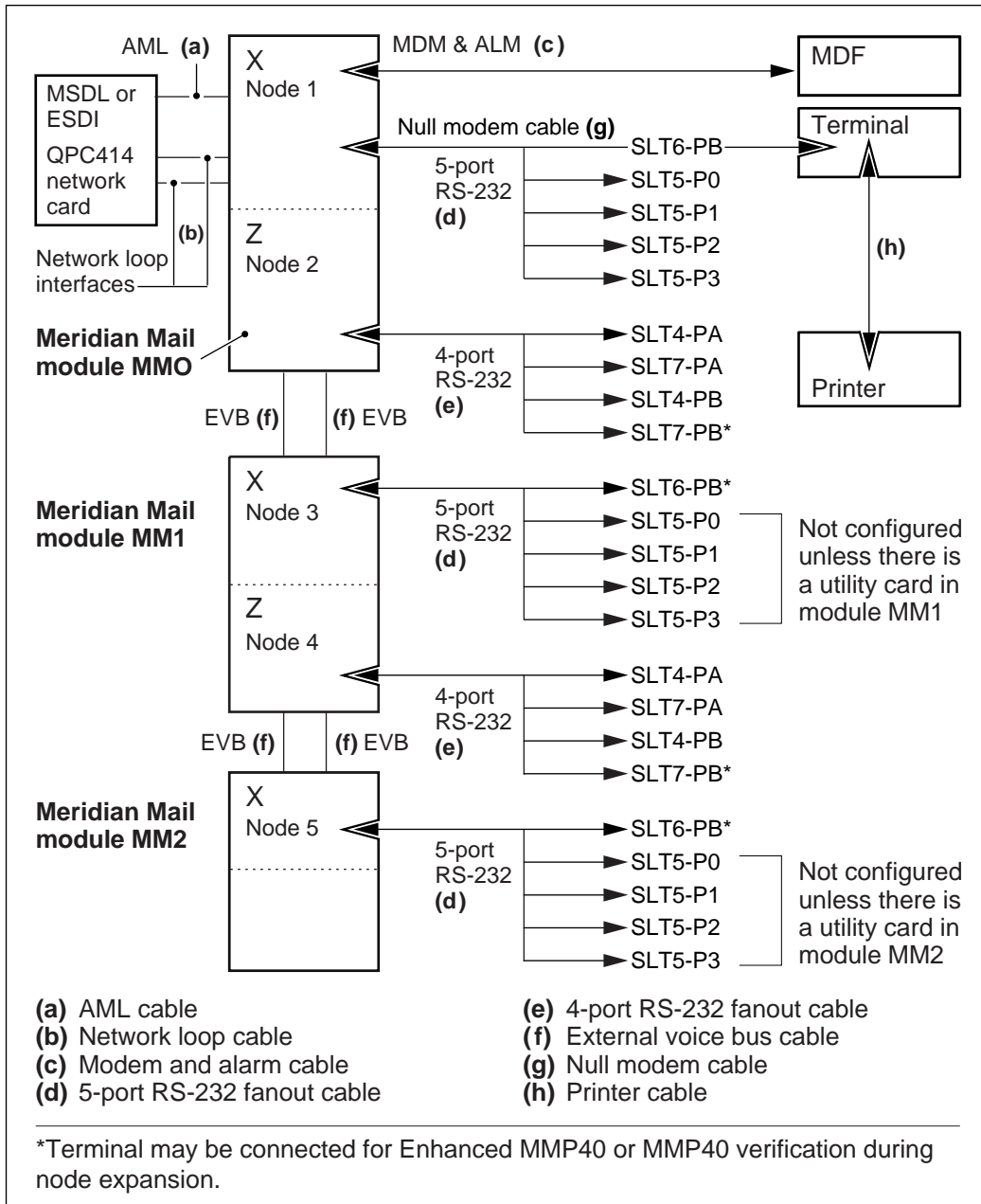
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Ports for peripheral devices in a shadowed system

Module	Cable	Card slot	Connector	Dataport designation in software installation	Hardware administration modify node screen
MM0	CSL	6 Enhanced MMP40	CSL	Node 1, SBC* Card, Port 2	Node 1, Card 7, Port 2
	5-port	6 Enhanced MMP40	SLT6 PB	Node 1, SBC* Card, Port 1	Node 1, Card 7, Port 1
		5 Util	SLT5 P0	Node 1, UTIL Card, Port 1	Node 1, Card 6, Port 1
			SLT5 P1	Node 1, UTIL Card, Port 2	Node 1, Card 6, Port 2
			SLT5 P2	Node 1, UTIL Card, Port 3	Node 1, Card 6, Port 3
			SLT5 P3	Node 1, UTIL Card, Port 4	Node 1, Card 6, Port 4
	4-port	7 (Z0) Enhanced MMP40	SLT7 PB	Node 2, SBC* Card, Port 1	Node 2, Card 1, Port 1
			SLT7 PA	Node 2, SBC* Card, Port 2	Node 2, Card 1, Port 2
		4 Enhanced MMP40	SLT4 PB	not configured	not configured
			SLT4 PA	not configured	not configured
MM1	5-port	6 Enhanced	SLT6 PB	Node 3, SBC* Card, Port 1	Node 3, Card 7, Port 1
		5 Util ports configured only if a UTIL card is installed	SLT5 P0	Node 3, UTIL Card, Port 1	Node 3, Card 6, Port 1
			SLT5 P1	Node 3, UTIL Card, Port 2	Node 3, Card 6, Port 2
			SLT5 P2	Node 3, UTIL Card, Port 3	Node 3, Card 6, Port 3
			SLT5 P3	Node 3, UTIL Card, Port 4	Node 3, Card 6, Port 4
	4-port	7 (Z0) Enhanced MMP40	SLT7 PB	Node 4, SBC* Card, Port 1	Node 4, Card 1, Port 1
			SLT7 PA	Node 4, SBC* Card, Port 2	Node 4, Card 1, Port 2
			SLT4 PB	not configured	not configured
			SLT4 PA	not configured	not configured
MM2	5-port	6 Enhanced MMP40	SLT6 PB	Node 5, SBC* Card, Port 1	Node 5, Card 7, Port 1
		5 Util ports configured only if a UTIL card is installed	SLT5 P0	Node 5, UTIL Card, Port 1	Node 5, Card 6, Port 1
			SLT5 P1	Node 5, UTIL Card, Port 2	Node 5, Card 6, Port 2
			SLT5 P2	Node 5, UTIL Card, Port 3	Node 5, Card 6, Port 3
			SLT5 P3	Node 5, UTIL Card, Port 4	Node 5, Card 6, Port 4
	4-port			not configured	not configured
Note: UTIL card ports are configured in module MM1 or MM2 only if a utility card is installed in that module.					
* The dataport designation is: Node x Enhanced MMP40 card Port y					

Chapter 11

Installing the Meridian Mail to PBX interface

In this chapter

Overview

Introduction

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

- a network loop for every 24 channels from Meridian Mail to the Meridian 1. For information on how to install the network card and the loop hardware, refer to "Establishing the network loop connection between Meridian Mail and the Meridian 1" on page 11-3.
- an AML data link from the Meridian Mail prime node to the Meridian 1. For information on how to install either the MSDL or ESDI card and the AML cabling, refer to "Establishing the AML connection between Meridian Mail and the Meridian 1" on page 11-11.

Chapter 12, "Configuring the Meridian 1," discussses the Meridian 1 programming needed to support the network connection and the AML links.

Reference documentation

You need the following Meridian 1 documents:

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

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

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

Introduction

You can use Meridian Mail with any dedicated Meridian 1 network loop with TNs available for Meridian Mail usage. Each Meridian Mail port requires a TN. The VP4 or VP8 cards on the system can accommodate four and eight TNs respectively.

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

The following table lists the cables required, and their respective connections, for installation of the network loop. These cables are shown in "Network loop cabling between Meridian Mail and Meridian 1" on page 11-6. A diagram of the AML cabling between Meridian Mail and the Meridian 1 is shown in "AML cabling between Meridian Mail and Meridian 1" on page 11-25.

Meridian Mail to Meridian 1 network loop cabling

Illustration reference	NT code	Cable	Routing information
Network loop cabling between Meridian Mail and Meridian 1, cable a	QCAD124C (1.8 m or 6 ft.) QCAD124D (3 m or 10 ft.) QCAD124E (4.6 m or 15 ft.) QCAD124F (6.0 m or 20 ft.)	**Direct** network loop cables, non-shielded	From J4/LP0 and J5/LP1 on the backplane of module MM0 to the QPC414 network card on Meridian 1
			If three network loop cables are required (more than 48 ports), the third connects from J4/LP0 or J5/LP1 on module MM1 or MM2, whichever has the second utility card installed, to the second QPC414 network card.
			If four network loop cables are required (more than 72 ports), the fourth connects from J4/LP0 or J5/LP1 on module MM1 or MM2 to the free connector on the module with the second utility card.
Network loop cabling between Meridian Mail and Meridian 1, cable b	NT6P0122	**Indirect** network loop cable, backplane to I/O panel	From J4 and J5 on the backplane of the modules containing the utility cards to the I/O panels (LP0, right, and LP1, left, respectively)

Illustration reference	NT code	Cable	Routing information
Network loop cabling between Meridian Mail and Meridian 1, cable c	NT8D73AD (3 m or 10 ft.) NT8D73AF (3.7 m or 12 ft.) NT8D73AL (6.2 m or 20 ft.) NT8D73AS (9 m or 30 ft.)	**Indirect** network loop cable, I/O panel to I/O panel, shielded	From Meridian Mail right I/O panel LP0 connector and left I/O panel LP1 connector to Meridian 1 module I/O panel, which interfaces with the QPC414
Network loop cabling between Meridian Mail and Meridian 1, cable d	NT8D86AD	**Indirect** network loop cable, I/O panel to network card	Meridian 1 I/O panel to QPC414 network card

Installing the network loop

Introduction

"Installing the network loop hardware" on page 11-7 describes how to install the network loop.

> ⚠ **CAUTION**
> **Risk of equipment damage**
>
> Wear a wrist strap connected either to the metal frame of the equipment or to the wrist strap frame connector while you install this equipment.

Before you continue, make sure you have available all the hardware that is listed below. Refer to "Network loop cabling between Meridian Mail and Meridian 1" on page 11-6 for a diagram of the cabling.

Direct routing from Meridian Mail backplane to QPC414

- QCAD124 (A0296329-32)

Indirect routing from Meridian Mail backplane to QPC414

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

Network loop cabling between Meridian Mail and Meridian 1

Direct routing

QPC414

I/O Panel

I/O to network cable
NT8D86AD

(a)
QCAD124
Network loop
cable (unshielded)
(A0296329-32)

Network

Meridian 1

Alternative,
indirect routing
(See Note 1 below)
Shielded net loop
cable NT8D73
(A0359306/
A0359532/3/4)

Loop 0

Direct
routing

Right I/O
Panel

(b)
NT5K1110 or
NT6P0122

Net loop
to I/O

J4

Meridian Mail
prime node module

·········· optional routing through I/O panel

Notes:
1. To minimize EMI, cables should stay within the module. Therefore, avoid the use of
the alternative indirect routing wherever possible.
2. This diagram depicts the alternative cabling through the right I/O panel to Loop 0, J4.
You can also direct the cabling through the left I/O panel to Loop 1, J5.

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Installing the network loop hardware

To install the network loop hardware, follow these steps.

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

QPC414 network loop card

Enb
Dis
LED
LED
J1
J2

Note: If the system has more than 48 channels, you need to install a second network card.
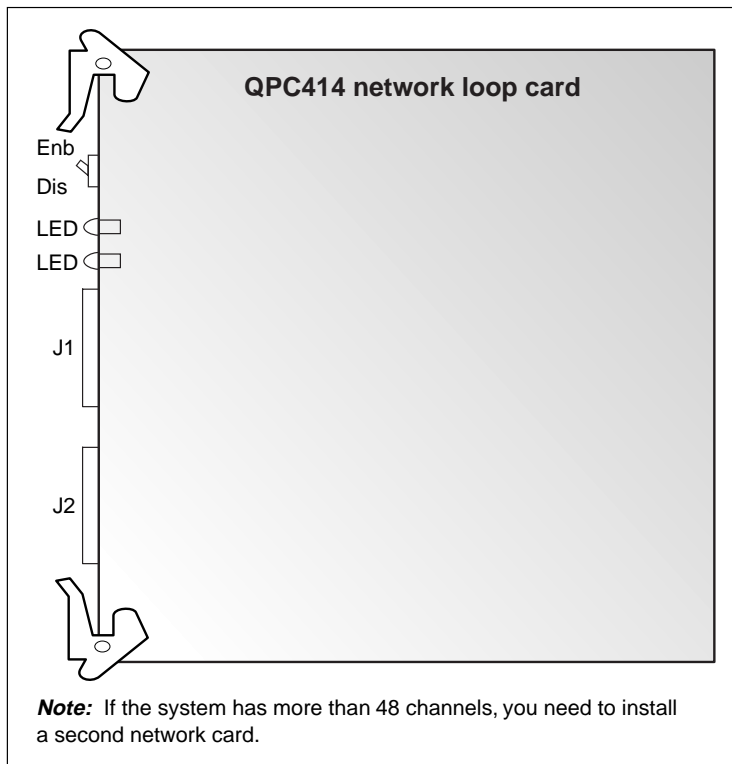
G100186

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

Step	Action
3	With the enable/disable switch set to disable, install the QPC414.
	There are no other switches to set on this card. If you are unfamiliar with how to install circuit cards, refer to *Circuit Card Installation* (NTP 553-3001-211).
	Once installed, both LEDs on the card light.
	Note: There are two options for Network loop cabling—direct or indirect—by way of the I/O panel. Based on your equipment configuration, you may need one or more cables to connect the loop. For cabling routing information, refer to "Network loop cabling between Meridian Mail and Meridian 1" on page 11-6.
4	If you are using direct cabling, follow the steps below. If you are using indirect cabling follow "Using indirect cabling" on page 11-9.

Using direct cabling

To install the Meridian Mail to PBX interface using direct cabling, use "Network loop cabling between Meridian Mail and Meridian 1" on page 11-6 as a reference, and follow these steps.

Step	Action
1	Install the direct loop cable QCAD124 at the Meridian 1 according to step a *or* b below, based on the loop number you select in steps 1 and 2 of this procedure.
	a. If the loop you select is an even number, install the cable in the top slot (J1) of the network card.
	b. If the loop you select is an odd number, install the cable in the bottom slot (J2) of the network card.

Step	Action
2	If you have more than one network loop cable, connect the cables to Meridian Mail as outlined in the following steps:
	a. Connect the first network loop cable to J4 of the first module.
	b. Connect the second network loop cable to J5 of the first module.
	c. If the system has more than 48 channels, you need a third network loop cable and a second utility card. Connect the third loop to J4 of the module that contains the second utility card.
	d. If the system has more than 72 channels, you need a fourth network loop cable. Connect this loop to J5 of the module that contains the second utility card.
	e. Enter the loop numbers in the Meridian Mail configuration. Refer to the chapter on hardware administration in the *System Administration Guide* (NTP 555-7001-30x).
3	Set the switch on the faceplate of the QPC414 network card to "enable."
	The LEDs remain on.

Using indirect cabling   To install the Meridian Mail to PBX interface using indirect cabling, use "Network loop cabling between Meridian Mail and Meridian 1" on page 11-6 as a reference, and follow these steps.

Step	Action
1	Install the I/O panel cable NT8D86AD according to step a *or* b below, based on the loop number you select in steps 1 and 2 of this procedure.
	a. If the loop you select is an even number, install the cable in the top slot, or J1, of the network card.
	b. If the loop you select is an odd number, install the cable in the bottom slot, or J2, of the network card.
2	If they are not already installed, install the network loop cables as shown in "Network loop cabling between Meridian Mail and Meridian 1" on page 11-6 (cable b).
3	Connect the NT8D73 cable between the I/O panels of the Modular Option EC and Meridian 1.

Step	Action
4	If you have more than one network loop cable, connect the cables as outlined in the following steps:
	a. Connect the first network loop cable to J4 of the first module.
	b. Connect the second network loop cable to J5 of the first module.
	c. If the system has more than 48 channels, you need an additional network loop cable and a second utility card. Connect the third loop to J4 of the module that contains the second utility card.
	d. If the system has more than 72 channels, you need a fourth network loop cable. Connect this loop to J5 of the module that contains the second utility card.
	e. Enter the Meridian 1 loop numbers in the Meridian Mail configuration. Refer to the chapter on hardware administration in the *System Administration Guide* (NTP 555-7001-30x).
5	Connect the I/O to I/O cables (NT8D73AD/F/L/S) from the LP0 and LP1 connectors on the Meridian Mail I/O panel to the Meridian 1 I/O panel.
6	Set the switch on the faceplate of the QPC414 network card to "enable."
	The LEDs remain on.

Establishing the AML connection between Meridian Mail and the Meridian 1

Introduction

When Meridian Mail handles a telephone call, it 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. The switch (Meridian 1) passes all this information 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 has insufficient information to process the call correctly.

Hardware requirements

To establish the AML data link, you must install the following hardware:

- MSDL card (NT6D80AA) or ESDI card (QPC513, version H or later), which occupies a slot in a common equipment module of the Meridian 1

- cabling (NTND91AB) from the MSDL or ESDI card to the Meridian Mail backplane

You must also program the link in the Meridian 1 software by modifying the configuration record in LD 17 (described in Chapter 13, "Starting up and configuring Meridian Mail").

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

Software requirements

You must select three values to program the AML: a device number (DNUM), AMLs, and value-added server identifiers

(VSIDs). You select all three values in LD 17 of the Meridian 1 database in response to the three LD 17 prompts below:

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

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

You use the configuration record (CFN) to set all switch operation parameters. All the information you need to determine DNUMs, AML, and VSID numbers is in this record. Therefore, it is important to print off the configuration record before you program the link, to see which numbers are available. If the existing programming permits, try to program all three numbers (DNUM, AML, VSID) as the same number.

Note 1: You must program each I/O device in Overlay 17 at the ADAN prompt. ADAN TTYs are system terminals, ADAN AMLs are application module links, and ADAN DCHs are D-channels. See "I/O card type, DNUM, AML, VSID requirements" on page 11-14.

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

Note 3: Device numbers (DNUMs) are associated with each physical card and cannot be duplicated among device types. AML and VSID numbers are logical numbers and can be duplicated between device types.

Note 4: The Option 81 switch needs two I/O devices (TTYs) to be programmed on the Call Processor cards in its cores. The DNUMs are for both cores. The DNUMs allow access to the cores from the backplane for maintenance purposes. The active

core has access to these ports. Port 0 is for a modem, Port 1 is for a TTY. These ports are in addition to the system terminal.

Note 5: When you print out an Option 81 configuration table in LD 22, these two ports are programmed as ADAN TTYs on card type CPSI and will not indicate a DNUM in their programming. (See "Example of a configuration record showing DNUM, AML, and VSID numbers" on page 11-15.) 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 the same as the assigned TTY number.

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

Note 7: You may want to reorganize (renumber) the devices in the CFN. If you want to omit an AML number without omitting its associated programming (Overlay 23), build another AML (assign it a new number), and associate it with the same VSID as the AML that you want to omit. Then the system allows you to omit the original AML without deleting Overlay 23 programming, which associates the ACD queue with the VSID.

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 0–5	0–15
MSDL	1 DNUM	1 DNUM, 0–15	4	AML 0–15	0–15
MSPS (Opt 21E only)	1 DNUM	1 DNUM, 0–15	1	TTY 0–15	NA
DCHI	2 DNUMs	2 DNUMs—must be consecutive and start with an even number	2	DCH 0–64	NA
CYPSI	2 DNUMs	2 DNUMs, 0–15 (0= modem, 1=TTY)	2	TTY 0–15	NA
* Device numbers used from the 16 I/O device numbers available per switch.					
* * The number of physical devices you can install on this card.					

Example of a configuration record showing DNUM, AML, and VSID numbers

.	**A**) ADAN TTY 3	**(A)** ADAN DCH 4
.	CTYP CPSI	CTYP DCHI
.	PORT 1	GRP 0
(A) ADAN TTY 0	BPS 9600	**(B)** DNUM 5
CTYP SD12	PRTY NONE	DES PRI
GRP 0	STOP 1	USER PRI
(B) DNUM 0	BITL 8	DCHL 2
FLOW NO	FLOW NO	OTBF 32
USER MTC TRF	USER MTC TRF	DRAT 64KC
SCH	SCH BUG	CLOK EXT
XSM NO	XSM NO	IFC SL1
(A) ADAN TTY 1	**(A, C, F)**ADAN AML 6	SIDE NET
CTYP SD12	CTYP ESDI	RLS ID 18
GRP 0	GRP 0	T23 20
(B) DNUM 1	**(B)** DNUM 6	T200 3
FLOW NO	DES MODMAIL	T203 10
USER MTC TRF	BPS 4800	N200 3
SCH	CLOK EXT	N201 260
XSM NO	IADR 003	K7
(A) ADAN TTY 2	RADR 001	**(G)** VSID 06
CTYP CPSI	T1 04	DLOP
PORT 0	T2 010	AML 06
BPS 9600	T3 010	SECU NO
PRTY NONE	N1 128	INTL 0001
STOP 1	N2 08	MCNT 9999
BITL 8	K 7	CONF DIR
FLOW NO	RXMT 05	
USER MTC TRF	CRC 10	
SCH BUG	ORUR 005	
XSM NO	ABOR 005	
(go to next column)	(go to next column)	
	–See Notes on the next page–	

Notes:

(A) There are six I/O devices programmed in this configuration record.

(B) There are four device numbers (DNUMS) taken (0 & 1, 2 & 3, 4 & 5, 6 & 7).

(C) The Meridian Mail data link is programmed as an ADAN AML. Its AML is 6 and its DNUM is 6.

(D) From this configuration, the DNUMS available to assign to a new I/O card are 8 & 9, 10 &11, 12 & 13, and 14 &15.

(E) DNUM 5 is *not* available because each DCHI card (as well as the ESDI card) captures a pair of ports whether assigned in the software or not.

F) Notice the ADAN AML programming. The card type (CTYP) is ESDI (it could be MSDL if this system uses this type of I/O card). The DNUM is 6. All other prompts that follow ADAN AML 6 represent the parameters set for the Meridian Mail data link.

(G) Notice the VSID prompt that follows the ADAN AML 6 programming. Each Meridian Mail data link (AML) requires that a VSID be assigned to it. The VSID programming here associates ADAN AML 6 and DNUM 6 with VSID 6. Remember that each DNUM is unique. However, AMLS and VSIDs are logical numbers and, therefore, can be the same. For example, you can have both an AML 6, a TTY 6, and a DCH 6, but they must all have different DNUMS assigned.

(H) If possible, make all three numbers for each data link the same, if the existing programming allows it.

Installing the multipurpose serial data link card

Introduction

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

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

Installing the MSDL card

To install the MSDL card, follow these steps.

Step	Action
1	Log on to the Meridian 1.
2	Load overlay 22 and print out the configuration record.
3	Enter the responses indicated in the following table. *Note:* Only the prompts that you need to respond to are shown. If you see a prompt not in the table, press Enter until the next prompt in the table appears.

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	Configuration data block

Step	Action
4	Refer to the configuration record and 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, select any unused TTY in the range 0–15. Preferably, select the same number for all three numbers. Record these numbers. You need them when you configure the link.
5	Unpack and inspect the MSDL card and check that there are no obviously loose or bent parts.

Step   Action

6   Set the switches on the MSDL card for the port you are going to
         use for the AML according to the settings shown in the following
         table.

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

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

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

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

10   Observe the red LED on the MSDL faceplate.

         The LED should flash three times, and then stay on until the
         card is configured and enabled in the software. If the LED does
         not behave in this pattern, replace the card.

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

MSDL switch locations and example of switch settings

Card address select switches (TTY port/DNUM)

Tens   Ones

S9   S10

LED

Port 0   DCE   DTE   Setting for an RS-232 interface.
                ON   ON   DTE/DCE are software configured.
                S4   S8

Port 1   DCE   DTE   Setting for an RS-422 DTE
                ON   ON   interface.
                S3   S7

Port 2   DCE   DTE   Setting for an RS-422 DCE
                ON   ON   interface.
                S2   S6

Port 3   DCE   DTE   Setting for an RS-232 interface.
                ON   ON   DTE/DCE are software-configured.
                S1   S5

Monitor
port

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

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Installing the enhanced serial data interface card

Introduction

Each enhanced serial data interface (ESDI) card has two ports on the faceplate, J1 and J2, to which you can connect the AML cable. You assign each port a device number (DNUM), which you use to establish the software link with Meridian Mail. (This is explained in Chapter 12, "Configuring the Meridian 1.")

There are two important criteria to consider when you determine and program the DNUMs for the ESDI card:

• The two numbers must be consecutive.

• The lower number must be even.

You select DNUMs on the ESDI card by setting SW2. The maximum possible number of devices on the Meridian 1 is 16. See the following table.

Note: You must assign the even number of the pair to the J1 port of the ESDI card. You then assign the odd number to the J2 port.

Switch settings for device address (DNUM) on ESDI card (QPC513H or later)

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

You need a vintage H ESDI card. Be sure to use the correct switch option settings required for this card.

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

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

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

Installing the ESDI card

To install the ESDI card, follow these steps.

Step	Action
1	Log on to the Meridian 1.
2	Load Overlay 22 and print out the configuration record. Refer to the following table for instructions.

Prompts	Responses	Description
REQ	PRT	
TYPE	CFN	Configuration data block

Step	Action
3	Refer to the configuration record and select an available device number (DNUM), Application Module Link (AML number), and Value Added Server Identifier (VSID).
	The DNUMs are the same numbers as the TTYs.
	To choose an available DNUM, choose any unused TTY in the range 0–15. Preferably, select the same number for all three numbers. Record these numbers. You will need them when you configure the link and the ESDI.
4	Unpack and inspect the ESDI card, and check that there are no obviously loose or bent parts.
5	Set the ESDI faceplate switch to "DIS."
6	Set the option jumpers for the port you are going to use on the ESDI card according to the illustration in step 7.

Step	Action

7   Remove the banks of jumpers and position the ESDI card as shown in the following illustration.

Note: This figure shows both high and low ports configured for Meridian Mail. The higher port example shows the required setting when Meridian Mail is within 15.24 m (50 ft.) of the Meridian1 switch. The lower port example shows the required setting when Meridian Mail is far enough away from the switch that you need to use local data sets or a line driver. You need to configure only the port that is used.

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Step	Action
8	Set the device address switches on the ESDI card according to the following illustration. This is the DNUM that you will use in Overlay 17.

QPC513H or later

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

1 = switch on, 0 = switch off

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9	Select a slot in the common equipment module of the Meridian 1 and install the ESDI circuit pack.
	Refer to *Circuit Card Installation* (NTP 553-3001-211).
10	Set the ESDI faceplate switch to ENB.

Installing the AML cabling

Installing the AML cable (indirect routing)

See "AML cabling between Meridian Mail and Meridian 1" on page 11-25.

To install the AML cable for indirect routing, follow these steps.

Step	Action
1	Connect the AML cable as described in either step a (for an MSDL card) or step b (for an ESDI card). a. MSDL card: Connect one end of the MSDL cable **e** (NTND27AA or NTND27AB) to the assigned MSDL port (ports 0, 1, 2, or 3). Connect the other end to the I/O panel of the Meridian 1. b. ESDI card: Connect one end of the ESDI cable **d** (P0695822) to J1 (for the lower, even DNUM), or to J2 (for the higher, odd DNUM) of the QPC513. Connect the other end to the I/O panel of the Meridian 1.
2	Connect one end of the AML cable **c** (NTND91AA/AB) to the I/O panel of Meridian 1. Connect the other end to the CSL port on the right I/O panel of Meridian Mail.
3	Verify that the cable connections are secure on cable **b** from J3 on the backplane of module MM0 to the right I/O panel, CSL port.

Installing the AML cable (direct routing)

To install the AML cable for direct routing, follow these steps.

Step	Action
1	If there is a cable from J3 on the backplane of module MM0 to the right I/O panel, CSL port, remove it. See "AML cabling between Meridian Mail and Meridian 1" on page 11-25, cable **a**.

Step	Action
2	Connect the MSDL or ESDI cables from the card to Meridian Mail as described below.

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

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

AML cabling between Meridian Mail and Meridian 1

Note: To minimize EMI, cables should stay within the module. Therefore, avoid the use of alternative, indirect routing through the I/O panel wherever possible.
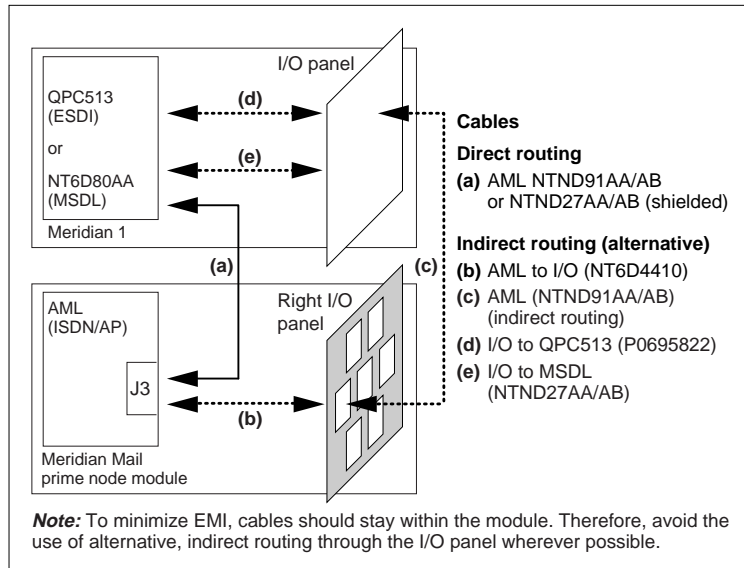
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Chapter 12

Configuring the Meridian 1

In this chapter

Overview

Introduction   This section describes the Meridian 1 configuration procedures necessary for Meridian Mail service.

Meridian 1 configuration procedures

You should perform the following procedures in the order in which they are presented:

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

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

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

    – Establishing the AML using an ESDI card
    – Establishing the AML using an MSDL card

    The section entitled "Establishing the AML using an ESDI card" provides generic and release-specific instructions for the ESDI card. You should follow the procedures that apply to the software release you are using.

3. defining the customer data block

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

5. programming and verifying the network loop

6. adding ACD agents

7. setting call routing options for user telephone sets

8. saving changes to the Meridian 1 configuration

Getting started

Introduction

Before you begin, ensure that the appropriate software and hardware conditions are met on the Meridian 1 before you install Meridian Mail. See the *Site and Installation Planning Guide* (NTP 555-7061-200) for details.

Required documentation

To perform the following procedures successfully, you should have the following documentation available:

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

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

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

Prompt tables

In the tables that show 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 you exit the overlay. If you do not do so, the information you entered is discarded when you exit the overlay.

To exit an overlay, enter ******** or **END**, followed by <Return>.

Checking the CPU ROM daughterboard

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

Note: The ROM check and replace procedure does not apply to Systems 51C, 61C, 81, and 81C.

ROM selection   The required ROM is one of the following:

- SL-1 ST (Release 12-14)   QPC717
- SL-1 ST (Release 15 or later)   QPC940
- SL-1 N   QPC782
- SL-1 LE   QPC573
- SL-1 XL   QPC599
- SL-1 XNQPC600
- SL-1 XN (Memory Enhanced)   QPC601
- SL-1 RT/NT/XT   QPC602
- SL-1 MSQPC662
- System 21/21A   QPC940
- System 51/61/71   QPC939

If you must replace the ROM, follow the procedure described in the next section for either 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.

Replacing the CPU ROM daughterboard

Single-CPU Meridian 1   To replace the CPU ROM daughterboard on a single-CPU Meridian 1, follow these steps. (Service will be interrupted during this procedure since you need to power down the Meridian 1.)

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

Dual-CPU Meridian 1   To replace the CPU ROM daughterboard on a dual-CPU Meridian 1, follow these steps. (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.)

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

Step	Action
8	Use the **SCPU** command (Overlay 35) to switch CPUs.
9	Repeat steps 1 to 7 for the second CPU.
10	Exit from Overlay 35 by entering ****.

Establishing the AML using an ESDI card

Introduction   You can use an ESDI card to establish the AML between
Meridian Mail and the Meridian 1 regardless of X11's software
release. However, the commands used to program the link may
vary based on the software release. For more, information refer
to the following sections:

- Defining the ESDI and the AML (see below)
- "Enabling ESDI ports (ESDI, X11 Release 17 or earlier)"
  on page 12-13
- "Activating the AML (ESDI, X11 Release 18 or later)" on
  page 12-14

To establish the AML between the Meridian 1 and Meridian
Mail, using an MSDL card, follow the steps outlined in
"Establishing the AML using an MSDL card" on page 12-15.

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

Configuring the ESDI   To configure the ESDI and the AML, follow these steps.
and the AML

Step	Action
1	Enter **LD 17** to load Overlay program 17.
2	Enter the appropriate response to the prompt. Refer to "Overlay 17—ESDI and AML configuration (X11 Release 17 or earlier)" on page 12-8, for link configuration for X11 software Release 17 or earlier; refer to "Overlay 17—MSDL and AML configuration" on page 12-15 for link configuration for X11 software Release 18 or later.
3	Enter ******** to exit from Overlay program 17.

Note: The shaded areas in "Overlay 17—ESDI and AML
configuration (X11 Release 17 or earlier)" on page 12-8 apply
to Network Message Service systems (NMS) systems only.

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

Prompts	Responses	Description
LCTL	YES	Modify link control parameters.
REQ	CHG	
TYPE	CFN	Configuration data block
Note: The prompts in the shaded area below are applicable to NMS only.		
ISDN	YES	NMS only—To update the AML records
IFC	SL1	NMS only—Interface type is SL-1 (the Meridian 1)
RLS	16	NMS only—Minimum Meridian 1 software release at the far end is 16
IOTB	YES	Make changes to logical units
ADAN	NEW TTY xx	To add an AML, where xx is an unused TTY number (0–15)
	CHG TTY xx	*Note:* Ensure that this number does not conflict with another device number (for example, FDK if using Release 15).
	OUT TTY xx	To change an AML, where xx is the link number (0–15)
		To remove an AML, 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
IADR	3	Data link level HDLC protocol individual address (identifies the Meridian 1 at HDLC data link level)

Prompts	Responses	Description
RADR	1	Data link level HDLC protocol remote address (identifies Meridian Mail at HDLC data link level)
T1	10	Retransmission timer (range 2–20 is in units of 0.5 s.; for example, 3 = 1.5 s.)
T2	0	Timer for no frame exchange (range 0–255, in seconds)
T3	40	Timer for initial link setup (range 2–255 is in units of 0.5 s.)
N1	128	Maximum number of octets (8-bit bytes) per HDLC information frame. Allowed values are 32, 64, (128).
N2	8	Maximum number of retransmissions. Allowed values are 4–(8)–16.
K	7	Maximum number of outstanding frames. Allowed values are 1–(2)–7.
LTHR	YES	Modify link performance thresholds. Use defaults for all prompts except USER.
USER	CMS	This ESDI port is used for AML.
ADAN	<cr>	Go on to next prompt.
VAS	NEW or CHG	Define AML configuration.
VSID	xx (range is 0–15)	Server ID. Should be the same number as the associated AML number entered for ADAN above.

Prompts	Responses	Description
DLOP	<cr>	Go on to next prompt.
CMS	xx (range is 0–15)	Must be the same number as the ESDI device address (DNWM).
CONF	DIR	Link configuration is DIR.
CMS	<cr>	Go on to next prompt.
BPS	9600	AML data rate
CLOK	EXT	External clocking arrangement
CSQI	20 *	Maximum number of call registers for input queues (twice the number of voice ports)
CSQO	20 *	Maximum number of call registers for output queues (twice the number of voice ports)
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

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

Important: Refer to Appendix D, "CSQI, CSQO, and call register settings," for specific details.

Overlay 17—ESDI and AML configuration (X11 Release 18 or later)

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

Prompts	Responses	Description
RADR	(1)	Remote address for the datalink level HDLC protocol. The IADR and RADR prompts must be coordinated 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 s.
T2	10	Maximum time allowed without a frame being exchanged
T3	40	Timer for initial link setup 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 in steps of 1
K	(7)	Maximum number of outstanding frames
LTHR	NO	Default link performance thresholds (ESDI only)
ADAN	<CR>	Press return to access the VAS prompt.
VAS	NEW	Add, change, or remove a value added server.
VSID	0-15	VAS identifier. To make it easy to remember this number, use the same number as the AML number.
DLOP	<CR>	
AML	0–15	AML number
CONF	DIR	Direct CSL configuration
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Enabling the ESDI port or activating the AML

Introduction   The link diagnostic program, Overlay 48 (refer to NTP 553-3001-400, Release 18) is used to enable the ESDI port (if running X11 software Release 17 or earlier), or to activate the AML (if running X11 software Release 18 or later). If you are using an ESDI card and running X11 software Release 17 or earlier, follow "Enabling ESDI ports (ESDI, X11 Release 17 or earlier)" below, to enable the ESDI port. Otherwise, follow "Activating the AML (ESDI, X11 Release 18 or later)" on page 12-14 if you are using an ESDI card and running X11 software Release 18 or later.

If you are using an MSDL card and running X11 software, Release 18 or later, follow "Activating the AML (MSDL card, X11 Release 18 or later)" on page 12-18.

Enabling ESDI ports (ESDI, X11 Release 17 or earlier)   To enable ESDI ports (ESDI, X11 Release 17 or earlier), follow these steps.

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

Activating the AML (ESDI, X11 Release 18 or later)

To activate the AML (ESDI, X11 Release 18 or later), follow these steps.

Step	Action
1	Enter **LD 48** to load Overlay 48.
	Note: The bold and italicized n (*n*) in the commands below represents a variable. Substitute the AML number instead.
2	Enter **ENL AML *n* ACMS** to initiate the Auto Setup sequence and establish the link.
3	Enter ******** to exit from Overlay program 48.

Status messages

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

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

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

- 25-05 CSL P Link is up

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

Establishing the AML using an MSDL card

Introduction

You can use an MSDL card to establish the AML between Meridian Mail and the Meridian 1 if X11's software release is 18 or greater. To establish the AML between the Meridian 1 and Meridian Mail, follow the steps outlined in these sections:

- Defining the MSDL and AML (below)
- "Activating the AML (MSDL card, X11 Release 18 or later)" on page 12-18

To establish the AML between the Meridian 1 and Meridian Mail using an ESDI card, follow the steps outlined in "Establishing the AML using an ESDI card" on page 12-7.

Defining the MSDL and AML

Use Overlay 17 to define the MSDL and AML on the Meridian 1. Refer to the following table for link configuration.

Overlay 17—MSDL and AML configuration

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

Prompts	Responses	Description
DES	aaa...a	AML port designation. This can be any alphanumeric string up to 16 characters: 0–9 and A–Z (uppercase only) are allowed. Characters * and # are not allowed.
BPS	9600	Baud rate
PARM	(R232 DCE)	(MSDL only) Interface and transmission mode
CLOK7	EXT	Internal or external clock. Source of primary clock is either internal or external. (ESDI only)
IADR	(3)	Individual Address for the datalink HDLC protocol. You must coordinate the IADR and RADR prompts 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 datalink level HDLC protocol. The IADR and RADR prompts must be coordinated 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 s.
T2	10	Maximum time allowed without a frame being exchanged
T3	40	Timer for initial link setup 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 in steps of 1
K	(7)	Maximum number of outstanding frames
LTHR	NO	Default link performance thresholds (ESDI only)

Prompts	Responses	Description
ADAN	<CR>	Press return to access the VAS prompt.
VAS	NEW	Add, change, or remove a value added server.
VSID	0–15	VAS identifier. To make it easy to remember this number, use the same number as the AML number.
DLOP	<CR>	
AML	0–15	AML number
CONF	DIR	Direct CSL configuration
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

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

Introduction   Use the link diagnostic program, Overlay 48 (NTP 553-3001-400, Release 18), to enable the AML port on the MSDL card. If you are using an ESDI card and running X11 software Release 18 or later, follow "Activating the AML (ESDI, X11 Release 18 or later)" on page 12-14 to activate the AML.

Activating the AML   To activate the AML (MSDL card, X11 Release 18 or later), follow these steps.

Step	Action
1	Enter **LD 48** to load Overlay 48. ***Note:*** The bold and italicized n (***n***) in the commands below represents a variable. Substitute the appropriate information.
2	Enter **ENL MSDL *n*** (where *n* is the DNUM) to enable the card.
3	Enter **SLFT AML *n*** to test the MDSL pack for port *n*.
4	Enter **DIS AML *n* LYR2** to disable AML port *n*.
5	Enter **ENL AML *n* AUTO** (where *n* is the AML number) to initiate the Auto Setup sequence and establish the link.
6	Enter ******** to exit from Overlay program 48.

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

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

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

- 25-05 CSL P Link is up

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

Defining Meridian Mail in the customer data block

Introduction

You must define the Meridian Mail service in the customer data block using Overlay 15. Have the filled-in data forms from the *Site and Installation Planning Guide* (NTP 555-7061-200) available for reference.

Overlay 15 prompts

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

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

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

Normally, you route non-direct inward dialing (DID) calls to Meridian Mail when a no-answer or busy condition is encountered. As an option, you can route DID calls to the attendant's or user's hunt DN.

Defining Meridian Mail in the customer data block

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

Step	Action
1	Load Overlay 15 at the Meridian 1 administration terminal.
2	Respond to the prompts as shown in "Overlay 15—Customer data block" on page 12-20.
3	When configuration is complete, enter ******** or type **END** followed by <Return> in response to the prompt REQ.

Overlay 15—Customer data block

Prompts	Responses	Description
REQ	NEW or CHG	
TYPE	CDB	Customer data block, 0 for single customer, 1 for multicustomer
CUST		Enter the customer number (range 0–99).
ATDN	_____	Attendant DN. Typically, this is 0 (zero).
OPT	MCI	A message center is included for the customer.
IMS	YES	Integrated Voice Messaging feature
IMA	YES	Enable Integrated Voice Messaging attendant for the customer.
FNAD	FDN	Call forward no answer DID calls are routed to the flexible CFNA DN.
FNAN (or FNAT)	FDN	Call forward no answer non-DID calls are routed to the flexible CFNA DN.
FNAL	FDN	Call forward no answer local calls (with CFCT enabled) are routed to the flexible CFNA DN.
CFTA	NO	The CFNA prompt appears only if you respond YES to this prompt.
CFN*n*	_____	CFN0 CFN1 CFN2 Number of ring cycles before the call is forwarded
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.

Prompts	Responses	Description
MWFB	YES (NO)	NO (recommended)—No-answer DID calls are routed to wherever the user wants (including Meridian Mail).
		YES—No-answer DID calls are routed to Meridian Mail.
MATT	YES (NO)	Set to NO because the attendant is not the message center.
		Set to YES, unless NMS (Network Message Service) has been purchased.
		Note: For MDID, NDID, and MWFB, see the *Quick Reference Guide*.
EEST	NO	Originating party does not receive DTMF feedback. Remote Meridian 1 sites should also be set to NO.
Note: The prompts in the shaded area below are applicable to NMS only.		
ISDN	NO	(NMS only—To change ISDN options)
PNI		NMS only—Private Network Identifier. Within one network, use the same PNI value in Overlays 15 and 16. When interworking with different networks, enter the PNI of this Meridian 1 in Overlay 15, and the remote switch PNI in Overlay 16.
HLOC		NMS only—Home Location Code (ESN) of the Meridian 1 (range 100–999)
LSC		NMS only—Local Steering Code (established in the Coordinated Dialing Plan, or CDP) of the Meridian 1. This prompt only appears for 5- or 6-digit dialing plans.
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.
The flexible call forward DN is the Meridian Mail DN. It is entered in the telephone set data block for each Meridian Mail user.		
The other options for FNAD, FNAL, and FNAN are att- route to attendant hnt- route to the hunt DN no- do not route unanswered calls		

Overlay 15—Customer data block, Release 21 and later

As of Release 21, you can directly access a given data block by entering the first three letters of a gate opener. Below are the required tables for configuring the customer data block.

Attendant Console Options

Prompts	Responses	Description
REQ	CHG	Change existing data
TYPE	ATT	Attendant Consoles
CUST	0	Customer number
OPT	MCI	Message Center Included
ATDN	(0) x...x	Attendant Directory Number

Integrated Message Service Options

Prompts	Responses	Description
REQ	CHG	Change existing data
TYPE	IMS	Integrated Message Service
CUST	0	Customer number
IMS	YES	Change Integrated Message System
IMA	YES	Integrated Message System enabled

Call Redirection Options

Prompts	Responses	Description
REQ	CHG	Change existing data
TYPE	RDR	Call Redirection
CUST	0	Customer number
FNAD	FDN	Call Forward No Answer Treatment for DID calls
FNAT	FDN	Call Forward No Answer Treatment for External Trunk non-DID calls
FNAL	FDN	Call Forward No Answer Treatment for all other calls including trunk calls marked as internal
CFTA	NO	Call Forward to Trunk Access code allowed

Features and Options

Prompts	Responses	Description
REQ	CHG	Change existing data
TYPE	FTR	Features and options
CUST	0	Customer number
EEST	NO	Originating party does not receive DTMF feedback. Remote M1 sites also = NO.

Configuring the trunk route data block (NMS only)

Introduction

This procedure shows how to configure the trunk route data block for the Network Message Service feature.

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

Configuring the route data block

To configure the route data block, follow these steps.

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

Overlay 16—Route data block parameters

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 provides the CLID display information.
TRO	YES	Optimize trunk usage on this route.
INAC	YES	Insert ESN access code to incoming private network call.
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Defining Meridian Mail primary ACD queues

Introduction

You must configure a separate primary queue for each port type: Basic voice, Full Service voice, and Multimedia. This procedure shows how to configure the ACD groups for each queue. See "Configuring Voice Services" in the *System Administration Guide* (NTP 555-7001-301) for detailed instructions on how to configure the Voice Services queues.

Defining the primary Meridian Mail ACD queues

To define the primary Meridian Mail ACD queues, follow these steps.

Step	Action
1	Load Overlay 23 at the Meridian 1 administration terminal.
2	Respond to the prompts as shown in "Overlay 23—Voice Messaging ACD parameters" on page 12-26, to add a primary queue.
3	Press <Return> for each prompt that appears after NCFW.
4	When the REQ prompt appears, enter **NEW** to add another voice service primary queue.
5	Repeat steps 2 to 4 for each primary queue that you want to configure.
6	When you have configured the primary ACD queues, enter **END** followed by Return at the next REQ prompt, to exit the overlay.

Overlay 23—Voice Messaging ACD parameters

Prompts	Responses	Description
REQ	NEW	
TYPE	ACD	ACD data block
CUST		Meridian 1 customer number
ACDN		Enter the main DN for the voice service. This number should be the same as the DN specified for the service in the VSDN table.
MWC	YES	This is a Message Center DN.
IMS	YES	This is an Integrated Messaging Service.
CMS	YES	Use the AML Applications Protocol.
IMA	YES	Enable IMS attendant.
IVMS	YES	Integrated Voice Messaging
VSID		Enter the VAS ID (0–15). Refer to Overlay 17 or 22.
MAXP		Maximum number of ACD agents for the appropriate primary queue. This should be equal to or greater than the number of voice channels allocated to the service.
ALOG	YES	Provide automatic logon for the ACD agents associated with this group.
NCFW		Night Call Forward. This is the destination number for calls rerouted when Meridian Mail is down.
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Defining Meridian Mail secondary ACD queues

Introduction

This procedure describes 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: You must complete this overlay once for each agent. The number of agents is the number of channels per port.

Defining Voice Services ACD queues

To define Voice Services ACD queues, follow these steps.

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

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 multitenant sites using multicustomer option; you require Release 16. For Voice Services, set to NO.
MAXP	1	Maximum number of positions
NCFW	xxxx	Enter the main DN for the primary queue for the selected service. (If this is an NMS satellite site, use network format.)
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Meridian Mail numbering requirements are slightly different when the Guest Voice Messaging option is installed. Refer to the *System Administration Guide* (NTP 555-7001-301) for details.

Programming the network loop

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

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

Step	Action
1	Load Overlay 22 and print out the configuration record. Refer to "Overlay 17—Configuring the network loop" on page 12-29. Read the configuration record to select a loop that is not already reserved.
	Note: Meridian Mail EC supports only double-density loops.
	The maximum number of channels per loop is 24. The Utility card supports a maximum of 48 channels. Meridian Mail can have up to 96 channels.
2	Load Overlay 17 and configure the network loop as outlined in the *X11 Input/Output Guide* (NTP 553-3001-400). Refer to the section "Common Equipment, CEQU."
3	Program the Meridian Mail loop by responding to the prompts shown in "Overlay 17—Configuring the network loop" on page 12-29.
4	Print out the configuration record to verify your programming.
	Your configuration record will be similar to the example in "Example of a configuration record printout" on page 12-29. In this case, Loop 34 could support Meridian Mail.

Overlay 17—Configuring the network loop

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

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

To verify the network loop, follow these steps.

Note: C-processors do not require initialization. Use the ENLL xx and STAT xx commands in Overlay 32 to enable and verify the specific network loop.

.

Step	Action
1	Initialize the switch manually by pressing the MAN INT button on the CPU card. If you have a dual CPU, press the main MAN INT button on the active CPU.
	This should automatically enable the loop, and the corresponding LED should extinguish. This indicates that the loop is enabled.
2	Load Program 30 to verify the status (STAT), and test (LOOP) the network loop of *x* (where *x* represents the particular loop being tested). Follow the acceptance testing procedure listed in the *Circuit Card Installation* (NTP 553-3001-211).
3	If you receive an error message, refer to the *X11 Input/Output Guide* (NTP 553-3001-400) to troubleshoot and correct the problem.
	If you receive an OK, the loop connection is successfully established.

Adding ACD agents

Introduction

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

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

Note 1: It is useful to have the AML disabled when you add agents. If you leave it enabled, the service changes take much longer to perform.

To disable the link, use the Overlay 48 command:

- DIS ESDI *n* (X11 Release 17 or earlier) or
- DIS AML *m* LYR2 (X11 Release 18 or later)

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

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

Note 3: Whenever ACD agent data is modified on the Meridian 1, you must make corresponding changes on Meridian Mail. To change DNs refer to "Channel Allocation Table" section in the "System status and maintenance" chapter of the *System Administration Guide* (NTP 555-7001-301). To modify TNs, refer to "Node configuration" in the "Modify hardware" chapter of *System Administration Tools* (NTP 555-7001-305).

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

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

Adding ACD agents   To add ACD agents, follow these steps.

Step	Action
1	To begin adding ACD agents, load Overlay 11.
2	Respond to the prompts, as shown in "Overlay 11—ACD agents" on page 12-33, for the first agent.
3	Repeat step 2 for each ACD agent.
4	When when you have added all the agents, reply ******** to the prompt REQ.

Overlay 11—ACD agents

Prompts	Responses	Description
REQ	NEW	
TYPE	SL1	
TN	ll s cc u	Enter an ACD agent TN. Ranges: Double Density Loop = 0–159 Shelf = 0–1 Card = 2–3 Unit = 0–7 (for DD)
CDEN	DD	ACD agents must be on double density-line card.
DES	yyyyyy	ACD agent description of 1–6 characters
CUST		Enter the customer number.
KLS	1	Key loop segment
CLS	VMA	Enter class of service: voice messaging allowed. Use the default for all other Class of Service options.
KEY	0 ACD xxxxxxx 0 yyyyyyy	Define key 0 as an ACD agent key. DN xxxxxxx is the Meridian Mail DN. ID yyyyyyy is any unused DN in the numbering plan, and is used to identify the agent position. It is not dialed by users.
KEY	1 SCN zzzzzzz	Define key 1 as a single-call non-ringing DN (SCN-DN). Also use this value when you configure the Channel DN in the Channel Allocation table. See "System status and maintenance" in the *System Administration Guide* (NTP 555-7001-301).
KEY	2 MSB	Define key 2 as a Make Set Busy key.
KEY	3 NRD	Define key 3 as a Not Ready key.
KEY	6 TRN	Define key 6 as a Transfer key.
KEY	7 AO3 (letter O)	Define key 7 as a Conference key.
KEY	9 RLS	Define key 9 as a Release key.
	CR	Press carriage return to the end of the overlay. (The prompt REQ comes up.)
		If you are finished adding agents, continue with the next step and exit. To add another agent, return to the top of the table.
	****	Exits the overlay.

Example

- Agent 1   Key 0 ACD 3650 3800

                             Key 1 SCN 2800
- Agent 2   Key 0 ACD 3650 3801

                             Key 1 SCN 2801

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

Setting call routing options for user telephone sets

Introduction

Set call routing options for each user's set as shown in "Overlay 10—2500 set data" on page 12-36 for 2500 sets, and "Overlay 11—Meridian 1 set data" on page 12-37 for Meridian 1 sets.

Call routing options and features

The following call routing options and features are available:

- *Routing of Calls to Meridian Mail* The method of routing calls to Meridian Mail is defined in the customer data block, Overlay 15.
- *Call Forward No Answer* If the Flexible Call Forward feature is used, enter the Meridian Mail DN in response to the prompts FTR "Overlay 10—2500 set data" on page 12-36, and FDN "Overlay 11—Meridian 1 set data" on page 12-37. 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 routes to Meridian Mail.
- *Call Forward Busy* A call to a busy number routes to the Meridian Mail Service unless one of the following conditions exists:
  - The call is direct inward dial (DID), and Call Forward Busy on DID calls is disabled for the customer (see Overlay 11).
  - The Call Waiting feature is enabled for the user in two forms: Call Waiting (applies to incoming trunk calls) and Station-to-Station Call Waiting (applies to internal calls).
- *Routing to Hunt DNs* If the user has a hunt DN defined, then the call is routed to the Hunt DN. If there is a no answer/busy condition at the Hunt DN, the call is routed to the Meridian Mail mailbox for the originally called DN.
- *Message Waiting Indication* A user is notified of a new message by a lit message-waiting lamp, or an audible indication (interrupted dial tone).

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

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.
	DTN	Digitone class of service
FTR	FDN HTA	Hunting is allowed.
FTR	FDN xxxx	xxxx is the flexible call forward no answer DN (Meridian Mail DN).
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Overlay 11—Meridian 1 set data

Prompts	Responses	Description
REQ	NEW, CHG	
TYPE		Type of set (for example, SL1, 2317, 3000)
TN	lll s cc uu	Terminal number: loop, shelf, card, unit
CDEN	sd, (dd), 4d	Card density: single, double, or quadruple
CUST		Customer number
FDN		Flexible call forward no answer DN (Meridian Mail DN).
CLS	HTA	Hunting is allowed.
	MWA	Message waiting is allowed.
	FNA	Call forward no answer is allowed.
	FBA (FBD)	Call forward busy is allowed (denied).
HUNT		Hunt (internal) DN
KEY	0 SCR xxxx	Single call ringing DN, where xxxx is the user's DN
KEY	1–9 MWK yyyy	Add a message waiting key/lamp, where yyyy is the Meridian Mail DN. For phonesets with softkeys, you may have to use a higher key number. If the key number you choose is rejected, consult the SCH code description.
KEY	1–9 AO3	Add a 3-party conference key. This is necessary for some basic Meridian Mail features.
KEY	1–9 CFW yy xxxx	Call forward all calls (where yy is the maximum DN length and xxxx is the call forward DN).
	CR	Press <Return> to the end of the overlay. (The prompt REQ comes up.)
	****	Exits the overlay.

Saving Meridian 1 changes

Introduction

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

Saving changes to Meridian 1 configuration

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

Step	Action
1	Load Overlay 43.
2	At the next "." prompt, enter **EDD** to start dumping the data to disk. 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, use a new disk. *Note:* Do *not* remove the disk while the LED is lit. As long as the LED is on, the disk is still being written to.
4	Enter ******** to exit from Overlay 43. (The **END** command does not work in this case.)
5	Enter **LOGO** to logout.

Chapter 13

Starting up and configuring Meridian Mail

In this chapter

Overview

Introduction   This chapter describes how to verify that the system boots
                         properly to the Meridian Mail startup screen.

                         Note: The Meridian Mail 13 system *does not* come pre-loaded
                         with software.

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

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

> **CAUTION**
> **Risk of equipment damage**
>
> You can blow the fuses on the Utility card
> if you do not follow the sequence of steps
> outlined in this manual to power up or
> power down your Meridian Mail system.

Starting up Meridian Mail

Introduction   To start Meridian Mail, follow these steps.

Note: If any problems occur during start-up, see Chapter 16, "Troubleshooting startup problems."

Starting up Meridian Mail

Step	Action
1	Power on the administration terminal, printer, and other peripheral devices.
2	On the administration terminal, press Ctrl and Print Screen at the same time to turn on automatic printing. Note that the Print Screen key may be labeled differently on your keyboard.
	The word "Aut" appears at the bottom of the terminal screen to indicate that automatic printing is turned on. The automatic printing allows you to capture a printout of the bootup messages when you power on the Meridian Mail system. The bootup messages that should appear are outlined in Chapter 16, "Troubleshooting startup problems." 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 Chapter 16.
3	Before you power up the Meridian Mail system, look at "Start-up Meridian Mail—behavior of LED indicators" on page 13-4, and be prepared to verify the proper behavior of the LEDs that are visible at the front of each module. Be prepared to observe the hexadecimal display on the front of the Enhanced MMP40 board (see "Hexadecimal display on the Enhanced MMP40 board" on page 13-5).
4	Power up the Meridian Mail system by setting the main breaker switch for each column to ON, and shelf breakers or DCEPS switches to ON.
	If this system has more than one Meridian Mail module, power on module MM0, followed by module MM1, then module MM2.
	In an AC system, switch on the upper breaker in each module before the lower breaker. In a DC system, switch on the left DCEPS in each module before the right one.
	As part of the bootup process, the administrator's terminal displays a series of diagnostic and information messages.

Step	Action
5	Check for power problems.

LEDs on the power units at the base of the column indicate that power is on. You should hear the fans in the base of the column. If these LEDs do not behave as described, consult Chapter 16, "Troubleshooting startup problems."

Start-up Meridian Mail—behavior of LED indicators

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

Hexadecimal display on the Enhanced MMP40 board
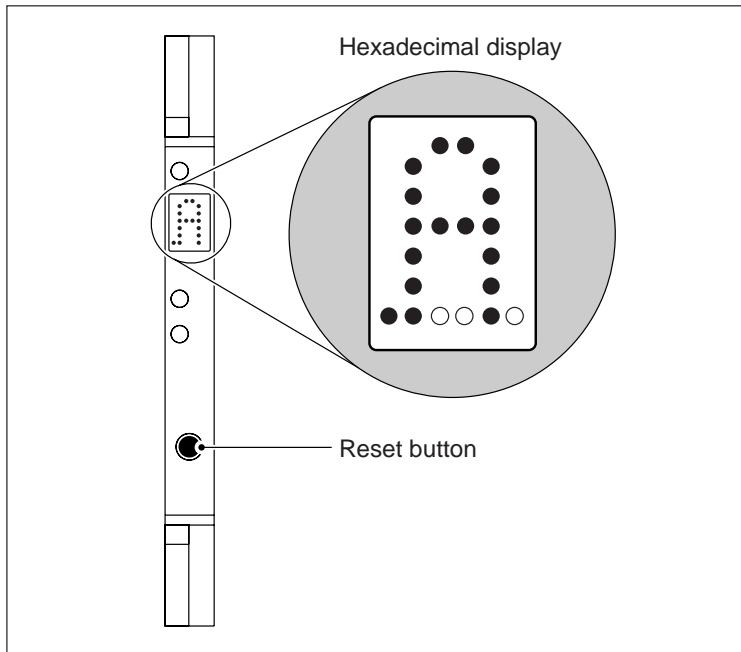
G100078

ATTENTION

To reduce stress on the system, use the RESET button on the faceplate of the Enhanced MMP40 board 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.
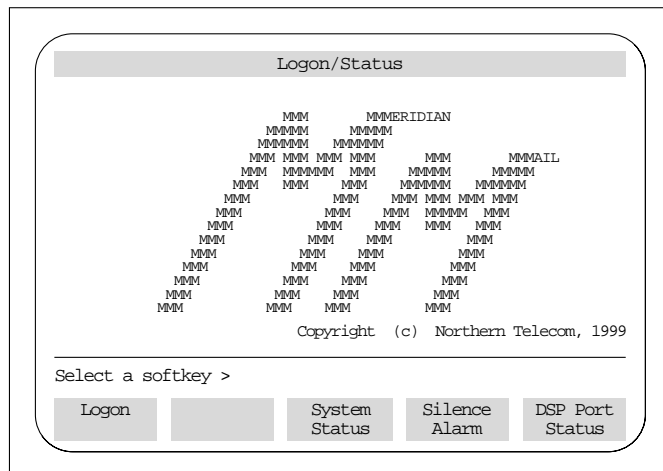
However, if there is a question regarding the state of the system after the system reset, power the system off completely, then power back on to reboot.

Step	Action
6	Check the hard copy of the bootup messages. If the word FAILED appears beside any diagnostic message, refer to Chapter 16, "Troubleshooting startup problems," for troubleshooting procedures.

Step	Action

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

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

8 To check the terminal display, press Ctrl and w.

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

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

9 Verify that the logon screen appears as shown below. Go to Chapter 14, Software Installation, in the *System Installation and Modification Guide* (NTP 555-7001-215) and install the software on the Meridian Mail system.

```
                        Logon/Status


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

                        Copyright  (c)  Northern Telecom, 1999
     ─────────────────────────────────────────────────────────
     Select a softkey >

      Logon                   System     Silence    DSP Port
                              Status     Alarm      Status
```
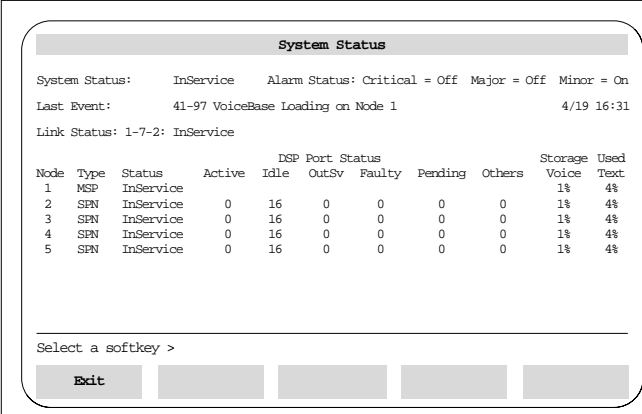
g101073

Step	Action

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

Press the [System Status] softkey.

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

Note: For a full description of this screen, see the *System Administration Guide* (NTP 555-7001-301).

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

```
                              System Status

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

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

Link Status: 1-7-2: InService

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




Select a softkey >

     Exit
```

g101074

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

12   If everything appears to be in order, press [Exit] to return to the Logon screen.

Configuring Meridian Mail

Introduction   To configure Meridian Mail, use the following steps when the
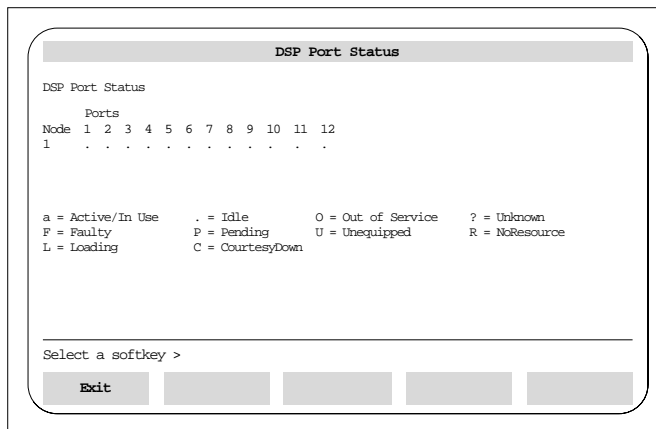Logon screen appears on the administration terminal.

Note: You may need *System Administration Tools*
(NTP 555-7001-305) and the *System Administration Guide*
(NTP 555-7001-301) to complete this procedure.

Step	Action
1	Log on to Meridian Mail using the default system user ID and password. *Note:* Meridian Mail 13 requires both a user ID and a password. See *What's New in Meridian Mail 13* (PO904567) for more information.
2	Change the administration password from the installation default.
3	Verify that remote login works by setting the A/B box switch to Remote and dialing in. *Note:* If you are using a high-speed modem (that is, one over 2400 bps such as the Ventel 9600 Plus II or the US Robotics 14.4), and the connection fails, wait 15 seconds before you attempt to reconnect.
4	Reset the A/B switch to "Local."
5	Make sure the customer number is correct. The system is delivered with the customer number already configured. Check the General Options function under the General Administration menu item.
6	Check that the voice service DNs (Voice Messaging, Express Messaging, and so on) are correctly set up. Use the Voice System Administration menu, Voice Service DN table.
7	If you have made any changes to the system, reboot the system as described below: a. Power down the system for 10 seconds, then power back on. b. Check the system by adding some mailboxes and using some Meridian Mail features.
8	Log out.

Step	Action
9	Check the status of each DSP port to make sure they are all functional. Press the [DSP Port Status] softkey. DSP Port Status should be Idle for all ports. See the illustration below. ***Note:*** For a full description of this screen, see the *System Administration Guide* (NTP 555-7001-301). This document also describes how to run out-of-service diagnostics for ports that do not come to idle status on bootup or to active status during the testing described in steps 10 to 12.

```
                        DSP Port Status

 DSP Port Status

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



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


 _____
 Select a softkey >

      Exit
```

g101075

Step	Action
10	While you watch this screen, dial the voice messaging DN from a phone connected to the switch.
11	Note which channels become active.
12	Ensure there is no noise on the line.
13	Release and repeat steps 10 to 12 until all of the ports have been tested.
14	If everything appears to be in order, press [Exit] to return to the Logon screen.
15	Replace the faceplates that cover the disk/tape drive areas.
16	Install the I/O covers and the front and rear doors of the modules.

Acceptance testing Meridian Mail

To ensure that your system works properly, follow these steps.

Step	Action
1	Check basic features by performing all functions outlined in the *Meridian Mail Voice Messaging User Guide* (P0839942).
2	Test optional features using the appropriate NTP. Refer to the *Meridian Mail NTP Contents Overview* (NTP 555-7001-000) for NTP listings for this platform.
3	Test the system and administrative features as described in the *System Administration Guide* (NTP 555-7001-301).

Chapter 14

Adding a node

In this chapter

Overview

Introduction   You can provide additional disk space or voice channels to an existing Meridian Mail Modular Option EC system by adding one or more nodes to the system.

Adding a node   You can add a node in one of two ways, based on your requirements:

- *Incremental expansion*   Add only one node and configure the system. Use this method if your system requires only the additional amount of disk space or voice channels that can be provided by the addition of one node.

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

- *multi-node expansion*   Add several nodes and configure the system based on the final node configuration (for example, two-, three-, four-, or five-node, shadowed or unshadowed, system). Use this method if your system requires an additional amount of disk space or voice channels that can only be provided by adding several nodes.

  Note: You can perform an incremental expansion to achieve the same result; however, with a multi-node expansion, you do not have to repeat the intermediary steps involved in an incremental expansion.

Getting started

Introduction
Before you continue with this section, read the "Hardware modification" section in the *System Installation and Modification Guide* (NTP 555-7001-215). It contains the full list of steps involved as well as important preparation steps.

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

Node expansion task list

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

Note 1: The procedures in this chapter refer to CEPS. Read this as DCEPS for a DC system.

Note 2: If you are adding a module, leave the front and rear doors off the new module, and remove the front and rear doors from the existing modules. Remove the I/O cover from each module.

Note 3: Fill up the voice card slots: start from the left in a given node, and begin with any VP8 cards designated for that node. For example, a configuration of VP8, VP8, VP4, VP4 is acceptable. A configuration of VP8, VP4, VP8 is not recommended; it can lead to potential software configuration problems if, in the future, you want to expand the number of ports on the node. Also, you cannot skip a voice card slot. For example, a configuration of VP8, blank, VP4 is not acceptable.

Powering up or down   The procedures in this chapter refer to powering a module on or off.

	CAUTION **Risk of equipment damage** You may blow the fuses on the Utility card if you do not follow the sequence of steps outlined in this manual to power up or power down your Meridian Mail system.

If the system has more than one Meridian Mail module, power on the modules in the following order:

1.   module MM0

2.   module MM1

3.   module MM2

Power modules off in the opposite order. If the system has more than one Meridian Mail module, power off the modules in reverse order. That is, power off module MM2, followed by module MM1, then module MM0.

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

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

Expanding unshadowed systems

Introduction   The following procedures describe how to perform an incremental expansion on an unshadowed Modular Option EC system:

CAUTION
Risk of equipment damage

Wear an antistatic wrist strap when you handle components. As an additional safety measure, handle components by the edges and, when possible, with the loosened packing material still around the component.

One- to two-node expansion (unshadowed)

Introduction   Node 2 is located at the right side of the same module as node 1.
                                     See "Adding node 2 to an unshadowed system" on page 14-7.

Expanding from a 1- to   To expand from a 1- to a 2-node unshadowed system, follow
a 2-node unshadowed   these steps.
system

Step	Action
1	Power down the module.
	Note: You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Insert the additional CEPS, Enhanced MMP40 board (slot 7), and disk drive (slot MSU4) into node 2 (Node Z) as indicated in "Adding node 2 to an unshadowed system" on page 14-7.
	Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."
3	Remove the VP4 or VP8 cards from slots 0 to 3 as necessary, and install them, along with the VPs supplied for expansion, as follows:
	a. Install 24 ports in slots 8 to 11.
	b. Install a maximum of 24 ports in slots 0 to 3.
	Note: Fill up the voice card slots: start from the left in a given node, and begin with any VP8 cards designated for that node. (See "Adding node 2 to an unshadowed system" on page 14-7.)

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

Note: Insert new hardware for expansion in slots as indicated by the shaded areas (   ) in all the figures within this chapter.

Adding node 2 to an unshadowed system

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5		Node Z			
CE Power Sup	CE Power Sup	**0** VP/ GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP/ GP	**9**	**10**	**11**

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5	Perform diagnostics as follows:

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

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

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," then go to that chapter for troubleshooting procedures.

d. Power off module MM0.

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

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

g. If the hexadecimal display on node 2's Enhanced MMP40 board does not increment to .6, then power off the module, replace the board, and try again (return to step 5 e).

6	Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion.

Step	Action
7	Configure the switch for the TNs corresponding to the ports added. See Chapter 12, "Configuring the Meridian 1," for details.

Two- to three-node expansion (unshadowed)

Introduction   Node 3 is located in the same module as nodes 1 and 2. See the
                          illustration below.

                          Note: If you are expanding to a 3-node unshadowed system,
                          you do not need the Address Jumper board.

Expanding from a 2- to   To expand from a 2- to a 3-node unshadowed system, follow
a 3-node unshadowed   these steps.
system

Step	Action
1	Power down the module.
	Note: You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Insert the Enhanced MMP40 board (slot 4) and disk drive (slot MSU3) into node 3 (Node X/Y), as indicated in the illustration below.
	Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."
	Note: Insert new hardware for expansion in slots as indicated by the shaded areas (▭) in all the figures within this chapter.

Adding node 3 to an unshadowed system

Meridian Mail Module		Node X/Y				Node Y	Node X		MSU3	MSU5		Node Z			
CE Power Sup	CE Power Sup	**0** VP/GP	**1**	**2**	**3**	**4** MMP40	**5** Util	**6** MMP40	MSU1	MSU2	MSU4	**7** MMP40	**8** VP/GP	**9**	**10** **11**

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

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

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

4   Remove the address jumper located between slots 4 and 5 of the backplane. See Chapter 8, "Configuring the backplane and inspecting the printed circuit packs," for details. Label this jumper as Address Jumper and store it. You will need this jumper if you decide later to install disk shadowing.

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

6   Perform diagnostics as follows:

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

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

   c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," see the same chapter for troubleshooting procedures.

   d. Power off module MM0.

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

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

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

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

Step	Action
7	Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion.
8	Configure the switch for the TNs that correspond to the ports added. See Chapter 12, "Configuring the Meridian 1," for details.

Three- to four-node expansion (unshadowed)

Introduction

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

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

To expand from a 3- to a 4-node unshadowed system, follow these steps.

Step	Action
1	Power down the system.
	Note: You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Install the new module. Refer to the section on "Adding a module to a column" in *SL-1 System Installation Procedures* (NTP 553-3001-210).
3	Insert the CEPS, Enhanced MMP40 board (module MM1, slot 6), and disk drive (module MM1, slot MSU2) into node 4 as indicated in "Adding node 4 to an unshadowed system" on page 14-13.
	Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."
	Note: Insert new hardware for expansion in slots as indicated by the shaded areas ([ ]) in all the figures within this chapter.

Step   Action

Adding node 4 to an unshadowed system

Module 1

Meridian Mail Module		Node X/Y				Node Y	Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	**0** VP/GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP/GP	**9**	**10** **11**

Module 0

Meridian Mail Module		Node X/Y				Node Y	Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	**0** VP/GP	**1**	**2**	**3**	**4** MMP 40	**5** Util	**6** MMP 40	MSU1	MSU2	MSU4	**7** MMP 40	**8** VP/GP	**9**	**10** **11**

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

5   Install the external voice bus (EVB) cables as shown in "Intermodule cabling for a two-module system" on page 14-14. If you did not install a utility card, install an EVB terminator on shroud S7 in module MM1 (unless you are going to have more than 48 ports). See Chapter 9, "Installing intramodule and intermodule cabling," for details.

Step   Action

Intermodule cabling for a two-module system
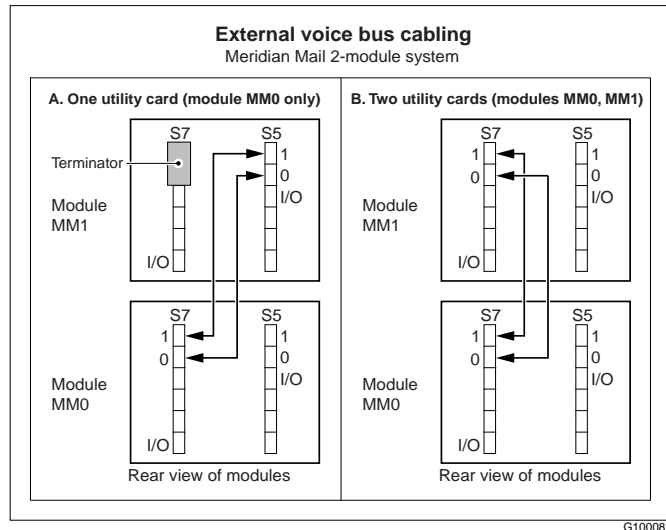
6   Verify that the switch settings on the backplanes of both
         modules are correct. See Chapter 8, "Configuring the
         backplane and inspecting the printed circuit packs," for details.

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

8   If you are going to have more than 48 ports, then do the
         following:

         a. Install a utility card in module MM1, slot 5.

         b. Install a third network loop cable from the Meridian 1 switch
            to the J4 connector on the backplane of module MM1. See
            Chapter 11, "Installing the Meridian Mail to PBX interface,"
            for details.

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

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

Module 0

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

Module 1

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

Note: Fill up the voice card slots: start from the left in a given node and begin with any VP8 cards designated for that node.

| 10 | Perform diagnostics as follows: |

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

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

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," see the same chapter for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing completes successfully, power up both modules and observe the hexadecimal display on the Enhanced MMP40 boards in the remaining nodes.

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

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

g. If the hexadecimal display on any Enhanced MMP40 board does not increment to .6, then power off the module, replace that board, and try again from step 10 e.

| 11 | Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion. |

| 12 | Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1," for details. |

Four- to five-node expansion (unshadowed)

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

Expanding from a 4- to   To expand from a 4- to a 5-node unshadowed system, follow
a 5-node unshadowed   these steps.
system

Step	Action
1	Power down the system.
	Note: You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Insert the additional CEPS, Enhanced MMP40 board (module MM1, slot 7), and disk drive (module MM1, slot MSU4) into node 5. Refer to "Adding node 5 to an unshadowed system" on page 14-17.
	Note: Before you install the disk unit, verify its jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."
3	If you are going to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.
4	If you are going to have more than 48 ports, do the following: a. Install a utility card in module MM1, slot 5. b. Install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM1. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details. c. Remove the EVB terminator, if there is one, from shroud S7 in module MM1.

Step   Action

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

        Note: Insert new hardware for expansion, in slots as indicated
        by the shaded areas (   ) in all the figures within this
        chapter.

Adding node 5 to an unshadowed system

Module 1

Meridian Mail Module		Node X/Y				Node Y		Node X			MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/ GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/ GP	9	10	11

Module 0

Meridian Mail Module		Node X/Y				Node Y		Node X			MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/ GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/ GP	9	10	11

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

        Module 0

        • Install 24 ports in slots 8 to 11.

        • Install 24 ports in slots 0 to 3.

        Module 1

        • Install 24 ports in slots 0 to 3.

        • Install a maximum of 24 ports in slots 8 to 11.

        Note: Fill up the voice card slots: start from the left in a given
        node and begin with any VP8 cards designated for that node.

Step	Action
7	Perform diagnostics as follows:

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

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

c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," then go to that chapter for troubleshooting procedures.

d. Power off module MM0.

e. If node 1 testing completes successfully, power up all the modules and observe the hexadecimal display on the Enhanced MMP40 boards in the remaining nodes.

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

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

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

| 8 | Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion. |
| 9 | Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1," for details. |

Unshadowed multi-node expansion

Introduction   You can expand an unshadowed Meridian Mail Modular Option
                            EC by several nodes at once.

**Performing a multi-   To perform a multi-node expansion on unshadowed systems,
node expansion on   follow these steps.
unshadowed systems**

Step	Action
1	Install all the required hardware (that is, CEPS, Enhanced MMP40 board, disk drives, and network cabling). Refer to the appropriate figures to determine hardware requirements and location.
	For example, if you want to expand to a four-node unshadowed system, refer to the following illustrations:
	• "Adding node 2 to an unshadowed system" on page 14-7
	• "Adding node 3 to an unshadowed system" on page 14-9
	• "Adding node 4 to an unshadowed system" on page 14-13
	Note: Insert new hardware for expansion in slots as indicated by the shaded areas (▭) in all the figures within this chapter.
2	Follow the software instructions listed in the procedure for your final node configuration.
	For example, to expand to a four-node unshadowed system, refer to "Three- to four-node expansion (unshadowed)" on page 14-12, and follow the software steps listed there.

Expanding shadowed systems

Introduction   The following procedures describe how to perform an incremental expansion on a shadowed Modular Option EC system:

- "Expanding from a 1-node to a 2-node shadowed system" on page 14-21
- "Expanding from a 2-node to a 3-node shadowed system" on page 14-23
- "Expanding from a 3-node to a 4-node shadowed system" on page 14-27
- "Expanding from a 4-node to a 5-node shadowed system" on page 14-30

To perform a multi-node expansion, refer to page 14-34.

<table>
<tr>
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CAUTION
Risk of equipment damage

Wear an antistatic wrist strap when you handle components. As an additional safety measure, handle components by the edges and, whenever possible, with the loosened packing material still around the component.

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</table>

One- to two-node expansion (shadowed)

Introduction

Node 2 is located at the right side of the same module as node 1. See the illustration below.

Expanding from a 1-node to a 2-node shadowed system

To expand from a 1-node to a 2-node shadowed system, follow these steps.

Step	Action
1	Power down the module.
	Note: You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Insert the additional CEPS, Enhanced MMP40 board (slot 7), and disk drives (slots MSU4 and MSU5) into node 2 (Node Z) as indicated in the illustration below.
	Note: Before you install the disk units, verify their jumper settings. Refer to Chapter 12, "Configuring the Meridian 1."
3	Remove the VP4 or VP8 cards from slots 0 to 3 as necessary, and install them, along with the VPs supplied for expansion, as follows:
	a. Install 24 ports in slots 8 to 11.
	b. Install a maximum of 24 ports in slots 0 to 3.
	Note: Fill up the voice card slots: start from the left in a given node and begin with any VP8 cards designated for that node. See the following illustration.

Adding node 2 to a shadowed system

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Step	Action

4   If you plan to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of the module. See Chapter 11, "Installing the Meridian Mail to PBX interface."

5   Perform diagnostics as follows:

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

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

   c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," then go to that chapter for troubleshooting procedures.

   d. Power off module MM0.

   e. If node 1 testing completes successfully, power up module MM0 again and observe the hexadecimal display on node 2. The hexadecimal displays should increment to at least .6 on each non-prime node.

   f. After the hexadecimal display on node 2's Enhanced MMP40 board reaches .6, the testing successfully completes. Power off the module and proceed with the software expansion (step 6).

   g. If the hexadecimal display on node 2's Enhanced MMP40 board does not increment to .6, then power off the module, replace the board, and try again from step 5 e.

6   Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion.

7   Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1," for details.

Two- to three-node expansion (shadowed)

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

Expanding from a 2-node to a 3-node shadowed system
To expand from a 2- to a 3-node shadowed system, follow these steps.

Step	Action
1	Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1," for details. ***Note:*** You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Install the new module. Refer to the section on "Adding a module to a column" in *SL-1 System Installation Procedures* (NTP 553-3001-210).
3	Insert the CEPS, Enhanced MMP40 board (module MM1, slot 6), and disk drives (module MM1, slots MSU2 and MSU3) into node 3 (Node X/Y) as indicated in "Adding node 3 to a shadowed system" on page 14-24. ***Note:*** Before you install the disk units, verify their jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."
4	If you need extra RS-232 ports, install a utility card (module MM1, slot 5).
5	Install the EVB cables as shown in "Intermodule cabling for a two-module system" on page 14-25. If you did not install a utility card, install an EVB terminator on shroud S7 in module MM1. See Chapter 9, "Installing intramodule and intermodule cabling," for details.

Step   Action

6   Verify that the switch settings on the backplanes of both modules are correct. See Chapter 8, "Configuring the backplane and inspecting the printed circuit packs," for details.

Adding node 3 to a shadowed system

Module 1

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/GP	9	10	11

Module 0

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/GP	9	10	11

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

Module 0
•   Install 24 ports in slots 8 to 11.

Module 1
•   Install a maximum of 24 ports in slots 0 to 3.

Note: Fill up the voice card slots: start from the left in a given node and begin with any VP8 cards designated for that node.

Step	Action
8	If you plan to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.

Intermodule cabling for a two-module system
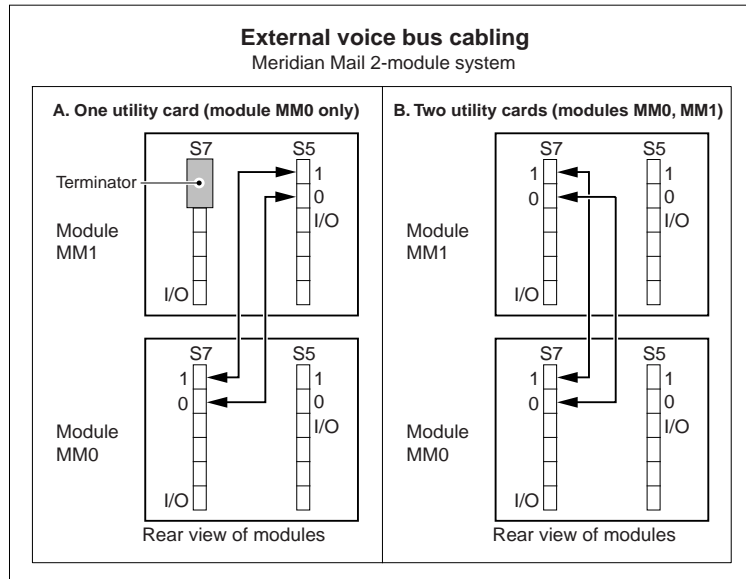
G100081

9	Perform diagnostics as follows:
	a. Check that the main administration terminal is connected to node 1.
	b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's Enhanced MMP40 board.
	c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," then go to that chapter for troubleshooting procedures.
	d. Power off module MM0.

Step	Action

<table>
<tr><td></td><td>e.</td><td>If node 1 testing completes successfully, power up all the modules and observe the hexadecimal display on the Enhanced MMP40 boards in the remaining nodes.

The hexadecimal displays should increment to at least .6 on each non-prime node.</td></tr>
<tr><td></td><td>f.</td><td>After the hexadecimal display on each non-prime node's Enhanced MMP40 board reaches .6, the testing successfully completes. Power off all modules and proceed with the software expansion (step 10).</td></tr>
<tr><td></td><td>g.</td><td>If the hexadecimal display on any Enhanced MMP40 board does not increment to .6, then power off the module, replace that board, and try again (return to step e.).</td></tr>
<tr><td>10</td><td colspan="2">Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion.</td></tr>
<tr><td>11</td><td colspan="2">Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1," for details.</td></tr>
</table>

Three- to four-node expansion (shadowed)

Introduction   Node 4 is located in the same module as node 3.

Expanding from a 3-node to a 4-node shadowed system   To expand from a 3- to a 4-node shadowed system, follow these steps.

Step	Action
1	Power down the module. ***Note:*** You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Insert the additional CEPS, Enhanced MMP40 board (module MM1, slot 7), and disk drives (module MM1, slots MSU4 and MSU5) into node 4 as indicated in the illustration below. ***Note:*** Before you install the disk units, verify their jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."

Adding node 4 to a shadowed system

Module 1

Meridian Mail Module		Node X/Y				Node Y		Node X			MSU3	MSU5		Node Z			
CE Power Supply	CE Power Supply	0 VP/GP	1	2	3	4 MMP40	5 Util	6 MMP40	MSU1	MSU2	MSU4	7 MMP40	8 VP/GP	9	10	11

Module 0

Meridian Mail Module		Node X/Y				Node Y		Node X			MSU3	MSU5		Node Z			
CE Power Supply	CE Power Supply	0 VP/GP	1	2	3	4 MMP40	5 Util	6 MMP40	MSU1	MSU2	MSU4	7 MMP40	8 VP/GP	9	10	11

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Step	Action
3	If you need extra RS-232 ports, install a utility card (module MM1, slot 5), and remove the EVB terminator, if there is one, from shroud S7 in module MM1.

Step	Action
4	If you plan to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.
5	To have more than 48 ports do the following:

    a. Install a utility card in module MM1, slot 5.

    b. Install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM1. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.

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

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

Module 0

• Install 24 ports in slots 8 to 11.

Module 1

• Install 24 ports in slots 0 to 3.

• Install a maximum of 24 ports in slots 8 to 11.

Note: Fill up the voice card slots: start from the left in a given node and begin with any VP8 cards designated for that node.

| 7 | Perform diagnostics as follows: |

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

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

    c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," then go to Chapter 17 for troubleshooting procedures.

    d. Power off module MM0.

    e. If node 1 testing successfully completes, power up both modules and observe the hexadecimal display on the Enhanced MMP40 boards in the remaining nodes.

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

Step	Action
	f. After the hexadecimal display on each non-prime node's Enhanced MMP40 board reaches .6, the testing successfully completes. Power off all modules and proceed with the software expansion (step 8).
	g. If the hexadecimal display on any Enhanced MMP40 board does not increment to .6, then power off the module, replace that board, and try again (return to step 7 e).
8	Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion.
9	Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1," for details.

Four- to five-node expansion (shadowed)

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

Expanding from a   To expand from a 4- to a 5-node shadowed system, follow these
4-node to a 5-node   steps.
shadowed system

Step	Action
1	Power down the system. ***Note:*** You must properly courtesy down the system before you can power down. For more information on courtesy down procedures, refer to the "System status and maintenance" chapter in the *System Administration Guide* appropriate to your site.
2	Install the new module. Refer to the section on "Adding a module to a column" in *SL-1 System Installation Procedures* (NTP 553-3001-210).
3	Remove the EVB terminator, if there is one, from shroud S7 in module MM1.
4	Insert the CEPS, Enhanced MMP40 board (module MM2, slot 6), and disk drive (module MM1, slots MSU2 and MSU3) into node 5 as indicated in "Adding node 5 to a shadowed system" on page 14-31. ***Note:*** Before you install the disk units, verify their jumper settings. Refer to Chapter 7, "Installing the disk drives and tape drive."
5	If you have a utility card in module MM1, move it to module MM2, slot 5. Remove the EVB terminator, if there is one, from shroud S7 in module MM2.
6	If you plan to have more than 24 ports, install a second network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM0. See Chapter 11, "Installing the Meridian Mail to PBX interface."

Step	Action
7	If you are going to have more than 48 ports, do the following:
	a. Install a utility card in module MM2, slot 5.
	b. Install a third network loop cable from the Meridian 1 switch to the J4 connector on the backplane of module MM2. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.
	c. Remove the EVB terminator, if there is one, from shroud S7 in module MM2.
8	If you plan to have more than 72 ports, install a fourth network loop cable from the Meridian 1 switch to the J5 connector on the backplane of module MM2. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.

Adding node 5 to a shadowed system

Module 2

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/ GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/ GP	9	10	11

Module 1

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/ GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/ GP	9	10	11

Module 0

Meridian Mail Module		Node X/Y				Node Y		Node X		MSU3	MSU5	Node Z				
CE Power Supply	CE Power Supply	0 VP/ GP	1	2	3	4 MMP 40	5 Util	6 MMP 40	MSU1	MSU2	MSU4	7 MMP 40	8 VP/ GP	9	10	11

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Step	Action

9   Install the EVB cable as shown in the illustration below.

Intermodule cabling for a three-module system

G100081
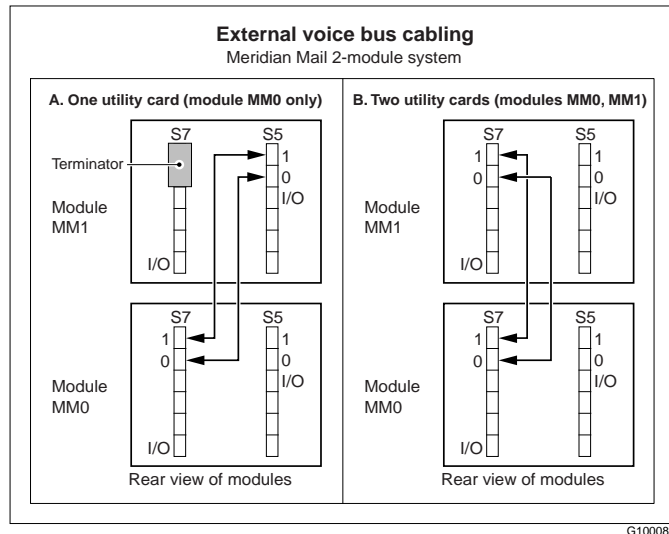
10   Ensure that the switch settings on the backplanes of all three modules are correct. See Chapter 8, "Configuring the backplane and inspecting the printed circuit packs," for details.

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

Module 0

• Install 24 ports in slots 8 to 11.

Module 1

• Install 24 ports in slots 0 to 3.

• Install 24 ports in slots 8 to 11.

Module 2

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

Note: Fill up the voice card slots: start from the left in a given node and begin with any VP8 cards designated for that node.

Step	Action
12	Perform diagnostics as follows:
	a. Check that the main administration terminal is connected to node 1.
	b. Power up module MM0 and observe the node 1 bootup messages on the terminal and the hexadecimal display on node 1's Enhanced MMP40 board.
	c. If the terminal output or the hexadecimal display does not follow the normal bootup sequence described in Chapter 17, "Troubleshooting operational problems," then go to Chapter 17 for troubleshooting procedures.
	d. Power off module MM0.
	e. If node 1 testing successfully completes, power up all the modules and observe the hexadecimal display on the Enhanced MMP40 boards in the remaining nodes.
	The hexadecimal displays should increment to at least .6 on each non-prime node.
	f. After the hexadecimal display on each non-prime node's Enhanced MMP40 board reaches .6, the testing successfully completes. Power off all modules and proceed with the software expansion (step 13).
	g. If the hexadecimal display on any Enhanced MMP40 board does not increment to .6, then power off the module, replace that board, and try again (return to step 12 e).
13	Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215) for further instructions on how to complete the expansion.
14	Configure the switch for the TNs that correspond to the added ports. See Chapter 12, "Configuring the Meridian 1", for details.

Shadowed multi-node expansion

Introduction

You can expand a shadowed Meridian Mail Modular Option EC by several nodes at once.

Performing a multi-node expansion on shadowed systems

To perform a multi-node expansion on shadowed systems, follow these steps.

Step	Action
1	Install all the required hardware (that is, CEPS, Enhanced MMP40 board, disk drives, and network cabling). Refer to the appropriate figures to determine hardware requirements and location. For example, if you want to expand to a four-node shadowed system, refer to the following illustrations: • "Adding node 2 to a shadowed system" on page 14-21 • "Adding node 3 to a shadowed system" on page 14-24 • "Adding node 4 to a shadowed system" on page 14-27 ***Note:*** Insert new hardware for expansion in slots as indicated by the shaded areas ( ) in all the figures within this chapter.
2	Follow the software steps outlined in the procedure for your final node configuration. For example, if your final configuration was a four-node shadowed system, refer to "Three- to four-node expansion (shadowed)" on page 14-27 and follow the software steps listed there.

Chapter 15

Converting from an existing Modular Option EC system to Release 13

In this chapter

Overview

Introduction   This chapter describes the hardware changes required when converting from an existing Modular Option EC system to a Meridian Mail Release13 system. If you are also expanding the system (adding nodes), complete the conversion on the existing system first and then refer to Chapter 14 for a complete task list for adding a node.

Before beginning system installation

Introduction

Before beginning the system installation and modification procedures, unpack and inspect any new printed circuit packs as described in Chapter 4. Then refer to the *System Installation and Modification Guide* (NTP 555-7001-215) to begin the conversion.

Enhanced MMP40

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

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

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

Hardware conversion requirements

Hardware conversion requirements for Release 13 depend on whether your system already has Enhanced MMP40 cards installed. The conversion is also affected by the selected terminal baud rate (2400 or 9600 bps). See "Hardware requirements" on page 15-4 for an overview of the hardware requirements for each conversion scenario.

Hardware requirements

Introduction   The following table describes the hardware changes that are required when converting a system to Release 13.

Hardware	Current configuration	After conversion	Hardware change required
CPU card	68K card in any node	Enhanced MMP40 card in each node	Insert Enhanced MMP40 card in every node. See "Replacing the 68K card" on page 15-5.
	Enhanced MMP40 or MMP40 card in each node	No change	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 "Installing a 9600 bps modem" on page 15-6.
Tape drive	Archive Viper	Archive Viper	No change
	Archive Viper	Tandberg	Install Tandberg tape drive. See Chapter 7, "Installing the disk drives and tape drive."

System conversion   All Enhanced MMP40 cards are shipped from the factory with a default baud setting of 2400 bps. If you use a 9600 bps for your system, you must configure a modem for 9600 bps use. After the Enhanced MMP40 cards are installed, with high-speed modems if required, complete a system conversion to the Meridian Mail Release 13.0 software.

Use the Install tape to convert the existing Modular Option EC system to Release 13. If the existing system is operating with pre-MM10 software, then both the terminal and the remote support modem must be set to 2400 bps.

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

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

For 2400 bps systems, no additional steps are required once the conversion completes successfully (as described in the *System Installation and Modification Guide*).

Use the speed change utility to set the system speed (for example 9600 bps) *after* the conversion completes successfully. You run the utility after the conversion so that, if the conversion fails, the system can be restored to its previous state without having to reset the terminals and modems. See the *System Installation and Modification Guide* for details.

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

Replacing the 68K card

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

To replace a 68K card, follow these steps.

Step	Action
1	Unpack and inspect the new hardware as described in Chapter 4, "Unpacking and inspecting the equipment."
2	Refer to the "Comprehensive upgrade" chapter in the *System Installation and Modification Guide* (NTP 555-7001-215). Follow the instructions, 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.

Step	Action
4	Open the ejectors on the 68K card you are replacing and gently pull the card toward you until it clears the shelf (see the illustration).
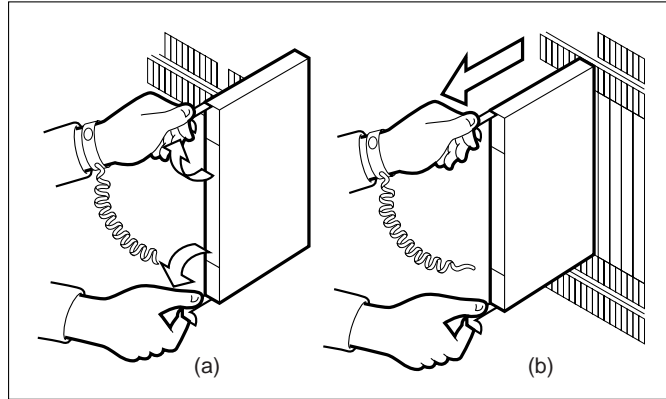
G100044

5	Store the 68K card in a safe place. You require this card if you need to reinstall the old system.
6	Insert the Enhanced MMP40 card in the module by aligning it with the slots in the module formerly occupied by the 68K card.
7	With the ejectors in the open position, gently slide the card into the module.
8	To seat and lock the card: a. Push on the upper and lower edges of the faceplate until the card is fully seated in the module. b. Close the ejectors.
9	Install the supplied designation strips (A0803253) on the Meridian Mail shelves.
10	Return to the *System Installation and Modification Guide* to continue the system conversion. You are now finished all the required hardware changes.

Installing a 9600 bps modem

If you decide to upgrade your terminal baud rate to 9600 bps, you must also configure the modem to operate at 9600 bps before the system conversion can be completed.

If you are using a new high-speed modem, unpack and inspect it. If you want to use an existing 2400 bps modem, ensure that it

is supported for 9600 bps use. Refer to Appendix B, "Modem configurations," to ensure the modem is supported for 9600 bps.

To install the 9600 bps modem, follow these steps.

Step	Action
1	Install the external modem as outlined in Chapter 10, "Installing, cabling, and configuring peripheral devices."
2	Refer to Appendix B, "Modem configurations," for instructions on how to configure the modem.
3	Return to the *System Installation and Modification Guide* to continue the system conversion. You are now finished all the necessary hardware changes.

Chapter 16

Troubleshooting startup problems

In this chapter

Overview

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

Powering down a node   Several troubleshooting procedures recommend that you power
or the system   down a node or the entire system. You can power down a node
                           that does not contain a utility card at any time without affecting
                           call activity on other nodes.

                           If the node to be powered down contains a utility card, you must
                           power down the entire system.

> **CAUTION**
> **Risk of equipment damage**
>
> You may blow the fuses on the utility card
> if you do not follow the sequence of steps
> outlined in this manual to power up or
> power down your Meridian Mail system.

                           If you need to power down the entire system, begin by
                           performing a courtesy down procedure, then disable the nodes,
                           and finally power down the system. This ensures that users do
                           not experience abrupt termination of service.

                           For more information on how to courtesy down nodes and
                           the system, refer to the *System Administration Guide*
                           (NTP 555-7001-301).

                           If the system has more than one Meridian Mail module, power
                           off module MM2, followed by module MM1, followed by
                           module MM0. Power on the modules in the opposite order.

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

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

Reference documents   Documents that are referenced for maintenance or troubleshooting procedures in this manual are as follows:

- *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

Introduction

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

The Enhanced MMP40 (or MMP40) initialization phase can be monitored using the hexadecimal display on the Enhanced MMP40 card. The bootup can usually be monitored using the text displayed on the terminal. The following sections describe the LED, hexadecimal display, and progression through bootup.

Note: If you encounter difficulty during a normal startup sequence, refer to Appendix C, "Enhanced MMP40 (or MMP40) troubleshooting flowcharts," to determine causes and solutions of potential problems.

Power on initialization—LED and hexadecimal display description

A hexadecimal display on the upper-front edge of the Enhanced MMP40 (or MMP40) card provides information for diagnosing some system problems in the field. See "Hexadecimal display on Enhanced MMP40 card" on page 16-5.

Hexadecimal display on Enhanced MMP40 card

Hexadecimal display

Reset button
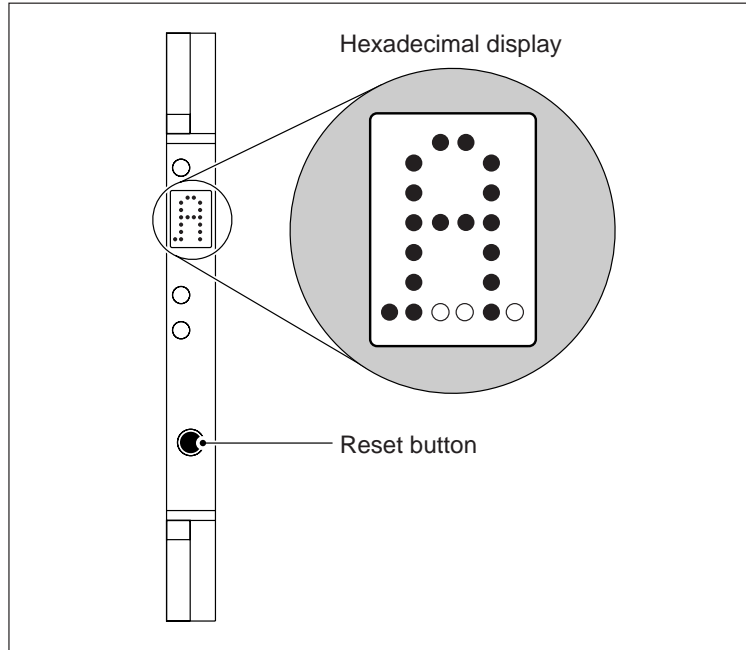
G100078

> **CAUTION**
> **Risk of equipment damage**
>
> The fuses on the utility card can blow if
> you do not follow the sequence of steps
> outlined in this manual to power up or
> power down your Meridian Mail system.

When the hardware powers up both decimal points are on, with
the remainder of the display blank. On a normally functioning
Enhanced MMP40 (or MMP40) board, this state is generally
not seen because of the very quick transition to the .0 state.

"Typical startup indications on hexadecimal display" on page
16-6 shows the typical progression of the startup indications.

On other Meridian Mail components, the LEDs can also be used
to check that the startup is proceeding normally (see "Behavior
of LED indicators" on page 16-6).

Typical startup indications on hexadecimal display

Display shows	Description
. .	Power on (displays *very* briefly).
.0	Begin execution of BootROM.
.1 to .4	Initialization progressing.
During normal bootup, the terminal displays (described at "Normal bootup sequence" on page 16-7) 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).

Behavior of LED indicators

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

Normal bootup sequence

Introduction

Once the initialization is complete, the system begins to boot up.

Messages on terminal

A series of messages appear on the terminal. In a normal bootup, the system passes through several distinct stages as different elements of Meridian Mail are brought up.

"Bootup stages—Enhanced MMP40 (or MMP40) system" on page 16-8 shows the key phrases that inform you the various stages are proceeding normally. The intermediate text between these key phrases is omitted, since its content is dependent on your specific configuration.

You can print a hard copy of the bootup sequence. See the procedure below.

Printing a hard copy of the bootup sequence

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

Step	Action
1	Restart the system.
2	Press Ctrl and PrintScreen to turn on automatic printing. The bootup messages begin printing and "Aut." appears at the bottom of the terminal screen.
3	When you are finished printing, press Ctrl and PrintScreen again to turn off automatic printing.
4	Compare the bootup printout to the information presented in "Bootup stages—Enhanced MMP40 (or MMP40) system" on page 16-8.

Problems with bootup

If bootup does not proceed as described in "Bootup stages—Enhanced MMP40 (or MMP40) system" on page 16-8, see "Bootup problems" on page 16-13. You can also refer to Appendix C, "Enhanced MMP40 (or MMP40) troubleshooting flowcharts," to determine causes and solutions to problems with the Enhanced MMP40 card.

Bootup stages—Enhanced MMP40 (or MMP40) system

Stage	Key phrases	Comments

1	Waiting for timer...
	
	 .
	
	 .
	
	 .
	
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	     * NT4R45aa Firmware *
	     * Enhanced MMP40FW *
	     * Mmmm DD, YYYY *
	    **********************
	
	 .
	
	 .
	
	 .
		Where "aa" can be any two letters and "Mmmm DD, YYYY" is the release date of the firmware.

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

3	Performing SCSI Bus Reset...OK. . .	Executing SCSI controller tests.
4	SCSI initialization complete. . .	Executing SCSI controller tests.

Normal bootup sequence

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.

Stage	Key phrases	Comments
10	PRM Running startup diagnostics . . . PRM: OSP is Up - node 2 . . .	Diagnostic programs are run On multi-node systems, operating system (OS) is loaded on non-prime nodes.
11	PRM: Startup diags finished, starting up system	Application programs are to be loaded.
12	The Logon screen comes up as shown below.	

When the bootup and bootROM diagnostic messages end, the Meridian Mail logon screen appears.
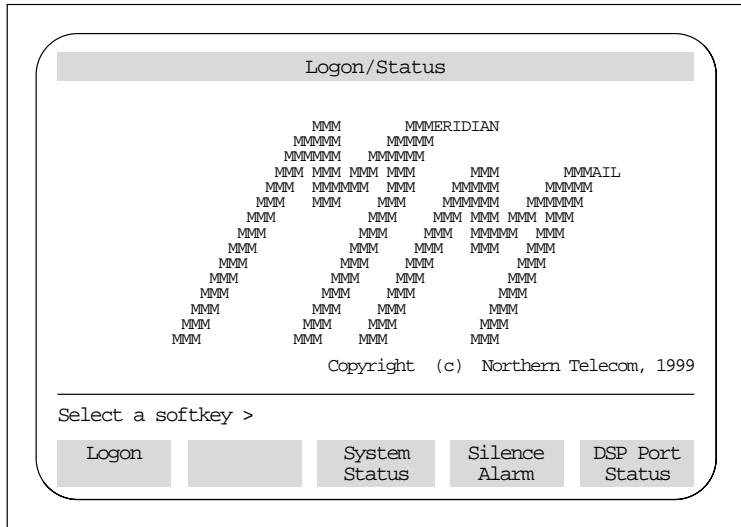
g101073

System status   Check the system status to make sure the channels are functional and all links are up. Press the [System Status] softkey. If the channels are functional and all the links are up, then

• Node status is InService for all nodes.

- Link status is InService.
- DSP Port Status is Idle for all the installed voice ports.

See the following illustration.

System Status screen (5-node system)

```
                    System Status and Maintenance

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

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

Link Status: 1-7-2: InService

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




Select a softkey >

    Exit
```

g101076

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

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

For further details on voice channel status, press [Exit] then
[DSP Port Status]. The DSP Port Status screen appears. See
page 16-12.

DSP Port Status screen

```
                          DSP Port Status

DSP Port Status

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




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




_____

Select a softkey >
```

Exit				
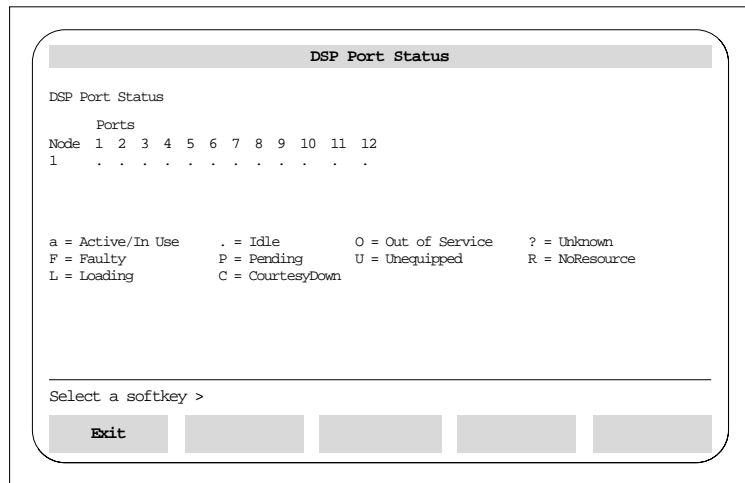
g101075

Bootup problems

Symptom	Possible causes and actions
The admin terminal screen remains blank.	Follow "Correcting a blank terminal" on page 16-15.
Messages stop appearing on the screen, but the Meridian Mail logon screen does not appear.	Follow the procedures in "System fails to boot completely" on page 16-24.
When the System Status screen is checked, a node is faulty.	Check SEERs for failed hardware diagnostics.
	Follow the actions documented for the SEERs in the *Maintenance Messages (SEERS) Guide* (NTP 555-7001-510).
	If all non-prime nodes (type SPN) are faulty, check the system bus. Follow "Performing system bus diagnostics" on page 16-31.
	If only one node is faulty, run OutOfService Diagnostics on that node's CPU card.
The logon screen appears, but node status remains Loading.	Check SEERs for programs that could not be loaded.
	Follow the actions documented for the SEERs in the *Maintenance Messages (SEERS) Guide* (NTP 555-7001-510).
The node continually reboots.	1. Replace the CPU card.
	2. Perform the system bus checks. Follow "Performing system bus diagnostics" on page 16-31.
The logon screen appears, but not all voice channels come into service.	Ports may be left Faulty or unconfigured due to hardware problems. Review port status on the DSP Port Status screen. Ports may be left Loading, Pending, or No Resources due to configuration or software problems.
	Run OutOfService Diagnostics as described in the *System Administration Guide* (NTP 555-7001-30x), and then enable the voice card.
There are disk errors on the bootup-device sense key, or driver errors.	Refer to "Troubleshooting stage 3 bootup failure—disk subsystem check" on page 16-26 and "Troubleshooting stage 4 bootup failure" on page 16-27, as well as Chapter 19, "Common disk subsystem problems."
All nodes time-out while booting, or nodes unload while in service.	1. Perform the system bus checks. Follow "Performing system bus diagnostics" on page 16-31.
	2. Perform BootROM diagnostic check procedure for the node.

Symptom	Possible causes and actions
Only one node comes up.	Perform the system bus checks. Follow "Performing system bus diagnostics" on page 16-31.
The logon screen appears, but link status is not InService.	Refer to "AML problems" on page 17-7.
One node will not come up.	Perform the BootROM diagnostic check procedure for the node.
The hexadecimal display on Enhanced MMP40 card shows "B."	This indicates that the node is in-service standby. This is a minor software error. Contact your Nortel Networks support organization.
The hexadecimal display on Enhanced MMP40 card shows "C."	This indicates that the node is out of service. Enable the node from the MMI as described in the *System Administration Guide* (NTP 555-7001-30x).
The hexadecimal display on Enhanced MMP40 card shows "D."	This indicates in-service trouble. While the Enhanced MMP40 card is still healthy, a component such as a VP card or a disk may be faulty. Check the VP cards for that node, use "Troubleshooting stage 3 bootup failure—disk subsystem check" on page 16-26 and "Troubleshooting stage 4 bootup failure" on page 16-27, and refer to Chapter 19, "Common disk subsystem problems."
The hexadecimal display on the Enhanced MMP40 card (blinking dot during states "1" and later) has stopped blinking.	This indicates a potential software problem or faulty display. Note the state at which the dot stopped blinking, and whether the system is running normally. Reboot the system and observe the display. If the problem persists, contact your Nortel Networks support organization.
The hexadecimal display on Enhanced MMP40 card flashes continuously.	This indicates a faulty Enhanced MMP40 card. 1. Note the state at which the display began flashing. 2. Replace the Enhanced MMP40 card.
The hexadecimal display on Enhanced MMP40 card returns to .0 state.	The system has detected an unrecoverable hardware fault and is attempting to restart the node. If the system is unable to reboot the node successfully, note the display immediately before the state reverts to .0, and contact your Nortel Networks support organization.
The hexadecimal display on Enhanced 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 Networks support organization.

Troubleshooting terminal problems

Introduction   The procedures contained in the following sections help you
determine if there is a problem with the Meridian Mail terminal
or the prime node Enhanced MMP40 (or MMP40) card. Follow
each step in the troubleshooting procedures until you have
resolved the problem.

Correcting a blank   To resolve the problem of a blank terminal, follow these steps.
terminal

Step	Action
1	Reboot the system, and observe the hexadecimal display on the prime node's Enhanced MMP40 card.
	If the display stops at .3, then there is a problem with the terminal or its connection.
2	If the power LED on the terminal is not lit, check for power problems as follows:
	a. Check that the terminal power switch is on.
	b. Verify that there is power at the socket where the terminal is plugged in.
	c. Check the power cord, and replace it if necessary.
	d. If all of the above tests are OK, replace the terminal.
	e. Check the terminal cabling and setup as described in "Determining a problem with terminal cables and setup" on page 16-16.
	f. If the power LED remains unlit, replace the prime node's Enhanced MMP40 card and return to step 1 of this procedure.
3	If the hexadecimal display does not increment past .3 or remains blank, proceed as follows:
	a. Check for Meridian Mail power problems as described in "Preliminary action" on page 16-18, "Resolving DC system power problems" on page 16-18, "Testing the pedestal power supply" on page 16-19, "Testing the power harness" on page 16-20, and "Testing the DCEPS" on page 16-21.
	b. If these tests fail, replace the prime node's Enhanced MMP40 card and return to step 1.

Step	Action
4	If the hexadecimal display increments past .3 but the screen remains blank, there may be a problem with the Enhanced MMP40 (or MMP40) card. Replace the card and return to step 1.
5	If none of these steps succeeds in solving the problem, contact your Nortel Networks support organization.

Determining a problem with terminal cables and setup

To determine if the problem with the terminal involves the terminal cables and setup, follow these steps.

Step	Action
1	Make sure the terminal is installed and configured as described in Appendix A, "Terminal configuration."
2	If the terminal was working previously, enter terminal setup and perform "Clear communications," then reset the terminal.
3	If the terminal was working previously and the printer is printing SEER reports, enter terminal setup and verify that the terminal is not in controller print mode. The print mode should be Normal Print Mode for all terminals, except the HP700/32. For the HP700/32, enter terminal setup and set the user Aux Mode to OFF.
4	Verify 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 the cable connections to the terminal.
6	Replace the cables and adapters one at a time.
7	Check the printer setup and status. Refer to Chapter 10, "Installing, cabling, and configuring peripheral devices" for the correct printer setup.
8	Clear any printer faults (out of paper, paper jam) and put the printer online.
9	To make sure the terminal is functional, enter setup mode.
10	Change the terminal setup to enable LOCAL ECHO, and, with the printer attached, enter text from the terminal keyboard. *Result:* The text you enter from the keyboard should echo on the terminal screen.

Step	Action
11	Disable LOCAL ECHO.
12	Check the terminal's primary port using the method described in the terminal owner's manual.
13	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.
14	If all of the above tests are OK, and none of the replacements fixes the problem, replace the terminal.

Power problems

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

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

If the problem is not fixed, refer to "Resolving DC system
power problems" below or "Resolving AC system power
problems" on page 16-22 as appropriate.

Resolving DC system   To resolve DC system power problems, follow these steps.
power problems

Step	Action
1	Remove the front doors from all modules in the system.
2	If no LEDs are lit on any module, go to "Testing the pedestal power supply" on page 16-19.
3	If no LEDs are lit on any module above a certain module, go to "Testing the power harness" on page 16-20 and test the power harness at the lowest module with no LEDs lit.
4	If no LEDs, including the LEDs on the CEPS, are lit on a single module or on a single side of a module, go to "Testing the DCEPS" on page 16-21.
	Note: A side of a module that contains a power supply but no PCPs or disk drives will give a DCEPS failure indicator.

Testing the pedestal power supply

To test the pedestal power supply, follow these steps.

Step	Action
1	Verify main DC voltage by measuring for –48 V DC to –52 V DC.
	a. To measure this voltage, use a volt/ohmmeter. Measure between each BAT terminal (0/1, 2/3) and the corresponding BATRTN terminal. See Universal DC pedestal, NT7D67CA below (NT7D67CA PDU) and "DC pedestal, NT6D53AA" on page 16-20 (NT6D53AA PDU).
	b. If the voltage measured is incorrect, test the UPS system. See *SL-1 Fault Clearing* (NTP 553-3001-510) for testing procedures of the UPS.
2	If the voltage is correct, go to "Testing the power harness" on page 16-20 and test the power harness at the lowest module with no LEDs lit.

Universal DC pedestal, NT7D67CA

G101077

DC pedestal, NT6D53AA

Measure between each BAT terminal (0/1, 2/3) and the corresponding BATRTN terminal.
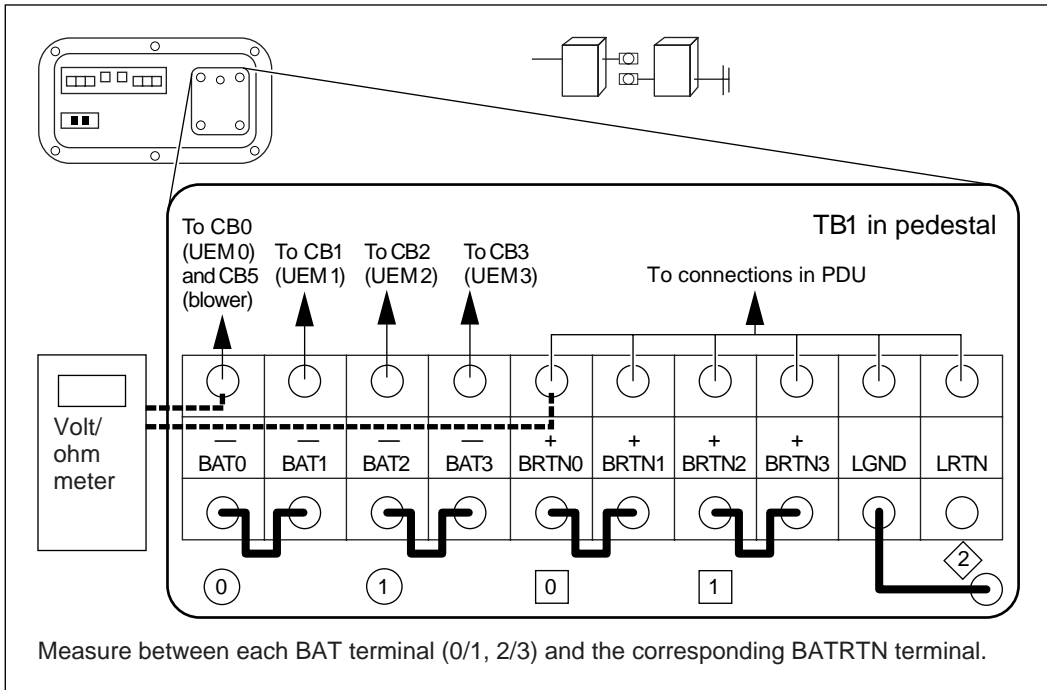
G101078

Testing the power harness

To test the power harness, follow these steps.

Step	Action
1	Check the DC voltage at DCEPS connectors (see "Front view of module, DCEPS or CEPS removed" on page 16-21).
	a. Switch off both DCEPS on the module.
	b. Remove both DCEPS.
	c. Check the voltage at the pins shown in "Front view of module, DCEPS or CEPS removed" on page 16-21.
	d. If the voltage is not in the range of –48 V DC to –52 V DC, refer to *SL-1 Fault Clearing* (NTP 553-3001-510).
2	If the voltage is correct, continue with "Testing the DCEPS" on page 16-21.

Front view of module, DCEPS or CEPS removed

Ground

48 V DC
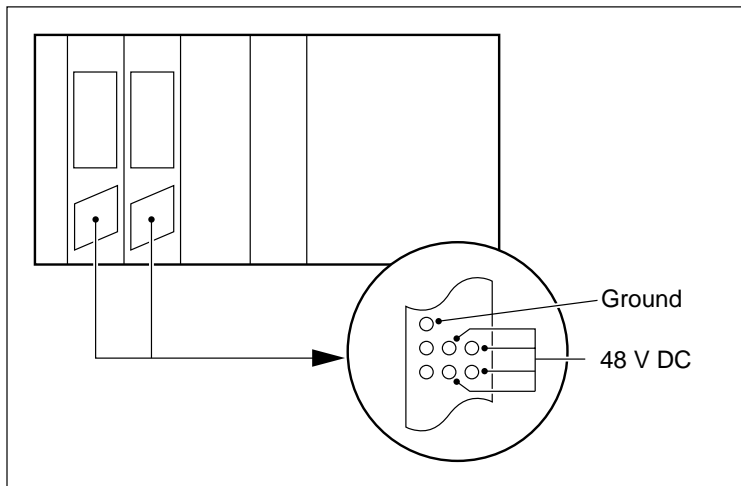
G100096

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

Step	Action
1	Power down the DCEPS if it is not already powered down.
2	Swap the DCEPS with a new one.
3	Reboot the system to full service.
4	Return the faulty DCEPS for service or replacement.
5	If the system fails to boot, go to "System fails to boot completely" on page 16-24.

Resolving AC system power problems

To resolve AC system power problems, follow these steps.

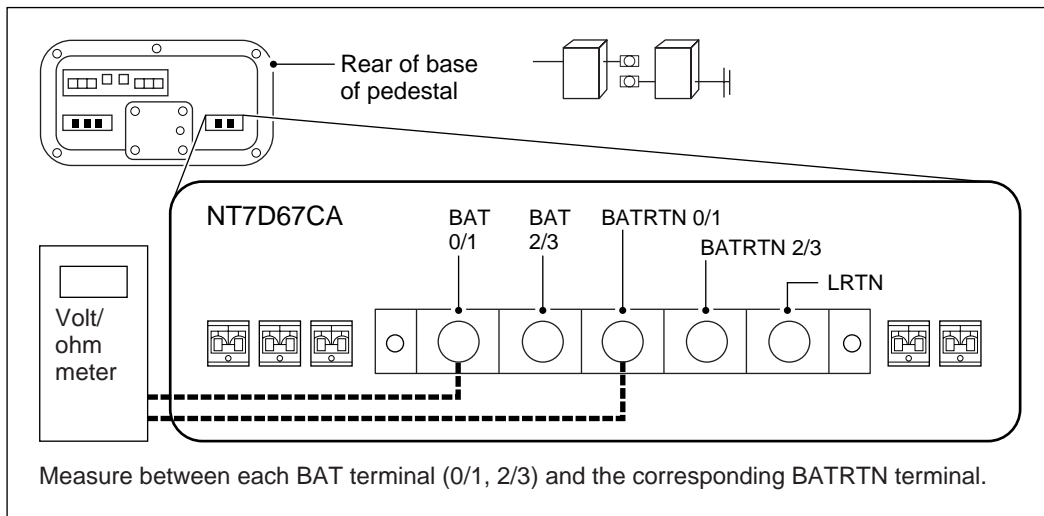| Step	Action
1	Remove the front doors from all modules in the system.
2	If no LEDs are lit on any module above a certain module, go to the procedure that follows and test the pedestal power supply and power harness at the lowest module that has no lit LEDs.
3	If no LEDs, including the LEDs on the CEPS, are lit on a single module or on a single side of a module, go to "Testing the CEPS" on page 16-23. ***Note:*** A side of a module that contains a power supply but no PCPs or disk drives will indicate a CEPS failure.

Testing the power harness and pedestal power supply

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

Step	Action
1	Check the AC voltage at the CEPS connectors (see "Front view of module, CEPS removed" on page 16-23). a. Switch off both breakers on the module. b. Remove both CEPS. c. Check the voltage at the pins shown in "Front view of module, CEPS removed" on page 16-23. d. If the voltage is incorrect, refer to *SL-1 Fault Clearing* (NTP 553-3001-510).
2	If the voltage is correct, continue with "Testing the CEPS" on page 16-23.

Front view of module, CEPS removed
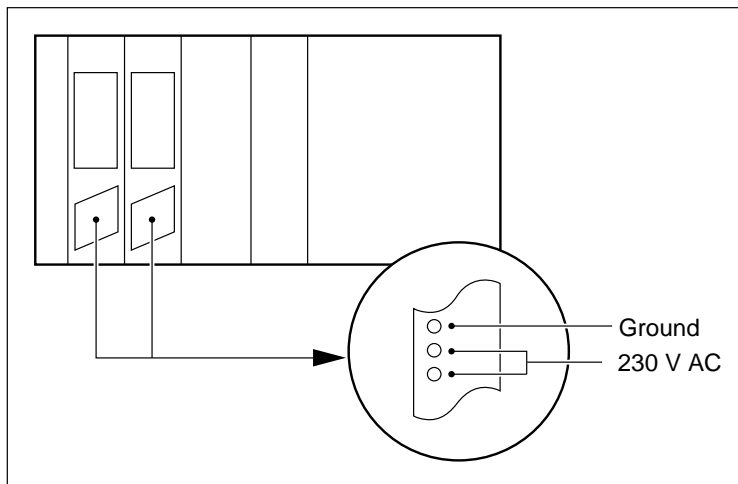
G100434

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

Step	Action
1	Use the shelf breakers to power off the module if the module's power is not already off.
2	Swap the CEPS with a new one.
3	Reboot the system to full service.
4	Return the faulty CEPS for service or replacement.
5	If the system fails to boot, go to "System fails to boot completely" on page 16-24.

System fails to boot completely

Introduction

If the system stops during the process of booting up, refer to "Bootup stages—Enhanced MMP40 (or MMP40) system" on page 16-8 to determine at which stage of the bootup the problem occurred. This will help you identify the cause of the problem.

Before you troubleshoot the bootup, verify that the problem is not with either simple cabling errors or the terminal. Check that

- PCP installation and cabling conform to the guidelines in this manual (meaning there are no loose or improperly installed cards or cables).
- There are no problems with the terminal (refer to the procedures in "Troubleshooting terminal problems" on page 16-15).

Determine stage of bootup failure

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 a hard copy of the bootup sequence as described in "Printing a hard copy of the bootup sequence" on page 16-7.

Once you have determined the stage at which the bootup stops, refer to "Troubleshooting bootup stages" on page 16-25 to find which procedure to follow.

Troubleshooting bootup stages

Stage	Procedure
1 or 2	"Troubleshooting stage 1 or 2 bootup failure" on this page.
3	"Troubleshooting stage 3 bootup failure—disk subsystem check" on page 16-26.
4	"Troubleshooting stage 4 bootup failure" on page 16-27.
5, 6, or 7	"Troubleshooting stage 5, 6, or 7 bootup failure" on page 16-27.
8	"Troubleshooting stage 8 bootup failure" on page 16-27.
9	"Troubleshooting stage 9 bootup failure" on page 16-28.
10	"Troubleshooting stage 10 bootup failure" on page 16-28.
11	"Troubleshooting stage 11 bootup failure" on page 16-29.
12	Check the SEERs output. Follow the actions suggested in the *Maintenance Messages (SEERS) Guide* (NTP 555-7001-510).

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

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...," follow these steps.

Step	Action
1	Replace the utility card.
2	Replace the Enhanced MMP40 (or MMP40) card.
3	Check for Meridian Mail power problems as described in "Preliminary action" on page 16-18, "Resolving DC system power problems" on page 16-18, "Testing the pedestal power supply" on page 16-19, "Testing the power harness" on page 16-20, and "Testing the DCEPS" on page 16-21.
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, follow these steps.

Step	Action
1	Replace the Enhanced MMP40 (or MMP40) card.
2	Check for Meridian Mail power problems.
	DC system—as described in "Preliminary action" on page 16-18, "Resolving DC system power problems" on page 16-18, "Testing the pedestal power supply" on page 16-19, "Testing the power harness" on page 16-20, and "Testing the DCEPS" on page 16-21.
	AC system—as described in "Preliminary action" on page 16-18, "Resolving AC system power problems" on page 16-22, "Testing the power harness and pedestal power supply" on page 16-22, and "Testing the CEPS" on page 16-23.
3	Replace the utility card.

Troubleshooting stage 3 bootup failure—disk subsystem check

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

Step	Action
1	Ensure that an incorrect Install tape has not been mistakenly left in the tape drive.
2	Check the SCSI device jumper settings. Refer to the tape drive and disk drive figures in Chapter 7.
3	Check the tape drive and each disk drive to ensure that the SCSI cable and power cable between the drive and the backplane connector are secure.
4	Check the voltage to disk and tape (+5 V, +12 V).
5	If on a non-prime node, replace the Enhanced MMP40 (MMP40) board.
6	Replace the disk as described in Chapter 7.

Troubleshooting stage 4 bootup failure

Failure during this stage of bootup can indicate that the system can initialize the SCSI disk but not boot from it. Follow these steps.

Step	Action
1	Perform the checks in "Troubleshooting stage 3 bootup failure—disk subsystem check" on page 16-26.
2	Check that the SCSI devices are unterminated as described in Chapter 7.
3	Check that the tape drive is unterminated as described in Chapter 7.
4	If the bootup display shows error messages such as "bus error," there may be a serious problem with the SCSI disk. Contact your Nortel Networks support organization.

Troubleshooting stage 5, 6, or 7 bootup failure

Stages 5 and 6 take up to five seconds each. Stage 7 takes up to two minutes. If the bootup fails at this point, Mail programs were read incorrectly from the disk or the program on the disk is incorrect or corrupted. Follow these steps.

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

Troubleshooting stage 8 bootup failure

To troubleshoot stage 8 bootup failure, follow these steps.

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

Troubleshooting stage 9 bootup failure

To troubleshoot stage 9 bootup failure, follow these steps.

Step	Action
1	Check the terminal output during this stage.
2	If there is indication that SEERs may be lost, power down the system and power it back up to reset the system.
3	If the system has multiple nodes and the output indicates that some of the non-prime nodes are not responding, check the power supply for those nodes. See "Preliminary action" on page 16-18 and "Testing the DCEPS" on page 16-21 (DC system) or "Testing the CEPS" on page 16-23 (AC system).
4	Power the system down, then power it back up to reset the system. If the boot still fails at the same point, replace the Enhanced MMP40 (or MMP40) cards of the affected nodes.
5	If the problem occurs on all the remote nodes, perform the system bus diagnostics ("Performing system bus diagnostics" on page 16-31).

Troubleshooting stage 10 bootup failure

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

Step	Action
1	Check the SEER output from the printer for problems with remote nodes.
2	If one or more remote nodes (but not all) are having problems, power down and up to reset the system. *Note:* If the problem is occurring on all nodes, follow "Performing system bus diagnostics" on page 16-31.
3	If the problem persists, replace the Enhanced MMP40 (or MMP40) cards of the affected nodes.

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

Step	Action
1	Check the SEERs for problems when loading programs. If you see any SEERs, then follow the actions suggested in the *Maintenance Messages (SEERs) Guide* (NTP 555-7001-510).
2	Observe the terminal output during stages 7, 8, and 9 for any indications that node 1 is not InService. If there are indications that node 1 is not InService, contact your Nortel Networks support organization.
3	If node 1 is InService but the system will not progress past stage 10, then a. Replace the Enhanced MMP40 (or MMP40) card in node 1. b. Check for Meridian Mail power problems. **DC system**—see "Preliminary action" on page 16-18, "Resolving DC system power problems" on page 16-18, "Testing the pedestal power supply" on page 16-19, "Testing the power harness" on page 16-20, and "Testing the DCEPS" on page 16-21. **AC system**—see "Preliminary action" on page 16-18, "Resolving AC system power problems" on page 16-22, "Testing the power harness and pedestal power supply" on page 16-22, and "Testing the CEPS" on page 16-23. c. If the problem is occurring on all nodes, then follow "Performing system bus diagnostics" on page 16-31.

Disk subsystem check

Checking the disk subsystem   To check the disk subsystem, follow these steps.

Step	Action
1	Power down the system.
2	Remove the suspected faulty disk drive.
3	Check that the SCSI cable and power cable between the drive and the backplane connector are secure. Refer to the tape drive and disk drive figures in Chapter 7. Refer to Chapter 18, "Hardware maintenance," for SCSI cable and power locations.
4	Check the backplane DIP switch settings. Refer to Chapter 8 for the correct backplane switch settings.
5	Replace the disk.
6	Reboot the system and perform a restore (for non-shadowed systems) as described in the *System Installation and Modification Guide* (NTP 555-7001-215) or disk sync (for shadowed systems).

System bus diagnostics

Introduction

Before you troubleshoot the bootup, verify that the problem is not with either simple cabling errors or the terminal. Check that

- PCP installation and cabling conform to the guidelines in Chapter 8 and (there are no loose or improperly installed cards or cables).

- There are no problems with the terminal (refer to the procedures in "Troubleshooting terminal problems" on page 16-15").

The Meridian Mail system bus is controlled by the utility card 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, follow the steps outlined below.

Performing system bus diagnostics

To perform system bus diagnostics, follow these steps.

Step	Action
1	Check the backplane switch settings for all modules. Refer to Chapter 8 for backplane switch settings.
2	If the utility card diagnostics were on node 1, ensure that the diagnostics passed. If they did not pass, replace the utility card.
3	Verify that the cabling between shelves is correct and secure.
4	Verify that all cards in the system are properly seated.
5	Observe the BootROM output on the node 1 terminal.
6	If the "Utility Card Check OK" message or the BTGA tests, or both, do not appear in the BootROM messages, replace the utility card.
7	If the problem persists, replace the Enhanced MMP40 (MMP40) card.
8	Power on the system.

Hardware diagnostics

Overview   A sanity check of the hardware is performed during the bootup
                        sequence. The hardware diagnostics check the following:

- volumes are present on existing nodes
- disks and required hardware are present
- all hardware passes the diagnostics

Utility card diagnostics

Overview   Utility card diagnostics are run on each utility card in the
                        system. The diagnostics check the health of the Meridian Mail
                        system bus controller, the utility card ports, and the real-time
                        clock. A utility card diagnostic failure is reported in a class 64
                        SEER. The SEER text indicates the general nature of the
                        problem. For a description of Class 64 SEERs, refer to
                        Meridian Mail Maintenance Messages (SEERs)
                        (NTP 555-7001-510).

Voice processor card diagnostics

Introduction   After the overlays are loaded on each node, voice processor
                            diagnostics are run for each VP card that is present in the node.
                            The diagnostics are run before the voice-base software is started
                            on each channel.

VP diagnostics   The VP diagnostics check each of the DSPs on the card under
                            test. If a problem is detected on the card, then a SEER is printed
                            by the diagnostics, and the DSP with the problem is marked
                            faulty. If all DSPs on the card appear faulty, the card is also
                            marked faulty. Because each DSP services two voice channels,
                            two faulty voice channels are seen on the administration voice
                            channel status screen for each faulty DSP.

                            The voice channels on a faulty DSP are not brought into service
                            as the node boots.

                            When a voice port has been marked faulty, it cannot be brought
                            into service until out-of-service diagnostics have been run on
                            the voice card and they have passed. Refer to "Channel status is
                            Faulty or OutOfService" on page 17-19.

                            The VP diagnostics issue Class 53 SEERs. The SEER text
                            indicates the general nature of the problem. For a description of
                            Class 53 SEERs, refer to *Meridian Mail Maintenance Messages
                            (SEERs)* (NTP 555-7001-510).

SCSI subsystem problems

Introduction Refer to Chapter 18, "Hardware maintenance," and Chapter 19, "Common disk subsystem problems," for SCSI troubleshooting.

Disk problems on node 1 may prevent the node from booting. Disk problems on non-prime nodes do not normally prevent the node from booting, because the operating system is loaded from the prime node. Problems with non-prime node disks or SCSI subsystems are reported through SEERs.

Chapter 17

Troubleshooting operational problems

In this chapter

Overview

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

                            To troubleshoot operational problems, refer to the following
                            table.

Symptom	See page
System-level problems	
System is running then goes down	17-4
System status remains Faulty	17-4
Meridian Mail service is unavailable	17-6
AML (ISDN/AP) link problems	
Hardware-related problems	17-7
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Administration problems	
Cannot log on remotely	17-24
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Overview

Symptom	See page
System backups (disk to tape) do not complete properly	17-25
System backups (disk to disk) do not complete properly	17-26
User-reported problems	
Recover from mailbox full…mailbox empty	17-27
Message waiting indicator does not light up on any telephone sets	17-27
Message waiting indication is delayed	17-28
Call Sender does not work for any calls	17-28
Revert DN does not work	17-29

System-level problems

**System is running
then goes down**

To diagnose why the system runs normally and then goes down for no apparent reason, follow these steps.

Step	Action
1	Check the SEER printouts.
	When the system prints more than one SEER, a combination of problems has occurred. If the system goes down as a result of a CEPS or CPU card problem, the SEERs indicate the OFS program crashing.
2	Power the system off, wait about 90 seconds, then power on again.
3	Observe the diagnostic messages that generate from BootROM on the administration terminal.
4	If you suspect that the system is experiencing a startup problem, determine which stage the startup is stopping at, follow the procedure in "Troubleshooting bootup stages" on page 16-25 corresponding to the failed startup stage.
5	If the system reboots with no hardware faults but remains out of service, refer to the SEERs to identify operational problems.

**System status
remains Faulty**

To diagnose why the administration terminal indicates that the system status is Faulty despite a successful bootup, follow these steps. If the Faulty status occurs during bootup, refer to Chapter 16, "Troubleshooting startup problems."

Step	Action
1	Check the SEER printout for related messages.
2	Take action appropriate for the SEER message as described in *Meridian Mail Maintenance Messages (SEERs)* (NTP 555-7001-510).
	a. If the SEERs indicate Digital Signal Processor (DSP) driver problems, verify that the network cable is secure. For subsequent troubleshooting, replace the network loop cable, then replace the voice processor card, or the utility card, or both.

Step	Action
3	Courtesy down the system, then reactivate it. Refer to the *System Administration Guide* (NTP 555-7001-30x) for instructions on how to courtesy down and reactivate the system.
4	Verify that the cabling from the MSDL/ESDI card to Meridian Mail is connected and secured to the correct MSDL/ESDI port.
5	Verify that the correct database programming has been used for the MSDL/ESDI dataport in Meridian Mail. Refer to Chapter 12 for details on programming and checking the ESDI/MSDL dataport.
6	Replace the following, one at a time: Enhanced MMP40 (or MMP40) card, utility cards, and any filter connectors.
7	Determine if any nodes show Faulty or OutOfService status. If any nodes are in Faulty or OutOfService status: a. Verify that all cards and disk drives are properly seated. b. Refer to "System fails to boot completely" on page 16-24. c. Check for a disk subsystem problem (Chapter 16 and Chapter 19). d. Check if Meridian Mail is communicating with SCSI address 0, 1, or 2 (Chapter 19).
8	Determine if any of the voice cards show Faulty or OutOfService status. If a voice card shows Faulty or OutOfService status: a. Disable the card. For detailed instructions on disabling the card, refer to the *System Administration Guide.* b. Perform out-of-service diagnostics as described in the *System Administration Guide* (NTP 555-7001-30x). c. Reenable the card. d. If the card fails out-of-service diagnostics or remains faulty, replace it.

Meridian Mail service is unavailable

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

Step	Action
1	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.
2	Check that the AML is up on the Meridian 1. See "AML problems" on page 17-7 for more information.
3	Verify that the primary DN in the Meridian Mail Channel Allocation Table (CAT) matches the main ACD Queue DN in the Meridian 1.
4	Make sure the VASID in the main ACD Queue DN matches the VASID in the Meridian 1 Configuration Record.
5	Verify that each service enabled on your system has the appropriate greeting and menu choices recorded.
6	Verify that each Time of Day controller, Menu Service, ThruDial, and Announcement Service has the correct service ID.
7	Check the SEERs for any operational problems.

AML problems

Introduction

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

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

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

Refer to the appropriate section for the type of error message that appears on the TTY.

Hardware-related problems

Check the status of the hardware.

- Verify that the Meridian 1 has the correct software options for the AML application.
- Examine the SEER messages.
- Examine the cable connections between the ESDI/ MSDL card and the Meridian Mail Enhanced MMP40 (or MMP40) RS-232 connector.
- Examine the bootROM messages that appear when Meridian Mail is powered on.
- Verify that the option plugs on the ESDI card are in the correct sockets; verify the switch settings on the MSDL card. See Chapter 11, "Installing the Meridian Mail to PBX interface," for details.

- If AML cabling uses the Meridian Mail and Meridian 1 input/output panels, bypass intra-cabinet cabling by connecting the AML cable directly from the ESDI/MSDL card to the J3 connector on the Meridian Mail backplane.

- Replace the ESDI/MSDL card.

- Replace the Enhanced MMP40 (or MMP40) card.

- Verify that the Meridian 1 has the correct ROM cards. See Chapter 12, "Configuring the Meridian 1," for details.

Link maintenance

Control of the AML is the responsibility of the Meridian 1. There are two main forms of AML maintenance:

- the Overlay 48 program

  This program processes maintenance or diagnostic commands, such as Enable and Disable, related to the link.

  Refer to the *SL-1 Input/Output Guide* (NTP 553-3001-400) for a complete description of Overlay 48 commands.

- link-resident maintenance program

  The maintenance program monitors and controls AML operation. The program evaluates the condition of the link and takes the appropriate action (that is, enable or disable). These actions are based on information received from the following software components:

  – ESDI/MSDL maintenance software

  – AML polling program

  – AML maintenance overlay program 48

  Once the fault has been isolated, replace the defective hardware component. Then enable the link by entering the automatic link setup command (ACMS) in Overlay 48.

Call and database recovery

Any of the following events may cause an interruption of the AML messaging:

- Meridian 1 system reload, initialization, or both

- Meridian 1 hardware input/output address conflicts (for example, two SDI, ESDI/MSDL, or D-channel cards with the same addresses)

- Meridian 1 or Meridian Mail software upgrades or conversions

- ESDI/MSDL, cable, or Local Data Set failures

- Loose cable connections

- Manual or overlay-controlled disabling of the link

- External equipment as a source of electromagnetic interference (EMI)

- Loss of commercial power

- Other critical failures

When any of these events occur, AML messages indicating a change of call status may be lost. This may result in a conflict between the Meridian 1 and Meridian Mail regarding the status of a terminal or an established call. Once the failure has been recovered, a series of AML messages are used to resolve these conflicts. This activity is controlled by Meridian Mail.

When a system reload occurs, a database discrepancy between Meridian Mail and the Meridian 1 may result in the message waiting indicator not reflecting the actual message waiting status.

AML status

The AML commands used to determine the link status or to place the link in a state will vary according to the software release of X11 and I/O card type used.

X11 Release 17 or earlier		**X11 Release 18 or later**
ENL ESDI n	use:	ENL AML n LYR2
DIS ESDI n	use:	DIS AML n LYR2
ENL CMS n	use:	ENL AML n LYR7
DIS CMS n	use:	DIS AML n LYR7
CON ESDI n	use:	EST AML n LYR2
DSC ESDI n	use:	RLS AML n LYR2
ACMS n	use:	ENL AML n ACMS
	use:	ENL AML n AUTO (MSDL)

SLFT ESDI n	use:	SLFT AML n
STAT CMS n	use:	STAT AML n
STAT ESDI n	use:	STAT AML n
SWCH CMS n n	use:	SWCH AML n n

ESDI/AML states

An ESDI/AML port may be in one of the states shown in the following table.

State	Description
Disabled	The ESDI/AML port has been disabled by the DIS ESDI/AML command.
Enabled	The ESDI/AML port has been enabled, but the link layer has not been set up by the CON ESDI/AML command. The ESDI/AML port must be in the enabled state to perform the self-test.
Connected	The ESDI/AML layer (LAPB protocol) is set up (see CON ESDI/AML command) and the port is ready to send and receive messages.
Auto Setup	The ESDI/AML is attempting to set up the LAPB layer for AML applications. This state occurs during automatic recovery of the AML or while the ACMS command is in progress.

MSDL/AML states

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

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

The messages listed in "ESDA error messages" on page 17-11 and "CSA error messages" on page 17-12 include additional information, where

n = AML number. See prompt ADAN in Overlay 17.

t = The system time.

x = The reason that the error code was issued.

Only a partial list of errors (those applicable to Meridian Mail) is included here. For a complete list of possible error

codes (including ESDI/MSDL and LNK codes), see the
SL-1 Maintenance Manual (NTP 553-2301-511).

ESDA error messages

ESDA 001 n t x	ISDN/AP 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/AP 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 startup. 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	The ISDN/AP link n link layer is connected.

n = AML number. See prompt ADAN in Overlay 17.

t = The system time.

x = The reason that the error code was issued.

CSA error messages

CSA 001 n t x   ISDN/AP ink n cannot be brought up automatically.
x = 1   The ESDI/MSDL is in an invalid state.
Actions:
1. Reseat the ESDI/MSDL card.
2. Disable and enable the ESDI/MSDL card. (DIS ESDI/MSDL and ENL ESDI MSDL commands on pre-Release 18 and DIS AML n LYR2 and ENL AML n LYR2 on Release 18 and later)
3. Replace the ESDI/MSDL.
x = 4   ESDI/MSDL failed the test.
Action: Replace the ESDI/MSDL.
x = 8   ESDI/MSDL HDLC link layer setup failed.
Actions:
1. Check the cables.
2. See the ENLC and ENLU commands.
3. Check for relevant SEERs on Meridian Mail.
x = 9   ESDI/MSDL is not responding.
Actions:
1. Check the QPC513 ESDI/MSDL switch settings.
2. Check the ESDI/MSDL cables and Meridian Mail status cable.
3. Verify that all ESDI/MSDLs have different addresses.
4. Use Overlay 48 to check the ESDI/MSDL status. See STAT ESDI/MSDL command on pre-Release 18 systems, and STAT AML n on Release 18 and later systems.
5. Disable and enable the ESDI/MSDL card. (DIS ESDI/MSDL and ENL ESDI/MSDL commands on pre-Release 18, and DIS AML n LYR2 and ENL AML n LYR2 on Release 18 and later).
6. Replace the ESDI/MSDL.
x = 10   No response from Meridian Mail to the ISDN APL polling messages.
Actions:
1. Check the SL-1 software release (should be X11 R12.31+ or greater).
2. Check the ESDI/MSDL switch settings.
3. Ensure that all SDIs have different addresses. Replace any QPC45 SDI card with a QPC513 SDI.
4. Check for relevant SEERs on Meridian Mail.
CSA 002 n t x   ISDN/AP 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/AP link n is up and active.
CSA 004 n t   ISDN/AP link n is up and standing by.

n = AML number. See prompt ADAN in Overlay 17.

t = The system time.

x = The reason that the error code was issued.

Status and diagnostic commands

Use the following commands to determine the link status. The commands are shown using the following conventions:

- The top command, shown in boldface, only applies to systems using an ESDI card and X11 software Release 17 or earlier.

- The bottom command, shown in boldface, applies to systems using either an ESDI or MSDL card and X11 software Release 18 or greater. If the command depends on the
I/O card type, the command applicable to the ESDI is shown first. The command applicable to the MSDL is shown last.

    Note: For ESDI systems (regardless of X11's software release), the variable **n** represents the ESDI port number; whereas, for MSDL systems, the variable **n** represents the MSDL port number and AML link number.

- The first line of regular text describes the function of the command for an ESDI card (X11 software Release 17 or earlier).

- The second line of regular text describes the function of the command for an ESDI card (X11 software Release 18 or later).

- The third line of regular text describes the function of the command for an MSDL card (X11 software Release 18 or later).

    Note: If the description of the command does not vary for the ESDI and MSLD card (using X11 Release 18 and greater), then the descriptions are combined.

ACMS n
ENL AML n ACMS
ENL AML n AUTO
Automatic setup of the AML using ESDI/MSDL port number n. This command is equivalent to entering the following command sequences:

- ENL ESDI n or ENL AML n LYR2
- CON ESDI n or EST AML n LYR2
- ENL CMS n or ENL AML n LYR7

Note: The ESDI/MSDL port must first be in the Disabled state.

If the first attempt to enable the link fails, the ACMS program keeps trying until setup is successful or you enter the DIS ESDI or DIS AML n LYR2 command. Every time the link setup fails, the system prints error messages.

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

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

CON ESDI n
EST AML n LYR2
Set up the Link Layer (LAPB protocol) for the AML application on ESDI/MSDL port n, which is placed in the connected state. This command is valid only if the ESDI/MSDL port is enabled. To enable the AML, the ENL CMS or ENL AML n LYR7 command must also be entered.

DIS ESDI n
DIS AML n LYR2
Disable ESDI/MSDL port number n. The link layer is disconnected and the ESDI/MSDL will not respond to far-end requests for link initialization. A warning message appears if an attempt is made to disable the active AML, but the link can be disabled if desired.

DIS CMS n
DIS AML n LYR7
Disable AML port number n. This command does not disable the actual ESDI/MSDL port, but disables application layer processing. A warning message appears when you attempt to disable the active AML, but the command is accepted.

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

DSC ESDI n
RLS AML n LYR2
Disconnect the link layer and place the port in the enabled
state. This command applies only when the port is in the
connected state.

ENL CMS n
ENL AML n LYR7
Enable AML port number n. This command is successful
only when the associated hardware components (ESDI/
MSDL port) are enabled. The ESDI/MSDL port must be in
the connected state. See CON ESDI or EST AML n and
ACMS (Release 17) or ENL AML n ACMS or ENL AML n
AUTO commands (Release 18).

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

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

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

STAT CMS
STAT AML
Display the status of all AMLs.

STAT CMS n
STAT AML n
Display the status of the AML using ESDI/MSDL port n.

STAT ESDI
STAT AML n
Display the status of all ESDI/MSDL ports.

AML troubleshooting procedures

Introduction

The procedures in this section describe how to correct problems with the link between the Meridian Mail Modular Option EC and the Meridian 1.

System status shows Faulty link to PBX

To correct this problem, follow these steps.

Step	Action
1	Verify that the AML cable is in place and secure.
2	Check that the Meridian 1 has been properly configured (refer to Chapter 12, "Configuring the Meridian 1").
3	Check other hardware addresses such as ESDI ports or D-channel ports to ensure they are not assigned the same hardware address as the MSDL/ESDI ports.
4	Verify that the MSDL switch settings or ESDI switch settings are correct, and card option plugs are installed in the correct locations.
5	Program the unassigned port of the ESDI card in the Meridian 1 configuration record and perform the self-test as outlined in Overlay 48. Refer to Chapter 12 for details. ***Note:*** The MSDL requires the self-test only. a. Disable the MSDL/ESDI port. b. Perform autosetup (ACMS) for the MSDL/ESDI port.
6	Check the PBX to make sure traffic is flowing by placing a phone call to Meridian Mail and watching the DSP Port Status screen (which you can access from the Meridian Mail Logon screen).

Testing ESDI ports (X11 Release 17 or earlier)

To test ESDI ports (X11 Release 17 or earlier), follow these steps.

Step	Action
1	Enter **ENL ESDI *n*** to enable ESDI port n.
2	Verify that the AML port is enabled, and the other port on the ESDI port is configured (with the values IADR=1 and RADR=3) and disabled.
	When the lamp on the ESDI card is lit, the card is disabled. If the display LED on the ESDI card is unlit, then at least one port is enabled.
3	Enter **SLFT ESDI *n*** to test ESDI port n.
	If the system response is other than OK, see the *SL-1 Maintenance Manual* (NTP 553-2301-511) to analyze the message.
4	Enter **DIS ESDI *n*** to disable ESDI port n.

Testing ESDI and MSDL ports (X11 Release 18 and later)

To test ESDI and MSDL ports (X11 Release 18 and later), follow these steps.

Step	Action
1	Enter **ENL AML *n* LYR2** to enable the AML n.
2	Enter **SLFT AML *n*** to test the AML n.
	If the system response is other than OK, see the *SL-1 Maintenance Manual* (NTP 553-2301-511) to analyze the message.
3	Enter **DIS AML *n* LYR2** to disable AML n.

Voice card/channel problems

**Channel status is
Faulty or
OutOfService**

If the channel status is Faulty or OutOfService, follow these steps.

Note: The term "voice card" used below refers to either a VP8 or a VP4.

Step	Action
1	Check the network loop cable connections along the network loop path between the backplane of Meridian Mail to the QPC414 in the Meridian 1.
2	Check all the jumper blocks on the backplane to make sure they are secure. See Chapter 8, "Configuring the backplane and inspecting the printed circuit packs," for further information on the placement of all jumpers.
3	Verify that the voice cards are installed in the correct nodes and are properly seated.
4	Verify the database in Meridian 1 and the Channel Allocation Table (CAT) table.
5	Check for DTA100 code on the Meridian 1 console. Refer to the *X11 Input/Output Guide* (NTP 553-3001-400) for an explanation.
6	Check the status of agents in Meridian 1 (in Overlay 32) on the Meridian 1 console. a. L S C U (L=loop, S=shelf, C=card, U=unit) b. Verify that each unit shows IDLE (log-in). c. If each unit does not show IDLE, DIS L S C U (disable loop, shelf, card, and unit) d. ENL L S C U (enable loop, shelf, card, and unit) *Note 1:* You should see message DTA101 if the agent was disabled. *Note 2:* For any error messages received during this process, refer to the *X11 Input/Output Guide* (NTP 553-3001-400) for the appropriate action.
7	Disable each voice card and perform out-of-service diagnostics on each card. See your *System Administration Guide* (NTP 555-7001-30x) for details.
8	Reenable each card. Replace the voice card, if necessary.

Step	Action
9	Check the SEER printout for any VSS load errors for that particular channel.
10	Check the SEER printout for any driver fault messages (software messages) for that channel. Refer to the *Meridian Mail Maintenance Messages (SEERs)* (NTP 555-7001-510) manual for interpretation of these SEERs and take corrective measures.
11	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.
12	Review the SEERs and take appropriate action.
13	Replace the Utility card.

Channel status remains Loading

When the channel status remains Loading, follow these steps.

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

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

Step	Action
4	Ensure that the Meridian 1 agents are enabled.
5	Ensure that the E-net or loop is enabled.

Channel status Idle but cannot be acquired

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

Step	Action
1	Check the status of the channels.
2	Check the SEER printout for messages related to that channel.
3	Take the appropriate action for that SEER.
4	Disable or 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 that the data entry for the VSDN table and Channel Allocation Table is correct. ***Note:*** If these procedures are unsuccessful, record detailed information and contact your Nortel Networks support organization.

Silent channels

Silent channel—calls have no voice and produce a SEER

When you have a silent channel where calls have no voice and produce a SEER, follow these steps.

Step	Action
1	Check the status of channels by placing a call and watching the status of the channel on the DSP Port Status screen. Load Overlay 80 and do a call trace on the TN that is under test, as outlined in the *X11 Input/Output Guide* (NTP 553-3001-400).
	If the result shows the channel being acquired, the network loop path from Meridian Mail to the Meridian 1 is correct and secure.
	If not, check the SEER printout for messages related to that channel. Then take appropriate action for that SEER.
2	Make sure that Meridian Mail has been configured with valid TNs and secondary DNs by checking the CAT table. If the TNs or DNs are incorrect for a particular card, follow steps 2a to 2d.
	TN restriction formats:

	loop is double density only
	  shelf = 0 or 1
	  card = 2 or 3
	  unit = 0 to 7

	a. Disable the card using the System Status and Maintenance function, as described in the *System Administration Guide* (NTP 555-7001-30x).
	b. Log in to the TOOLS level. Select the "Modify hardware" tool, and modify the TNs and DNs if necessary.
	c. Change the DNs in the CAT table.
	d. Perform out-of-service diagnostics, and reenable the card.
3	Ensure that each network loop is configured on the Meridian 1 by performing loop diagnostics in LD 30. Refer to the *X11 Input/Output Guide* (NTP 553-3001-400).
4	Check the voice cards: a. Disable and reseat the voice cards. b. Perform out-of-service diagnostics. c. Reenable the voice cards.

Step	Action
5	Check the QPC414 in the Meridian 1:
	a. Disable and reseat the QPC414.
	b. Reenable the QPC414.
	c. Initialize the Meridian 1.
	Note: This step will suspend call processing. Avoid it during peak business hours.
6	Replace the network loop cable.
7	Replace the voice card.
8	If these procedures are unsuccessful, contact your Nortel Networks support organization.

Silent channel—calls have no voice or SEER response

When you have a silent channel where calls have no voice or SEER response, follow these steps.

Step	Action
1	Determine if ERR 3036 or ERR 3037 appeared on the Meridian 1 console. See the *X11 Input/Output Guide* (553-3001-400) for an explanation of the error message.
2	If a new network loop was assigned for Meridian Mail in the Meridian 1 configuration record, verify that the Meridian 1 was manually initialized.
3	If these procedures are unsuccessful, contact your Nortel Networks support organization.

Administration problems

Cannot log on remotely

When you cannot log on remotely, follow these steps.

Step	Action
1	See "Troubleshooting terminal problems" on page 16-15.
2	Verify that the local administration terminal, printer, modem, and remote administration terminal are all set up correctly, according to Chapter 10.

Logon unsuccessful on operational terminal

When logon is unsuccessful on the operational terminal, follow these steps.

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

Optional feature purchased but unavailable

When an optional feature was purchased but is unavailable, follow these steps.

Step	Action
1	Verify the installed features by checking the Display system record tool (accessible from the TOOLS level).
2	If the feature is not present, attempt to add the feature from the Install/data tape as described in the chapter "Feature expansion" in your *System Installation and Modification Guide* (NTP 555-7001-215).
3	Check the SEER printout for incorrect data entries such as keycode number or serial number. If the keycode is not correct, contact your Nortel Networks support organization to obtain the correct keycode.
4	Verify that the features were ordered correctly.

Voice services submenu revert DN does not work

If the voice services submenu revert DN does not work, follow this step.

Step	Action
	By default, submenus revert to their parent menu. To revert to a specific DN:
1	Program the delayed response and initial no-response for the submenu as a calling function (CL) to the intended revert DN.

System backups (disk to tape) do not complete properly

When the disk-to-tape system backup does not complete properly, follow these steps.

Step	Action
1	Verify that you are using the correct tape for the backup. Not all tapes are appropriate for all system configurations. See the *System Administration Guide* (NTP 555-7001-30x) 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.

Step	Action
2	Examine the SEER printouts for information on where the error is occurring. Consult the *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510) for each relevant SEER and the appropriate action to take for that SEER.
3	Verify that the voltage is correct at the CEPS connectors. See "Troubleshooting terminal problems" on page 16-15.
4	Verify that all SCSI cable connections are secure.
5	Check that the tape drive is securely seated and is installed in the correct MSU slot. Refer to Chapter 7 for slot designations.
6	Replace the tape unit.
7	If the backup was unsuccessful, substitute a replacement tape drive and attempt the backup again.
	Note: Verify that the full or partial backup was successful before moving on to another task.

System backups (disk to disk) do not complete properly

When disk-to-disk system backups do not complete properly, follow these steps.

Step	Action
1	Examine SEER printouts for information on where the error is occurring. Consult the *Meridian Mail Maintenance Messages (SEERs) Guide* (NTP 555-7001-510) for each relevant SEER and the appropriate action to take for that SEER.
2	Verify that the voltage is correct at the CEPS connectors. See "Troubleshooting terminal problems" on page 16-15.
3	Verify that all SCSI cable connections are secure.
4	Ensure that the disk drive is securely seated and is installed in the correct MSU slot. Refer to Chapter 7 for slot designations.
5	If the backup was unsuccessful, substitute a replacement disk drive and attempt the backup again.
	Note: Verify that the full or partial backup was successful before moving on to another task.

User-reported problems

Introduction

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.

Recover from mailbox full…mailbox empty

To recover from the condition "mailbox full…mailbox empty," follow this step.

Step	Action
1	Run "Audit all volumes" from the TOOLS menu (see *System Administration Tools*, NTP 555-7001-305) to correct the disk space usage information.
	Note: The audit is run automatically at night, so the problem should be cleared by the next day. However, if the problem is widespread or urgent and the extra load on the system cannot be tolerated, run the audit immediately. If the problem is not widespread or urgent, run the audit during non-busy hours.
	If it is possible to keep the node out of service after it is restarted, run the audit before reenabling the node. This will prevent the recurrence of this problem.

Message waiting indicator does not light up on any telephone sets

When the message waiting indicator (MWI) does not light up on *any* telephone sets, follow these steps.

Step	Action
1	Verify that the Meridian Mail customer number on the General Options screen (under General Administration) matches the customer number on the Meridian 1.
2	If they do not match, modify the Meridian Mail customer number in the general system configuration.
3	Verify that all Meridian Mail users have Message Waiting Allowed class of service configured for their telephone sets.
4	Check the user profile in user administration for Message Notification. Refer to the *System Administration Guide* (NTP 555-7001-30x).

Message waiting indication is delayed

When the message waiting indication is delayed, follow these steps.

Step	Action
1	Verify that the CSQI and CSQO parameters controlling the message buffer size in the Meridian 1 are sufficient to handle the traffic. See Chapter 12, "Configuring the Meridian 1," for the recommended parameter values. The Meridian 1 must be initialized after changing these parameters.
2	If the parameters are insufficient, recalculate the registers.
3	Verify that the AML is up. (See "AML problems" on page 17-7 for AML troubleshooting instructions.)
4	Review the Meridian 1 history file for HDLC restarts or CSL outages that result in MWI messages being lost between Meridian Mail and the Meridian 1.
5	Increase the user's storage limit if the limit is exceeded frequently and the user is complaining of delayed messages.
6	Send a broadcast message and verify that all users receive MWI.
7	Run the Set MWI utility from the Tools level and verify that all users receive MWI.
8	If an interrupted dial tone is used for MWI notification, verify that there are sufficient digitone receiver resources on the Meridian 1.
	Meridian 1 traffic reports can be used as a tool to verify insufficient DTR resources.

Call Sender does not work for any calls

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

Step	Action
1	Verify that the Meridian Mail customer number in the "General Options" screen (under General Administration) matches the customer number on the Meridian 1.
2	If the numbers do not match, modify the Meridian Mail customer number in the general system configuration.
3	Verify that the Call Sender DN is valid and check any dialing restrictions that may apply.

Step	Action
4	Verify that the Meridian Mail ACD agents have Transfer (TRN) and Conference (A03) programmed on the correct keys (6 and 7, respectively).
5	Check the configuration against the instructions given in Chapter 12, "Configuring the Meridian 1."
6	Verify that all Meridian Mail users have a Conference (A03 or A06) key programmed for their telephone set.
7	Verify that the Meridian Mail Channel Allocation Table (CAT) was programmed correctly.
8	Verify that the Call Sender is a valid DN that can be called by the Meridian Mail agents. a. Open the user's profile. b. Move the cursor to the Personal Verification Recorded field. c. Press the [Voice] softkey. d. When the system prompts you for the DN, enter the Call Sender DN under test. e. If the call is unsuccessful, check the Meridian 1 and Meridian Mail databases for dialing restrictions.

Revert DN does not work

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

Step	Action
1	Verify that the Meridian Mail ACD agents have Transfer (TRN) programmed on key 6.
2	Check the configuration against the instructions given in Chapter 12.
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 the Custom Revert feature. Refer to the *Meridian Mail User Guide* (P0904495).

Step	Action
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 the cursor to Personal Verification Recorded field.
	c. Press the [Voice] softkey.
	d. When the system prompts you for the DN, enter the Call Sender DN under test.
	e. If the call is unsuccessful, check the Meridian 1 and Meridian Mail databases for dialing restrictions.

Chapter 18

Hardware maintenance

In this chapter

Overview

Introduction   This section provides the following maintenance procedures
                          for the Modular Option EC:

- power supply replacement
- printed circuit pack (PCP) replacement
- disk unit replacement
- enable and disable disk shadowing, and synchronize
  disks
- tape drive replacement
- tape drive maintenance

⚠ **CAUTION**
Risk of equipment damage

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

The PCPs and other components are
susceptible to static damage. Wear a
wrist strap connected to a grounding
point. This precaution protects
components against damage caused by
static electricity.

Disk units are susceptible to damage
from rough handling.

Power supply replacement

Replacing the power supply unit

To replace the power supply unit, follow these steps.

Step	Action
1	Shut off power to the Meridian Mail module using the circuit breakers (AC system) or DCEPS switches (DC system) shown in the following illustrations.
2	Pull out the CEPS or DCEPS unit to be replaced.
3	Insert the replacement unit and lock it in place.
4	Prior to turning the power back on, make sure the packs are securely locked in place and that no other components have been disturbed.
5	Turn the power back on at the circuit breakers or DCEPS switches. ***Note:*** Each CEPS provides power to half the module. The halfway point is between the two disk drives. The left CEPS powers the left half of the module, and the right CEPS powers the right side of the module.

Power division point for AC Modular Option EC
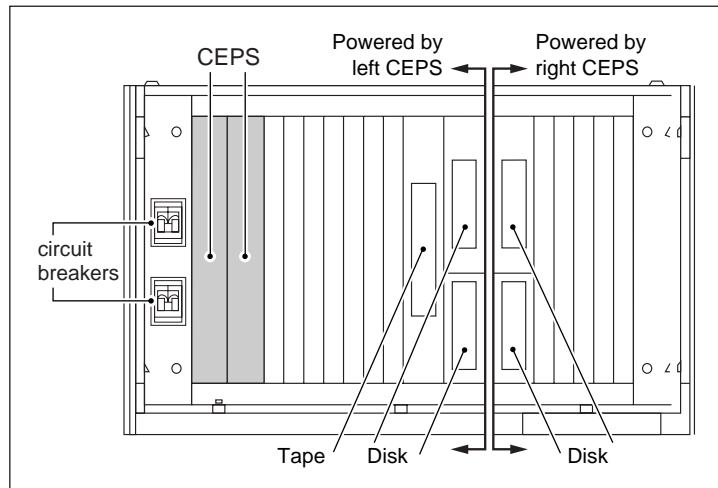
G100095

Power division point for DC Modular Option EC
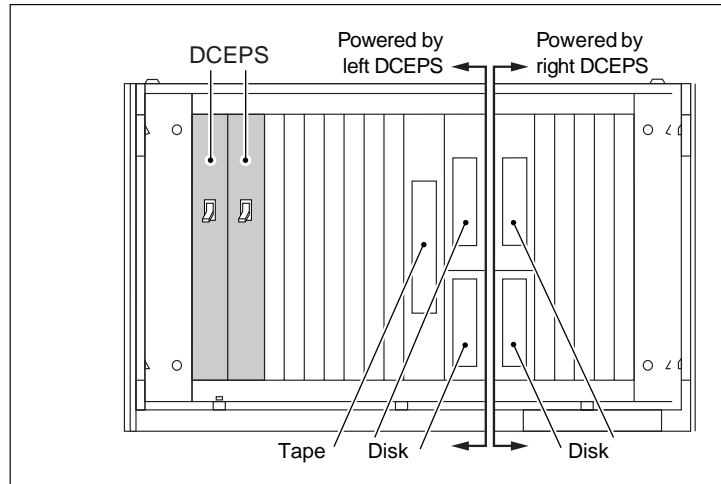
G100094

Printed circuit packs (PCPs)

Introduction

The following PCPs are used in Meridian Mail Modular Option EC:

- Enhanced MMP40 (or MMP40) card
- Utility card
- VP4 cards
- VP8 cards

Slot designations: unshadowed systems

The PCP slot designations for unshadowed systems are shown in

Slot designations: shadowed systems

Slot designations for shadowed systems are shown in

Slot allocations for unshadowed configurations

PCP slot allocations for 1-node unshadowed system

Module 0																	
		0	1	2	3	4	5	6			MSU3	MSU5	7	8	9	10	11
CEPS	BLANK	VP 4/8	VP 4/8	VP 4/8	BLANK	BLANK	UTILITY	Enhanced MMP40	TAPE		BLANK	BLANK	BLANK	BLANK	BLANK	BLANK	BLANK
										DISK		BLANK					
									MSU1	MSU2	MSU4						

Node 1, module 0

Note: Voice processor cards are populated left to right.

G100414

PCP slot allocations for 2-node unshadowed system

Module 0

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	CEPS	VP 4/8	VP 4/8	VP 4/8	BLANK	BLANK	UTILITY	Enhanced MMP40	TAPE	BLANK	BLANK	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4
											DISK					
										DISK						
									MSU1	MSU2	MSU4					

☐ Node 1, module 0   ▓ Node 2, module 0

Note: Voice processor cards are populated left to right in node 1, then left to right in node 2.

G100415

PCP slot allocations for 3-node unshadowed system

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11

Module 0

| CEPS | CEPS | VP 4/8 | VP 4/8 | VP 4/8 | VP 4 | Entopia | UTILITY | Enhanced MMP40 | TAPE | DISK power / DISK | BLANK / DISK | Enhanced MMP40 | VP 4/8 | VP 4/8 | VP 4/8 | VP 4 |

MSU1   MSU2   MSU4

Legend:
- Node 1, module 0
- Node 2, module 0
- Node 3, module 0

Note 1: Node 1 of a 3-node system has 0 ports.

Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3.

G100416

Slot allocations for unshadowed configurations

PCP slot allocations for 4-node unshadowed system

Module 1

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	BLANK	VP 4/8	VP 4/8	VP 4/8	VP 4	BLANK	Enhanced MMP40	Enhanced MMP40 / BLANK (MSU1)		BLANK / DISK (MSU2)	BLANK / BLANK (MSU4)	BLANK	BLANK	BLANK	BLANK	BLANK

Module 0

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	CEPS	VP 4/8	VP 4/8	VP 4/8	VP 4	Enhanced MMP40	UTILITY	Enhanced MMP40	TAPE (MSU1)	DISK power / DISK (MSU2)	BLANK / DISK (MSU4)	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4

Legend:
- Node 1, module 0
- Node 2, module 0
- Node 3, module 0
- Node 4, module 1
- This utility card is necessary only if additional RS-232 ports or more than 48 voice ports are required.

Note 1: Node 1 of a 4-node system has 0 ports.

Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3, then left to right in node 4.

G100417

PCP slot allocations for 5-node unshadowed system

Module 1

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	CEPS	VP 4/8	VP 4/8	VP 4/8	VP 4	BLANK	(black utility)	Enhanced MMP40	BLANK / MSU1	BLANK / DISK / MSU2	BLANK / DISK / MSU4	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4

Module 0

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	CEPS	VP 4/8	VP 4/8	VP 4/8	VP 4	Enhanced MMP40	UTILITY	Enhanced MMP40	TAPE / MSU1	DISK power / DISK / MSU2	BLANK / DISK / MSU4	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4

- Node 1, module 0
- Node 2, module 0
- Node 3, module 0
- Node 4, module 1
- Node 5, module 1

(black) This utility card is necessary only if additional RS-232 ports or more than 48 voice ports are required.

Note 1: Node 1 of a 5-node system has 0 ports.

Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3, and so on in nodes 4 and 5.

G100418

Slot allocations for shadowed configurations

Note: The shadowed disk is above the particular node's prime disk.

PCP slot allocations for 1-node shadowed system

G100419

PCP slot allocations for 2-node shadowed system

Module 0

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	CEPS	VP 4/8	VP 4/8	VP 4/8	BLANK	BLANK	UTILITY	Enhanced MMP40	TAPE	DISK power / DISK	DISK power / DISK	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4
									MSU1	MSU2	MSU4					

Node 1, module 0   Node 2, module 0

Shadowed disk with power pack

Note: Voice processor nodes are populated left to right in node 1, then left to right in node 2.

G100420

Slot allocations for shadowed configurations

PCP slot allocations for 3-node shadowed system

Module 1

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	BLANK	VP 4/8	VP 4/8	VP 4/8	VP 4	BLANK		Enhanced MMP40	BLANK	DISK power / DISK — MSU2	BLANK / BLANK — MSU4	BLANK	BLANK	BLANK	BLANK	BLANK
									MSU1							

Module 0

		0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
CEPS	CEPS	BLANK	BLANK	BLANK	BLANK	BLANK	UTILITY	Enhanced MMP40	TAPE	DISK power / DISK — MSU2	DISK power / DISK — MSU4	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4
									MSU1							

Legend:

- Node 1, module 0
- Node 2, module 0
- Node 3, module 1

This utility card is necessary only if additional RS-232 ports are required.

Shadowed disk with power pack. The shadowed disk is above the particular node's prime disk.

Note 1: Node 1 of a 3-node system has 0 ports.

Note 2: Voice processor cards are populated left to right in node 2, then left to right in node 3.
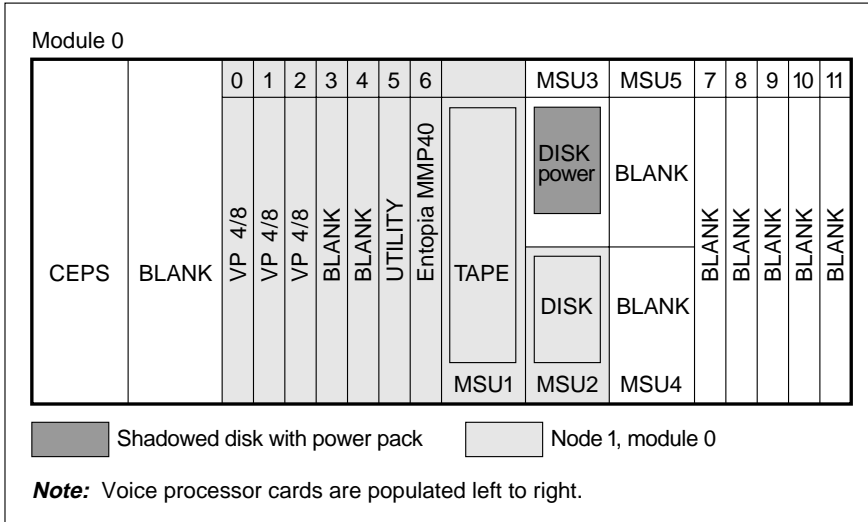
G100421

PCP slot allocations for 4-node shadowed system

Module 1

CEPS	CEPS	0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
		VP 4/8	VP 4/8	VP 4/8	VP 4	BLANK	(utility)	Enhanced MMP40	BLANK	DISK power / DISK	DISK power / DISK	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4
									MSU1	MSU2	MSU4					

Module 0

CEPS	CEPS	0	1	2	3	4	5	6		MSU3	MSU5	7	8	9	10	11
		BLANK	BLANK	BLANK	BLANK	BLANK	UTILITY	Enhanced MMP40	TAPE	DISK power / DISK	DISK power / DISK	Enhanced MMP40	VP 4/8	VP 4/8	VP 4/8	VP 4
									MSU1	MSU2	MSU4					

Legend:
- Node 1, module 0
- Node 2, module 0
- Node 3, module 1
- Node 4, module 1
- Shadowed disk with power pack. The shadowed disk is above the particular node's prime disk.
- This utility card is necessary only if additional RS-232 ports or more than 48 voice ports are required.

Note 1: Node 1 of a 4-node system has 0 ports.

Note 2: Voice processor cards are populated left to right starting with node 2, then left to right in node 3, then left to right in node 4.

G100422

Slot allocations for shadowed configurations

PCP slot allocations for 5-node shadowed system

Note 1: Node 1 of a 5-node system has 0 ports.

Note 2: Voice processor cards are populated left to right starting with node 2, then left to right in node 3, and so on in nodes 4 and 5.

G100423

PCP replacement

CAUTION
Risk of equipment damage

The circuit packs and disk drives are susceptible to static damage. Before handling circuit packs, wear an antistatic wrist strap.

Note: Only the voice processor cards are hot-pluggable. However, they must be disabled prior to removal. Use the System Status and Maintenance function from the system administration menu to disable voice cards.

Replacing a card (PCP)

To replace a PCP, follow these steps.

Step	Action
1	When you replace a voice card (VP4 or VP8), go to the Card Status screen under the System Status and Maintenance menu, and disable the card. When you replace any other type of card, courtesy down the system and power off the module.
2	Open the locking levers on the card and gently pull the card toward you until it clears the shelf.

(a)   (b)

G100044

| 3 | Check the new card to make sure it has the same PEC number as the one you removed. |
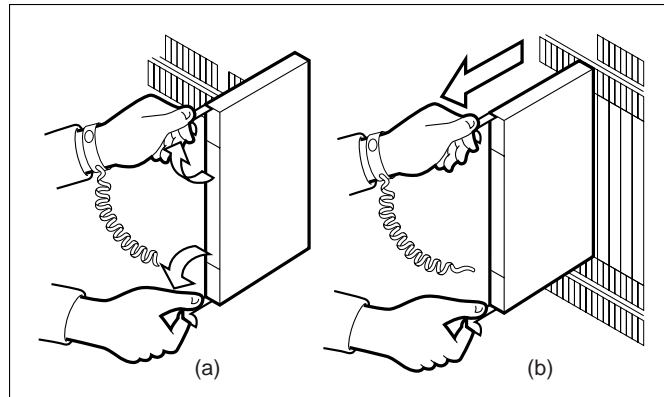
Step	Action
4	Check the new card to make sure it is not bent and that there are no loose parts. ***Note:*** If you do not install the new card immediately, keep it in an electrostatic discharge (ESD) protective container.
5	To install the new card in the module, align it with the slots in the module (the locking levers are still open). Then gently slide the card into the module.
6	Seat and lock the card: a. Use your fingers or thumbs to push on the upper and lower edges of the faceplate until the card is fully seated in the module. b. Close the locking levers.

Disk unit replacement

Introduction   The mass storage units that are supported in Meridian Mail
Release 11 for the Modular Option EC system are listed in
Chapter 7, "Installing the disk drives and tape drive."

DANGER
Risk of electrical shock

Power off the Meridian Mail module
before removing and replacing the disk
unit.

CAUTION
Risk of equipment damage

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

Disk unit replacement—unshadowed system

Replacing a disk in an unshadowed system

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

Step	Action
1	Loosen the screw on the faceplate that covers the disk drive and tape drive area, and slide the faceplate up and out.
2	Verify that the disk drive has the same PEC, including suffix, as shown on the packing slip.
3	Verify that the SCSI IDs are set to 0. To do this, check that all the SCSI address jumpers on the jumper pins have been removed. Refer to the disk drive illustrations in Chapter 7. (You may need to remove the brackets holding the disk drive.) ***Note:*** The disk units are labeled to show the node number for which they are configured. Be sure to check the number and install the disk into the correct node.
4	Verify that all other settings (for example, parity) are correct. Refer to the disk drive illustrations in Chapter 7.
5	Open the locking levers and align the card with the appropriate MSU slot in the module (refer to the illustrations in "Slot allocations for unshadowed configurations" on page 18-6 for disk slot locations within the node).
6	Gently slide the card into the module. Push on the upper and lower edges until the disk drive is fully seated in the module.
7	Close the locking levers.
8	Replace the faceplate.

Step	Action
9	Is the replacement disk drive of equal or greater capacity?

IF	THEN
equal capacity	perform a restore from backup.
	See Chapter 6, "Restore system from backup," in the *System Installation and Modification Guide* (NTP 555-7001-215).
greater capacity	perform a restore from backup and then run the Hardware modify.
	See Chapter 3, "Comprehensive upgrade," in the *System Installation and Modification Guide* (NTP 555-7001-215).

Disk unit replacement—shadowed system

Introduction
Disk shadowing is available for Modular Option EC systems. Dissimilar disk drives can be used in the same node provided the smaller sized disk (that is, the primary disk) has its SCSI address set to 0.

Disk shadowing
Disk shadowing is a process in which the data from one disk is recorded to a second disk to provide protection against loss of data in the event a disk failure occurs. Shadowing involves multiple write and alternate read operations. When a disk error occurs on one disk, the system generates a SEER and ignores that disk drive; it continues to work with the other disk drive. In this way, service is not interrupted when the disk goes down. At the scheduled maintenance time, the node is brought down and the disk drive is replaced. Hot-pluggable disk drives are not supported.

Disk replacement
Disk replacements on an active system should be performed only on those nodes listed in the table below.

Note: Nodes not listed in the table contain EVB termination. To replace the disk while the system is active will cause an entire system outage if the node is powered down.

Disk replacements allowed on an active system

Number of nodes in the shadowed system	Nodes on which the disk can be powered down and reseated while the system is active
2-node system	node 2
3-node system	node 2 (if there is only one utility card)
4-node system	nodes 2 and 4 (2, 3, and 4 if there is only one utility card)
5-node system	nodes 2, 3, and 4

Slot locations: shadowed disks
If you have a shadowed system, the SCSI ID is 0 for the primary disk and 2 for the secondary disk. The disk drive

illustrations in Chapter 7 show the location of the jumpers and SCSI ID settings for the different disk drive models. The slot locations of shadowed disks are shown in:

- "PCP slot allocations for 1-node shadowed system" on page 18-11
- "PCP slot allocations for 2-node shadowed system" on page 18-12
- "PCP slot allocations for 3-node shadowed system" on page 18-13
- "PCP slot allocations for 4-node shadowed system" on page 18-14
- "PCP slot allocations for 5-node shadowed system" on page 18-15

Note: The shadowed disk in a shadowed system has an auxiliary power supply.

Removing and replacing the disk unit in a shadowed system

Note: Verify that you have the *System Administration Guide* (NTP 555-7001-30x) on hand when performing the procedures that follow.

Replacing the primary disk

To replace the primary disk in a shadowed system, follow these steps.

Step	Action
1	Disable disk shadowing.
2	Courtesy down the system.
3	Power down the system.
4	Verify the new prime disk drive has the same part number, including suffix, as shown on the packing slip.
5	Address the new primary disk as SCSI ID=0.
6	Install the primary disk in the prime disk location (the same MSU slot as the disk you are replacing).
7	Reboot the system.
8	Synchronize the disks. Refer to "Enabling or disabling disk shadowing" on page 18-27.

Step	Action
9	Is the replacement disk drive of equal or greater capacity?

IF the replacement disk drive is of	THEN
equal capacity	perform a restore from backup. See Chapter 6, "Restore system from backup," in the *System Installation and Modification Guide* (NTP 555-7001-215).
greater capacity	perform a restore from backup, and then run the Hardware modify. See Chapter 3, "Comprehensive upgrade," in the *System Installation and Modification Guide* (NTP 555-7001-215).

Replacing the secondary disk

To replace the secondary disk in a shadowed system, follow these steps.

Step	Action
1	Disable disk shadowing.
2	Courtesy down the system.
3	Power down the system.
4	Replace the disk drive.

   a. Loosen the screw on the faceplate covering the disk drive, and slide it up and out.
   b. Verify that the new disk drive has the same part number, including suffix, as shown on the packing slip.
   c. Ensure that the SCSI IDs are correct.
      Note: For a shadowed system, the SCSI ID on the secondary disk is 2.

Step	Action

d. Ensure that all other settings (for example, parity) are correct. Refer to the disk drive illustrations in Chapter 7.

   Note: Verify that the backplane switches are set to shadowing configuration. Refer to Chapter 8, "Configuring the backplane and inspecting the printed circuit packs," for the correct switch settings.

e. Open the locking levers and align the new disk drive with the appropriate MSU slot in the module. Refer to

   "PCP slot allocations for 1-node shadowed system" on page 18-11

   "PCP slot allocations for 2-node shadowed system" on page 18-12

   "PCP slot allocations for 3-node shadowed system" on page 18-13

   "PCP slot allocations for 4-node shadowed system" on page 18-14

   "PCP slot allocations for 5-node shadowed system" on page 18-15

f. Gently slide the new disk drive into the same slot where the old secondary disk drive was. Push on the upper and lower edges until the disk drive is fully seated in the module.

g. Close the locking levers.

h. Replace the faceplate.

Step	Action
5	Is the replacement disk drive of equal or greater capacity?

IF the replacement disk drive is of	THEN
equal capacity	perform a restore from backup. See Chapter 6, "Restore system from backup," in the *System Installation and Modification Guide* (NTP 555-7001-215).
greater capacity	perform a restore from backup, and then run the Hardware modify. See Chapter 3, "Comprehensive upgrade," in the *System Installation and Modification Guide* (NTP 555-7001-215).

Step	Action
6	Reboot the system (if you have not already done so).
7	Enable disk shadowing.

Upgrade unshadowed systems to shadowed systems

A 4-node shadowed system can be installed in two modules. A five-node shadowed system can be installed in three modules.

When you install a 3-, 4-, or 5-node unshadowed system, and plan to expand to its equivalent shadowed system in the future, install the initial hardware configuration as if it were a shadowed system (that is, card placement, cabling, and backplane switch settings). Since this is an unshadowed system, the second disk unit is not installed.

At the time that expansion to a shadowed system is performed, install the secondary disk (in a shadowed system the disk unit also contains an auxiliary power unit) in the system.

The NT PEC codes for the different disk/power units are as follows:

–   300 Mbyte   NT6P43AA
–   1.0 Gbyte   NT6P44AA
–   2.0 Gbyte   NT6P44BA
–   4.5 Gbyte   NTNTDK74AB

Enable or disable disk shadowing

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

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

Step	Action
1	Log on at the administration terminal.
2	To select System Status and Maintenance, enter the number corresponding to the item and press Return. The System Status and Maintenance screen appears.

```
                    System Status and Maintenance


             1    System Status

             2    Card Status

             3    DSP Port Status

             4    Channel Allocation Table

             5    System Event and Error Reports

          *  6    Disk Maintenance



  Select an item >

     Exit                                  Silence
                                            Alarm
```
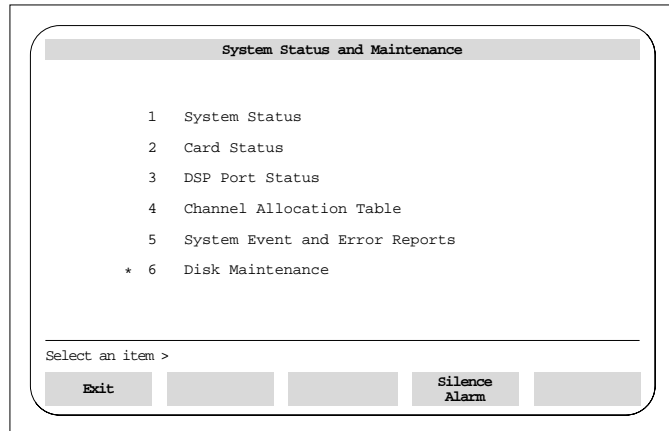
G101079

Step   Action

3   To select Disk Maintenance, enter the number corresponding to
        the item and press Return.

        The Disk Maintenance screen appears.
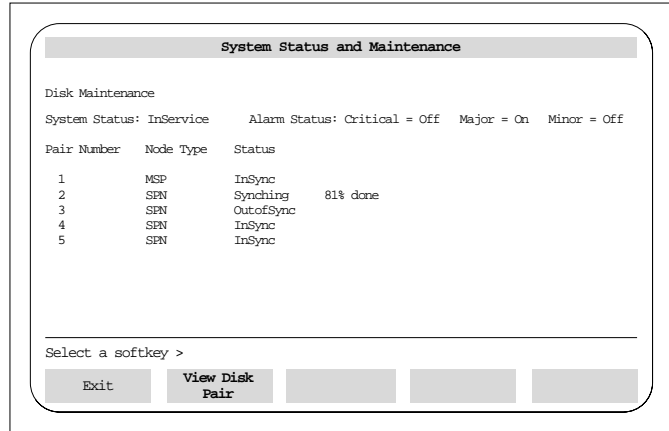
```
┌──────────────────────────────────────────────────────────────┐
│  ╭──────────────────────────────────────────────────────────╮ │
│  │            System Status and Maintenance                 │ │
│  │                                                          │ │
│  │  Disk Maintenance                                        │ │
│  │  System Status: InService    Alarm Status: Critical = Off   Major = On   Minor = Off │ │
│  │  Pair Number   Node Type    Status                       │ │
│  │    1           MSP          InSync                       │ │
│  │    2           SPN          Synching    81% done         │ │
│  │    3           SPN          OutofSync                    │ │
│  │    4           SPN          InSync                       │ │
│  │    5           SPN          InSync                       │ │
│  │                                                          │ │
│  │  ──────────────────────────────────────────────────     │ │
│  │  Select a softkey >                                      │ │
│  │  ┌────────┬──────────┬────────┬────────┬────────┐        │ │
│  │  │  Exit  │View Disk │        │        │        │        │ │
│  │  │        │   Pair   │        │        │        │        │ │
│  │  └────────┴──────────┴────────┴────────┴────────┘        │ │
│  ╰──────────────────────────────────────────────────────────╯ │
│                                                     G101080    │
└──────────────────────────────────────────────────────────────┘
```

4   Press the [View Disk Pair] softkey.

        You are prompted for the disk pair number.

5   Enter the appropriate number.

        The Disk Pair Status screen appears.
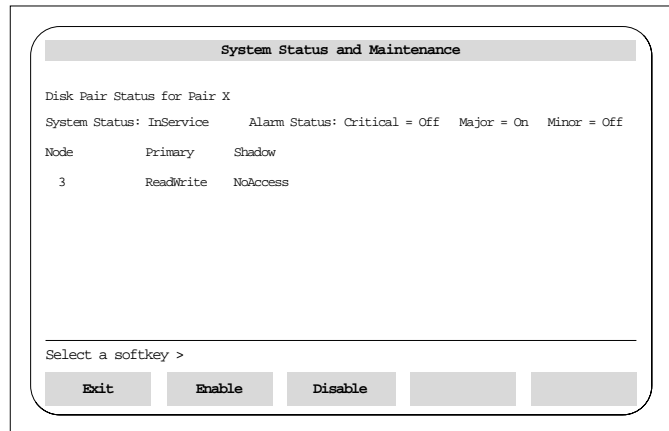
```
┌──────────────────────────────────────────────────────────────┐
│  ╭──────────────────────────────────────────────────────────╮ │
│  │            System Status and Maintenance                 │ │
│  │                                                          │ │
│  │  Disk Pair Status for Pair X                             │ │
│  │  System Status: InService    Alarm Status: Critical = Off   Major = On   Minor = Off │ │
│  │  Node        Primary    Shadow                           │ │
│  │    3         ReadWrite   NoAccess                        │ │
│  │                                                          │ │
│  │  ──────────────────────────────────────────────────     │ │
│  │  Select a softkey >                                      │ │
│  │  ┌────────┬──────────┬────────┬────────┬────────┐        │ │
│  │  │  Exit  │ Enable   │Disable │        │        │        │ │
│  │  └────────┴──────────┴────────┴────────┴────────┘        │ │
│  ╰──────────────────────────────────────────────────────────╯ │
│                                                     G101081    │
└──────────────────────────────────────────────────────────────┘
```

6   Press the [Enable] softkey.

        The system determines the source of the sync by choosing the
        disk that is in ReadWrite mode.

Tape drive replacement

Introduction

The tape drive should be replaced when you receive repeated errors when you write to tape, and the problem cannot be fixed by cleaning the tape heads and using a new tape.

Also, replace the tape drive if the light on the front of the tape drive is out, or if you cannot hear the tape spinning during backup or restore.

> ⚠ **CAUTION**
> **Risk of equipment damage**
>
> Use great care when you install the tape drive. It is extremely susceptible to damage from rough or improper handling.

> ⚡ **DANGER**
> **Risk of electrical shock**
>
> Power down the Meridian Mail system before you remove and replace the tape drive.

Replacing the tape drive

To replace the tape drive, follow these steps.

Step	Action
1	Power off the Meridian Mail system.
2	Unlatch the tape drive unit and slide it out of the module casing.
3	Configure the jumpers on the replacement unit as shown in "Archive tape drive connectors and jumper settings" on page 18-30, "Tandberg tape drive and jumper settings" on page 18-30, or "Tandberg tape drive connectors (front view)" on page 18-31.
4	Install the new unit in the module and close the locking levers.

Archive tape drive connectors and jumper settings

Power connector   Pin 1   Terminating resistors removed

Buffer disconnect
Size (16K)

Operation   SCSI ID
mode   =1   PWA

Jumper   PWA   Pin 1   SCSI
block   connector

ID 2
ID 1
ID 0

G100025

Tandberg tape drive and jumper settings

Terminating resistors removed

Tpwr

Select 0   SCSI ID= 1
        1
        2
                             Parity

                             In
                             Out

Test
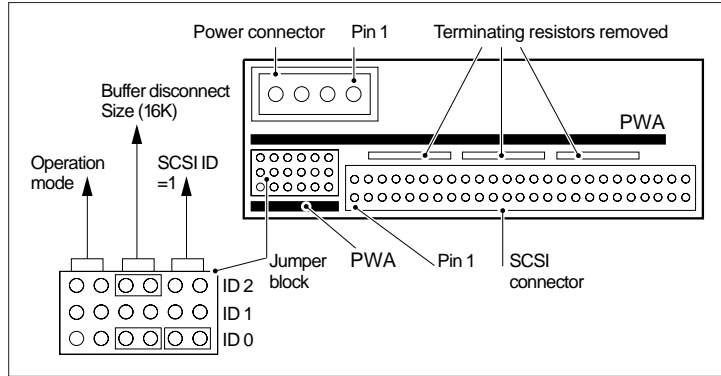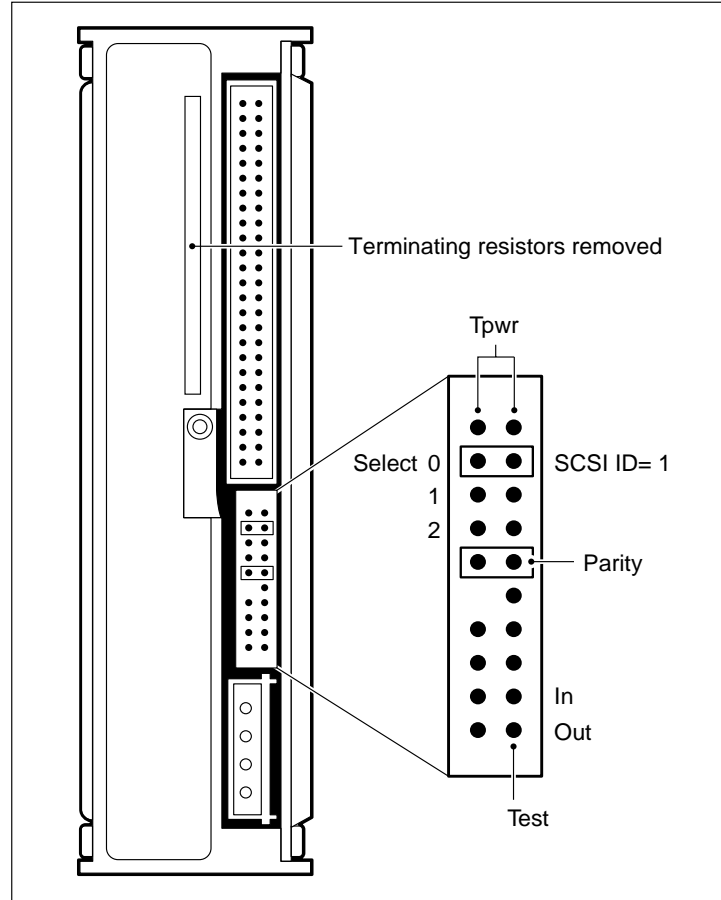
G100016

Tandberg tape drive connectors (front view)
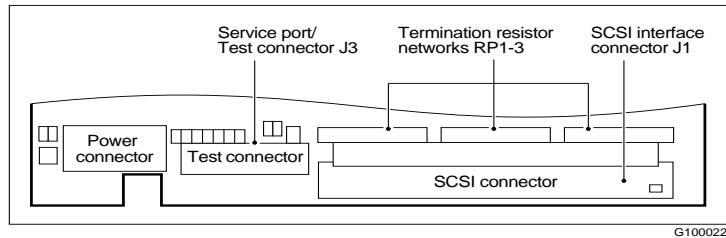
Note: Terminator resistors are removed.

Tape drive maintenance

Introduction Preventive maintenance of the tape drive involves periodic cleaning (after every four to six hours of use). 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 you use and store 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 reach room temperature slowly before using it.

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

The tape drive should be replaced when you receive repeated errors when you write to tape. Also, replace the tape drive if the light on the front of the tape drive is out or you cannot hear or see the tape spinning.

Cleaning the tape drive Clean the tape cartridge cavity

- 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 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, 15cm (six inches) or longer

Note: If you have a Tandberg tape drive, do not use the cleaning procedures for Archive tape drives.

The tape drive cleaning kits are listed in the following table:

Tape drive cleaning kits

Tape drive	Cleaning kit CPC code
Archive Viper	A0378220
Tandberg TDC 4220-8962	A0633585

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 "Cleaning the Tandberg tape drive" on page 18-36.

Step	Action
1	If there is a tape cartridge in the tape drive, remove the cartridge.
2	Push the head-loading lever down into the load position.
3	Carefully blow 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 as described in the table above.
6	Moisten the flexible pad of the cleaning cartridge with four drops of the Streaming Tape Head Cleaning Fluid.
7	Insert the cleaning cartridge into the tape drive in the same way as a normal tape cartridge, and lock it into position.
8	Move the moistened pad using four strokes of the guide rod. Move the rod as far as it will go each time.
9	Remove the cleaning cartridge from the tape drive.
10	Remove and discard the moist pad, and replace it with a dry pad.

Step	Action
11	Insert the cleaning cartridge into the tape drive, and lock it into place.
12	Move the dry pad using four strokes of the guide rod. Move the rod as far as it will go each time.
13	Remove the cleaning cartridge. Store it with the dry pad in its original carton until the next use.

Cleaning the Archive tape drive with swabs and fluid

Use this procedure only if you have an Archive tape drive. If you have a Tandberg tape drive, refer to "Cleaning the Tandberg tape drive" on page 18-36.

Step	Action
1	If there is a tape cartridge in the tape drive, remove the cartridge.
2	Push the head-loading lever down into the load position.
3	Carefully blow dust from the sensor hole and tape cartridge cavity with aerosol air. (Refer to "Archive tape drive cleaning" on page 18-35.)
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.

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

Step	Action

Archive tape drive cleaning

Sensor holes   Tape head

Cotton swab
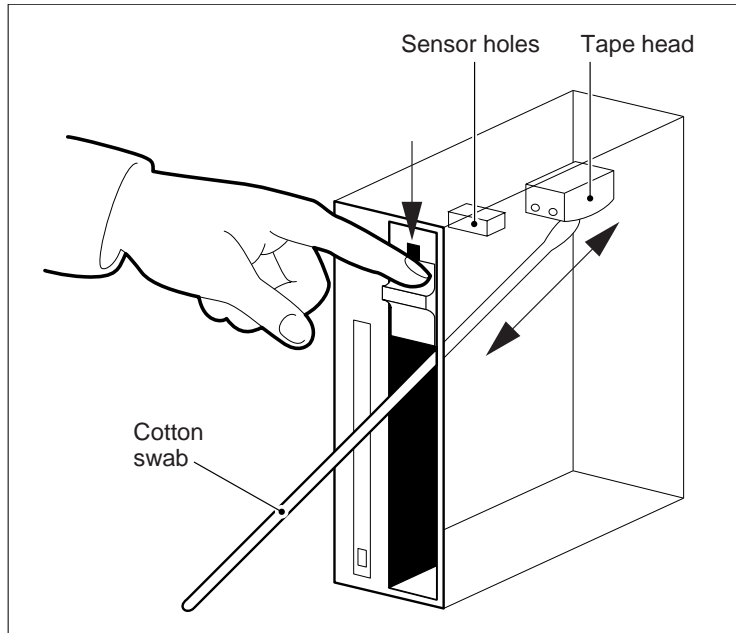
G100003

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.

Cleaning the Tandberg tape drive

Follow the steps in this procedure if you are cleaning the Tandberg tape drive. If you have an Archive tape drive, refer to "Cleaning the Archive tape drive with the cleaning kit" on page 18-33, or "Cleaning the Archive tape drive with swabs and fluid" on page 18-34.

Step	Action
1	Press the release button on the tape drive (see the following illustration).

The tape drive door opens.
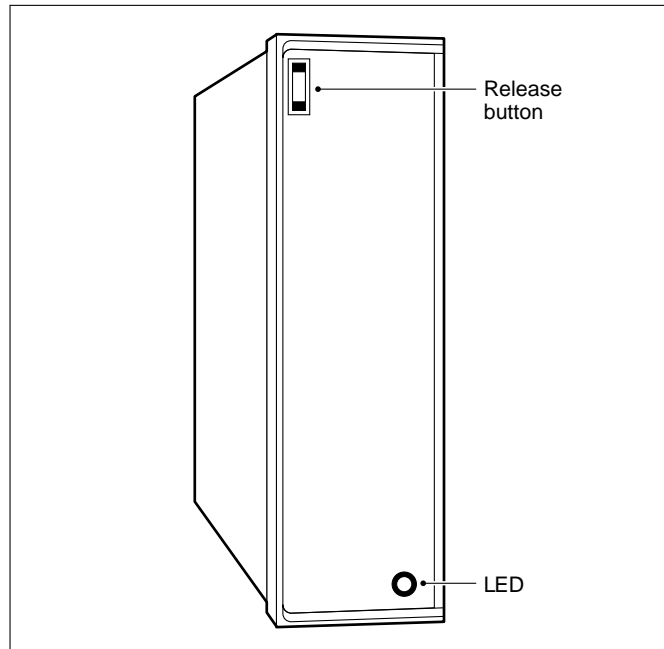
G100002

Step	Action
2	If there is a tape cartridge in the tape drive, remove it.
3	Prepare the cleaning cartridge as per the manufacturer's instructions.
4	Carefully blow 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.

Step	Action
7	After a suitable period (that is, several minutes), press the release button to disengage the cartridge.
	The door opens and the tape drive stops running.
8	Remove the cartridge and store it in its original container.
	Store the cleaning cartridge in its original container and put it away until its next use.
9	Wait a couple of minutes for the tape heads to dry before using the tape drive.

Chapter 19

Common disk subsystem problems

In this chapter

Overview

Introduction   When disk subsystem problems are suspected, check the following:

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

Device jumpers   Jumpers are used to set the SCSI ID, as well as other options on the disk and tape drives. The actual settings on these devices should be checked against the figures and descriptions in Chapter 7.

Bus termination   Termination resistors are not allowed on any SCSI device.

Power   Disk and tape drives are fed by one or more DC power converters. The drives may behave erratically when there are problems with the power supply. Verify that the relevant power supplies are properly installed and that the LEDs on their front panels remain solidly lit. Refer to Chapter 6, "Installing power supplies."

SCSI bus sanity tests   Perform a quick sanity check of the SCSI bus by testing tape and disk drives as follows:

Tape drive sanity test
To conduct a sanity test on a tape drive, follow these steps.

Step	Action
1	Put a tape in the tape drive.
2	Power on the left side of the module. The tape drive should make a series of clicking noises as it tries to load the tape.

Disk drive sanity test

To conduct a sanity test on a disk drive, follow this step.

Step	Action
1	Power on both sides of the module that contains the tape drive.
	As power is applied, the LED on each disk drive should come on briefly and go off. It should not remain lit.

Disk problems identified by SEERs

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

Disk problem   A SEER in the form "6603/6605 Disk #> sense key: # error
                       code: # [block: #]" is produced when a disk reports a problem.
                       The sense key describes the general nature of the problem and is
                       not drive- or manufacturer-dependent. The error code describes
                       the exact problem but is often drive-dependent. There may be an
                       optional disk block number associated with the problem report.

Sense keys   *Sense key 2* indicates that the disk is not ready to accept
                       commands. One possible cause is that the drive is not spinning
                       up. If this appears during regular operation, the disk should be
                       replaced.

                       Sense key 3 normally indicates a medium error. Disk controller
                       problems can also cause this sense key to appear. A block
                       number is provided with this problem report. Use the "scsi_util"
                       verify command to check that the block is indeed bad (a bad
                       block will cause an error message). If it is bad, reassign it. If no
                       bad block is found, replace the disk.

                       Sense key 4 indicates a disk hardware failure. Replace the disk
                       drive.

                       Sense key 5 indicates an invalid command was sent to the drive.
                       If this appears during regular operation, replace the disk drive
                       and contact Nortel Networks support.

                       Sense key 6 indicates the SCSI bus has been reset. If this
                       appears during regular operation, contact Nortel Networks
                       support.

Communication   A SEER in the form "6604/6606 Disk #> driver error # " is
problem   produced when there is a problem communicating with a disk.

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

- Verify that the disk drive is properly seated.
- Check the jumpers on the disk drive. See Chapter 7 for details.
- Verify that the SCSI cable and power cable from the disk drive to the drive plate connectors are each firmly attached at both ends.

Data loss and disk replacement

Introduction   When a disk fails and needs to be replaced, the following backups can limit data loss:

- A tape backup may have been performed prior to the failure.
- A tape backup can often be made after the failure.

Tape backups   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**
>
> Never back up over an existing good backup, as the data on the disk may now be corrupted, and you may destroy useful information.

The backup utility attempts to run to completion in spite of disk errors. It is likely that the contents of a number of disk blocks are unrecoverable.

The loss of a small number of blocks may result in minor operational problems for Meridian Mail, such as corruption of some messages or mailboxes. However, damage to critical areas can cause a system malfunction.

Replace the disk and restore the backup made after failure onto the new disk. If the system malfunctions afterwards, restore the data from the most recent backup made before the disk failure.

Appendix A

Terminal configuration

In this appendix

Overview

Introduction   Several different models of administration terminal can be used
with Meridian Mail. This appendix shows how to configure
each terminal for proper data communications with Meridian
Mail. Chapter 10, "Installing, cabling, and configuring
peripheral devices," shows how to cable these terminals to the
printer and to the A/B switchbox.

Baud rate   Releases 10 through 13 of Meridian Mail allow baud rates to be
set to 2400 or 9600 bps, depending on the type of modem and
the baud rate selected for your particular configuration.
Whichever baud rate is selected, the terminal configuration
must match the baud rate set for the modems. See Appendix B,
"Modem configurations."

You configure a terminal by entering the setup mode.

> **CAUTION**
> **Risk of data loss**
>
> While you can enter setup mode at any
> time, do so only while you are logged off
> Meridian Mail.

Terminal setup   There are three types of fields in terminal setup screens: action,
read-only, and parameter entry or selection. Most of the fields
on the screens, and almost all the fields you need to use for
setup, are parameter entry or selection fields.

Action fields are indicated by underscores in the figures
illustrating setup screens. Action fields cause an action to take
place, such as clearing the display. Unless instructed otherwise,
you do not need to use action fields.

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

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

Configuring an HP700/32 terminal

Configuring an HP700/32 terminal

To configure an HP700-32 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located on the top row of function keys. If no key is marked SETUP, press the third key from the left in the top row.
	The Global Set-Up screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the contents of the setup screens on your terminal. This is because of 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 "HP700/32 setup screens" on page A-4.
	Use the following keys to view and change setup values:
	Up and down arrow keys — Move from field to field.
	Left and right arrow keys — Scroll through possible values for a parameter. The values are displayed in a window at the bottom of the screen.
	Return — Cause the requested action to take place in an action field.
	<NextScreen> — Move to the next setup screen.
	<PrevScreen> — Move to the previous setup screen.
4	To save changes, press <F6-Save> on *each screen* where you made changes.
5	To exit setup mode, press the SETUP key.

HP700/32 setup screens

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Host Port	1
Background	Dark
Screen Saver	10 Min
Refresh Rate	72 Hz
Key Click	Yes
Keyboard	U.S.
Message Translations	English
Setup Translations	English
Clear Display	
Clear Comm	
ROM Revision	C1017-80004-2948

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

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

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HP700/32 setup screens (continued)

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Emulation	VT320
Terminal Id	VT220
Control Codes	7-Bit
Characters Mode	8-Bit
Preferred Char Set	DEC Supplemental
Keypad Mode	Application
Curser Keys	Normal
Print Scroll Region	Off
User Features Locked	No
User Keys Locked	No
Data Processing Keys	No

GLOBAL	USER	EMULATION	PORT 1	PORT 2	KEYBRD	PROGRAM

Communication	Full Duplex	CD	Ignore
Data Length	8-Bits	Break Duration	170ms
Parity	None	Disconnect Delay	Never
Stop Bits	1	Aux Printer Type	National
Xmit Baud	9600		
Recv Baud	=Xmit		
Xmit Pace	Xon/Xoff		
Recv Pace	Xoff at 128		
Limited Transmit	Off		
DSRI	No		
CTS	Ignore		

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HP700/32 setup screens (continued)

| GLOBAL | USER | EMULATION | PORT 1 | PORT 2 | KEYBRD | PROGRAM |

Communication   Full Duplex
Data Length   8-Bits
Parity   None
Stop Bits   1
Xmit Baud   9600
Recv Baud   =Xmit
Xmit Pace   DSR/Xon/Xoff
Recv Pace   Xoff at 128
Limited Transmit   Off
Break Duration   170ms
Aux Printer Type   National

| GLOBAL | USER | EMULATION | PORT 1 | PORT 2 | KEYBRD | PROGRAM |

Lock Key   Caps Lock   Tab setting
Kbd Lock Enable   Yes
Save Tabs   Yes
Auto Repeat   Yes
Margin Bell   Yes
Warning Bell   Yes
Auto AnswerBack   Yes
Answerback =
Conceal Answerback   No
Clear all Tabs
Set 8 Column Tabs

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Configuring a VT420 terminal

Configuring a VT420 terminal   To configure a VT420 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located in the top row of function keys. If no key is marked SETUP, press the third key from the left in 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 because of 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 "VT420 setup screens" on page A-8.
	Use the following keys to view and change setup values:
	Arrow keys — Move from field to field.
	Return — Scroll through possible values or cause the requested action to take place (depends on the type of field).
	To move to another setup screen, select a screen from the top line of the Setup Directory screen and press Return. To move to the next setup screen, select To Next Set-Up on any other setup screen.
4	To save changes, return to the Setup Directory screen, move the cursor to the Save field, and press Return.
5	To exit setup mode, press the SETUP key.

Note: If your system has been upgraded to Meridian Mail Release 11, and the VT420 screen does not clear, change the Sessions on COMM1 value in the Global Setup screen (see the illustration on page A-8) to S1=COMM1 to avoid having to redraw the screen.

VT420 setup screens

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

```
Global Set-Up
To Next Set-Up    To Directory
0n Line    Sessions on Comm1    CRT Saver
Comm1=RS-232    70Hz    Printer shared
```

```
Display Set-Up
To Next Set-Up    To Directory    80 Columns    Interpret Controls
Auto Wrap    Jump Scroll    Dark Screen
Cursor    Block Style Cursor    Indicator Status Display
Cursor Steady    6x24 pages    24 Lines/Screen
Vertical Coupling    Page Coupling    Auto Resize Screen
```

```
General Set-Up
To Next Set-Up    To Directory    VT400 Mode,    7 Bit Controls
User Defined Keys Unlocked    User Features Unlocked    8-bit Characters
Application Keypad    Normal Cursor Keys    No New Line
UPSS DEC Supplemental    VT220 ID
When Available Update
```

```
Communications Set-Up
To Next Set-Up    To Directory    Transmit=9600    Receive=Transmit
Xoff @ 64    8 Bits, No Parity    1 Stop Bit    No Local Echo
Data Leads Only    Disconnect, 2 s Delay    Limited Transmit
No Auto Answerback    Answerback =                Not Concealed
Modem High Speed = ignore    Modem Low Speed = ignore
```

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

```
Keyboard Set-Up
To Next Set-Up    To Directory    Typewriter Keys    Caps Lock
Auto Repeat    Keyclick High    Margin Bell Off    Warning Bell High
Character Mode    <X]    Delete    Local Compose    Ignore Alt
F1 = Hold    F2 = Print    F3 = Set-Up    F4 = Session    F5 = Break
, < and . > Keys            < > Key            '~ Key
```

G101090

Configuring a VT520 terminal

Configure a VT520 terminal   To configure a VT520 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located in the top row of function keys. If no key is marked SETUP, press the third key from the left in the top row.

The Main Set-Up window is displayed.

```
        Actions              ▷
        Session              ▷
        Display              ▷
        Terminal type        ▷
        ASCII emulation      ▷
        Keyboard             ▷
        Communication        ▷
        Modem                ▷
        Printer              ▷
        Tabs...
        Set-Up language      ▷

   ▢   On-line
        Save settings
        Restore settings
        Exit Set-Up
```

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Step	Action
3	Use the up and down arrow keys to highlight the setup feature that is to change (for example, Actions).
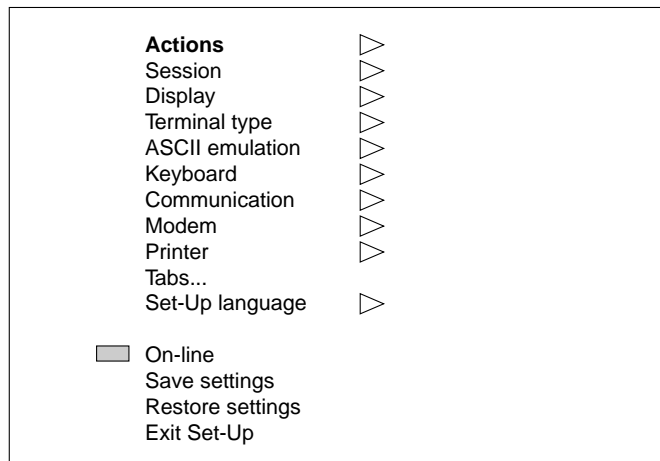
Step	Action
4	When the setup feature is highlighted, use one of the following methods to select the appropriate settings:

IF	THEN
a solid triangle appears beside the setup feature	use the right arrow key to automatically display the pop-up window of associated settings. See the following illustration for an example.
a box appears beside the setup feature	press Enter to toggle the setting for the selected feature on or off. A diagonal line appears in the box when the setting is on.
three dots (. . .) appear beside the setup feature	press Enter to display the associated pop-up window. When all fields have been completed, move the cursor to [OK] or [Cancel], and press Enter again to activate your choice.

```
   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              │
```
G101092
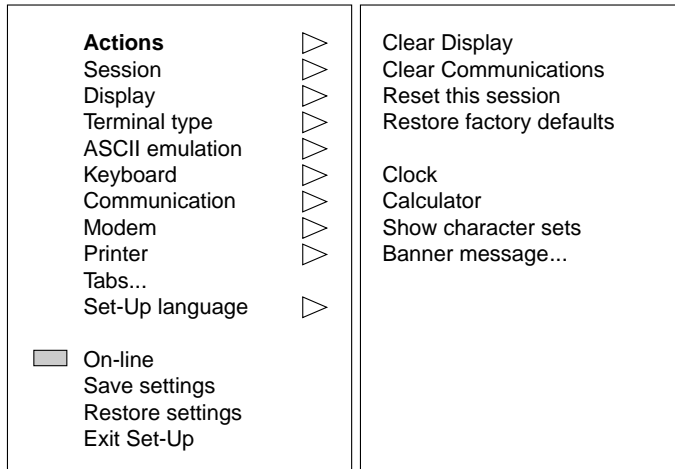
Step	Action
5	Configure the terminal to match the mandatory settings in "VT520 setup values" on page A-11. If no setting is specified, select the parameter that best suits your environment.
6	Press SETUP again to exit setup mode.

VT520 setup values

Setup feature	First level	Mandatory setting or description
Actions	Clear display	Press Enter to clear the display.
	Clear communications	Press Enter to clear communications.
	Reset this session	Press Enter to reset this session.
	Restore factory defaults	Press Enter to restore the factory default.
	Clock	Press Enter to set the VT520 clock.
	Calculator	Press Enter to use the VT520 calculator.
	Show character sets	Press Enter to display character sets.
	Banner message . . .	Press Enter to set the banner message.
Session	Select session	Select Session 1.
	Session name . . .	Optional user text
	Pages per session . . .	04 pages maximum
	Soft char sets/session	Two each S1 and S2
	Save settings for all	
	Restore settings for all	
	Copy settings from	
	Update session	At regular intervals

Setup feature	First level	Mandatory setting or description
Display	Lines per screen	24, 25, or 26
	Lines per page	24 lines X 01 pages
	Review previous lines	ON
	Columns per page	80 columns, clear on change
	Status display	Local status
	Scrolling mode	Jump
	Screen background	Dark
	Cursor display	Enable cursor, Block, Blink.
	Cursor coupling	Set to Vertical and Page.
	Cursor direction	Left to right
	Copy direction	Left to right
	Zero	Select style of zero you want to display.
	Auto Wrap	ON
	New line mode	
	Lock user preferences	
	Show control characters	
	CRT saver	
	Energy saver	
	(Overscan)	
	Framed windows	ON (Set to OFF to enable Overscan.)
	Screen alignment	
Terminal type	Emulation mode	VT520
	Terminal ID to host	VT520
	VT default char set	DEC Multinational—see user documentation as well.
	PC term character set	DEC Multinational—see user documentation as well.
	(7-bit NCRS characters)	
	Transmit 7-bit cable	ON
(ASCII emulation)		

Setup feature	First level	Mandatory setting or description
Keyboard	VT keyboard language	Select appropriate language—Canadian English
	(PC keyboard language)	
	Define key . . .	Use Define Key Editor screen to set the following: F1=Hold Ignore Alt F2=Print ,< and .> Keys F3=Setup <> Key F4=Session `~ Key F5=Break
	Save key definitions	
	Recall key definitions	
	Lock key definitions	
	Caps lock function	Caps lock
	Keyclick volume	High
	Warning bell volume	High
	Margin bell volume	OFF
	Keyboard encoding	Character (ASCII)
	Auto Repeat	
	Data processing keys	
	Application cursor keys	
	Application keypad mode	
	(Map PC keyboard to VT)	
	Ignore missing keyboard	

Setup feature	First level	Mandatory setting or description
Communication	Port select . . .	See "Port selection for VT520" on page A-15.
	Word size	8 bit
	Parity	None
	Stop bits	1 bit
	Transmit speed	2400 baud (9600 with Enhanced MMP40)
	Receive speed	Transmit speed
	Transmit flow control	XON/XOFF
	Receive flow control	XON/XOFF
	Flow control threshold	Low
	Transmit rate limit	150 cps
	Fkey rate limit	150 cps
	Ignore Null character	ON
	Local echo	
	Half duplex	
	Auto answerback	ON
	Answerback message . . .	Enter the answerback message.
	Answerback concealed	
Modem	Enable modem control	
	(Disconnect delay)	
	(Modem high speed)	
	(Modem low speed)	
Printer	Port select . . .	See "Port selection for VT520" on page A-15.
	Print mode	Normal
	Printer type	DEC ANSI
	DEC/ISO char sets	Country dependent setting
	(PC character sets)	
	Print extent	Full page
	Print terminator	None
	Serial print speed	9600 baud
	2-way communication	XON/XOFF
	Transmit flow control	ON
	Receive flow control	XON/XOFF
	Word size	8 bits
	Parity	None
	Stop bits	1 bit

Setup feature	First level	Mandatory setting or description
Tabs	Tabs Set-Up Screen	
Set-up language		User dependent
On-line		ON
Save settings		When settings are complete, press Enter to save.
Restore settings		
Exit Set-up		

Port selection for VT520

S1	S2	S3	S4
Comm	Comm	Comm	Comm
○	○	● Off	● Off
● com1	○		
○	● com2		
○	○		
Print	Print	Print	Print
○	○	○	○
○	○	○	○
● com3	● com3	● com3	● com3
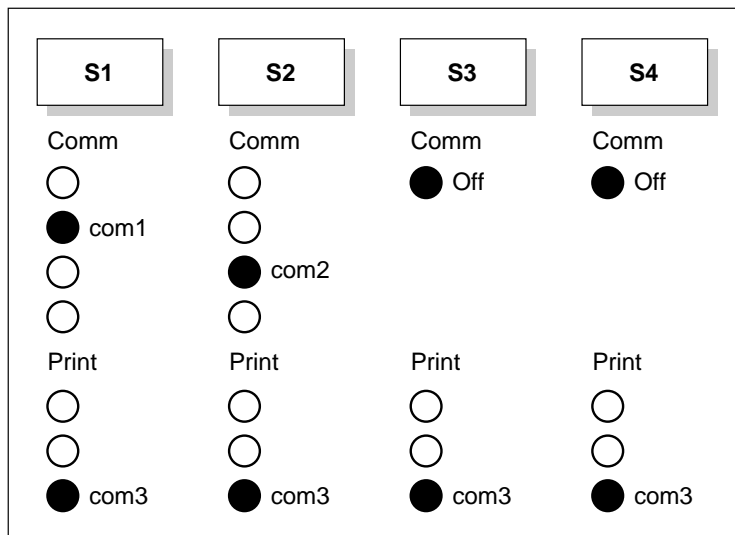
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Configuring an NT220 terminal

Configuring an NT220 terminal   To configure an NT220 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located in the top row of function keys. If no key is marked SETUP, press the third key from the left in 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 because of 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 "NT220 setup screens" on page A-17.
	Use the following keys to view and change setup values:
	Arrow keys Move from field to field.
	Return Scroll through possible values or cause the requested action to take place (depends on the type of field).
	To move to the next setup screen, select To Next Set-Up on any other setup screen.
4	To save changes, return to the General Set-Up screen, move the cursor to the Save Current Values field, and press Return.
5	To exit setup mode, press the SETUP key.

NT220 setup screens

General Set-Up

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

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

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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**

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Configuring an HP700/22 terminal

**Configuring an
HP700/22 terminal**

To configure an HP700/22 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located on the top row of function keys. If no key is marked SETUP, press the third key from the left on the top row.
	The General setup screen is displayed with the current setup values.
	Note: There may be minor differences between what you see in this chapter and the contents of the setup screens on your terminal. This is because of 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 "HP700/22 setup screens" on page A-20.
	Use the following keys to view and change setup values:

Arrow keys	Move from field to field.
Return	Scroll through possible values or cause the requested action to take place (depends on type of field).

Step	Action
4	To save changes, return to the General Setup screen, move the cursor to the Save field, and press Return.
5	To exit setup mode, press the SETUP key.

HP700/22 setup screens

```
                                    General Setup
                  Clear Display    Clear Communications    Reset Terminal
                         Recall      Save      Default     Setup = English

Terminal Mode      EM200, 7 Bit Ctrls    EM100 ID                  EM200
On Line            YES                   Interpret Control Mode    YES
Columns            80                    User Features Locked      NO
Smooth Scroll      YES                   User Defined Keys Locked  NO
Block Cursor       YES                   Numeric Mode Keypad       NO
Cursor OFF         NO                    Normal Mode Cursor Keys   YES
Light Background   NO                    National Character Set    NO
Inhibit Auto Wrap  NO                    Frame Rate                72
New Line           NO                    Display OFF After (min)   15
MultiPage          NO
Status Line        Indicator
```

```
                                 Communications Setup

Host
Xmit Baudrate      9600                  XON/XOFF                  @ 64
Recv Baudrate      =Xmit                 Disconnect Delay          2 s
DataBits/Parity    8/None                Stop Bits                 1
Check Parity       NO                    Local Echo                NO
Port Selection     EIA, Data Leads Only  Unlimited Xmit            NO

Printer
Baudrate           9600                  Print Mode                Normal
DataBits/Parity    8/None                Print Scroll Region       NO
Stop Bits          1                     Terminator                None
Character Set      National Only
```

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HP700/22 setup screens (continued)

```
                              Keyboard Setup

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

Answerback =                          Auto Answerback             NO

              ┌─────────────────────────┐
              │                         │
              └─────────────────────────┘

Conceal Answerback         Clear All Tabs          Set 8 Column Tabs
┌──────────────────────────────────────────────────────────────────┐
│   T       T       T       T       T       T       T       T     T │
└──────────────────────────────────────────────────────────────────┘
12345678901234567890123456789012345678901234567890123456789012345678901234567890123

┌────────────────────────────────────────────┐
│    T       T       T       T       T      T │
└────────────────────────────────────────────┘
1234567890123456789012345678901234567890123456789012345678
```

```
                    Programmable Function Key Setup

Function Key        F6                    Clear Key

Qualifier Key       Shift                 Clear All Keys

Key Definition


┌──────────────────────────────────────────────────────────────────┐
│                                                                    │
└──────────────────────────────────────────────────────────────────┘
```

G101096

Configuring a VT320 terminal

Configuring a VT320 terminal

To configure a VT320 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located in the top row of function keys. If no key is marked SETUP, press the third key from the left in 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 because of 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 "VT320 setup screens" on page A-23.
	Use the following keys to view and change setup values:
	Arrow keys Move from field to field.
	Return Scroll through possible values or cause the requested action to take place (depends on the type of field).
	To move to another setup screen, select a screen from the top line of the Setup Directory screen and press Return. To move to the next setup screen, select To Next Set-Up on any other setup screen.
4	To save changes, return to the Setup Directory screen, move the cursor to the Save field, and press Return.
5	To exit setup mode, press the SETUP key.

VT320 setup screens

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

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

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

```
Communications Set-Up
To Next Set-Up    To Directory    Transmit=9600    Receive=Transmit
Xoff @ 128    8 Bits, No Parity    1 Stop Bit    No Local Echo
DEC 423, Data Leads Only    Disconnect, 2 s Delay    Limited Transmit
No Auto Answerback    Answerback =                   Not Concealed
```

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

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

G101097

Configuring a VT220 terminal

Configuring a VT220 terminal   To configure a VT220 terminal, follow these steps.

Step	Action
1	Power on the terminal.
2	Enter setup mode by pressing the SETUP key located in the top row of function keys. If no key is marked SETUP, press the third key from the left in 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 because of 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 "VT220 setup screens" on page A-25. Use the following keys to view and change setup values: Arrow keys — Move from field to field. Return — Scroll through possible values or cause the requested action to take place (depends on the type of field). To move to another setup screen, select a screen from the top line of the Setup Directory screen and press Return. To move to the next setup screen, select To Next Set-Up on any other setup screen.
4	Save changes by returning to the Setup Directory screen, moving the cursor to the Save field, and pressing Return.
5	To exit setup mode, press the SETUP key.

VT220 setup screens

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

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

```
General Set-Up
To Next Set-Up    To Directory    VT200 Mode, 7 Bit Controls
User Defined Keys Unlocked    User Features Unlocked    Multinational
Application Keypad    Normal Cursor Keys    No New Line
```

```
Communications Set-Up
To Next Set-Up    To Directory    Transmit=9600    Receive=Transmit
Xoff at 128    8 Bits, No Parity    1 Stop Bit    No Local Echo
EIA Port, Data Leads Only    Disconnect, 2 s Delay    Limited Transmit
```

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

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

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Appendix B

Modem configurations

In this appendix

Overview

Introduction

Each modem supplied with Meridian Mail needs to be configured before use. Modems must be configured so that the baud rate matches that of the terminal and the CPU's non-volatile random access memory (NVRAM).

Connection speed

The modems are configured so that the connection from the modems to Meridian Mail operates at a speed that is independent of the telephone line connection. Therefore, an older 2400 bps modem (such as the Ven-Tel 2400-33) can be set to communicate with Meridian Mail at 9600 bps, while the telephone connection operates at the maximum modem speed of 2400 bps.

Configuration

All modems, with the exception of UDS, need to be connected to a terminal for configuration. If you wish, you can connect a modem temporarily to the Meridian Mail administration terminal for configuration, and move it to its permanent location afterward.

To configure a modem, you must

1.   Temporarily connect the local administration terminal to the local modem.

   –   For 2400 bps access, set the terminal to 2400 bps.
   –   For 9600 bps access, set the terminal to 9600 bps.

2.   Send the appropriate commands to the modem.

Note: The UDS modem can be configured from its front panel if you prefer.

ATTENTION

Use a remote modem or terminal that is operating at the same speed as the Meridian Mail local administration terminal you are accessing to prevent flow control problems.

Configuration of modems can vary slightly from one model to the next. When you configure a modem, refer to the manual that accompanies it as well as the procedures in this chapter.

Supported modems

Introduction   The following table lists the modem models that are supported in Meridian Mail Release 13, whether the modem can be used for local or remote access, and in which bps operation it can be used.

Supported modems

	Local modem (console speed)		Remote access modem (line speed)	
	2400 bps	**9600 bps**	**2400 bps**	**9600 bps**
U.S. Robotics Sportster 14.4	✓	✓	✓	✓
Racal ALM 3223	✓	✓	✓	✓
Hayes Optima 144	✓	✓	✓	✓
UDS 2440	✓	✓	✓	✓
UDS EC 224 A/D	✓	✓	✓	✓
Ven-Tel 2400-33/2400 Plus II	✓	✓	✓	✓
Ven-Tel 9600 Plus/9600 Plus II	✓	✓	✓	✓

Sections   This chapter is divided into the following sections:

- *Connecting the modem to the administration terminal* This section provides instructions for connecting the modem to the administration terminal so it can be configured for use. This section applies to all modems regardless of their make or model.

- *U.S. Robotics modem*   This section describes how to configure the U.S. Robotics modem as either a local or a remote access modem.

- *Racal modem*   This section describes how to configure the Racal modem as either a local or a remote access modem.

- *Hayes modem*   This section describes how to configure the Hayes modem as either a local or a remote access modem.

- *UDS modems*   This section describes how to configure the UDS modem as either a local or a remote access modem.

- *Ven-Tel modems*   This section describes how to configure the Ven-Tel modem as either a local or a remote access modem.

Refer to the appropriate section for the modem you are using.

Connecting the modem to the administration terminal

Introduction

Before use, configure the local and remote modems. The local modem is the one connected to the Meridian Mail system. You need to connect the modem to a VT220 terminal (the Meridian Mail administration terminal) and send commands to the modem as described. The remote modem is the one used by offsite personnel to dial in to a Meridian Mail system.

Note: Before configuring the modem, you must first configure the terminal to the desired speed. This determines the modem's default speed when resetting or powering up.

- For modem 2400 bps access, set the terminal to 2400 bps.
- For modem 9600 bps access, set the terminal to 9600 bps.

The baud rate of the Meridian Mail CPU can be set at either 2400 bps or 9600 bps. You must configure modems so the baud rate matches that of the terminal and the CPU's NVRAM using the Change Speed utility. Access this utility through the System Installation and Modification menu on the Install/data tape (on the System Operation Utility menu), or in the System and Feature Dependent Utilities on the TOOLS menu. After you set the speed, reset the terminal and remote modem to match the baud rate of the CPU card.

Connecting the modem

To connect the modem to the terminal, follow these steps.

Step	Action
1	Connect one end of a straight RS-232 cable (NTND91AA/AB) to the 25-pin modem connector.
2	Plug the modem power cord into an AC receptacle.
3	Power on the modem.
4	Temporarily disconnect the administration terminal from the A/B switchbox.
5	Connect the free end of the modem cable to the terminal so you can configure the modem.

Step	Action
6	Set the terminal to the same speed that the Meridian Mail administration terminal uses, either 2400 bps or 9600 bps.
	The modem automatically saves this speed when the configuration is saved.
7	Program the modem. Refer to the appropriate section of this chapter for the modem you are programming.
8	Disconnect the administration terminal from the modem cable.
9	Reconnect the administration terminal to the A/B switchbox.
10	For a local modem, connect the free end of the modem cable to the B connector on the A/B switchbox. Then connect the modem to the phone line provided for remote support.

U.S. Robotics modem

Introduction   The U.S. Robotics Sportster 14.4 modem has DIP switches on
                          the rear (see the following illustration). These have to be set as
                          indicated in the configuration instructions. The down position is
                          On, and the switches are numbered from 1 through 8.

                          Note: You can use the U.S. Robotics modem to dial in to
                          Meridian Mail systems that use other brands of local modem
                          (for example, Ven-Tel EC2400-33). The remote modem and
                          terminal should be used at 9600 bps only when the local modem
                          is capable of 9600 bps operation (for example, the U.S.
                          Robotics modem, but not the Ven-Tel EC2400-33) *and* the
                          Meridian Mail local administration terminal is used at 9600 bps.
                          In all other cases, 2400 bps should be used. This will prevent
                          flow control problems.

                          U.S. Robotics Sportster 14.4
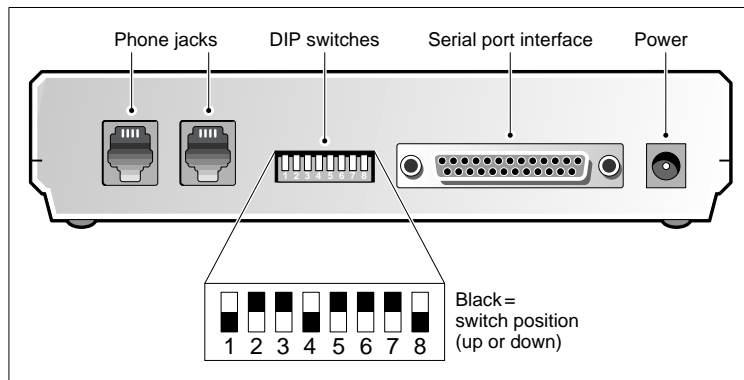
                          Procedures   Refer to one of the following procedures:

                          • "Configuring the U.S. Robotics Sportster 14.4 modem as a
                            local modem" on page B-8 to configure a local modem
                            operating at either 2400 bps or 9600 bps.
                          • "Configuring the U.S. Robotics Sportster 14.4 modem as a
                            remote-access modem" on page B-8 to configure a remote-
                            access modem operating at either 2400 bps or 9600 bps.

Configuring the U.S. Robotics Sportster 14.4 modem as a local modem

To configure the U.S. Robotics Sportster 14.4 modem as a local modem, follow these steps.

Step	Action
1	Power off the modem.
2	Set DIP switches 1, 3, 7, and 8 to the down position for all programming (all other switches should be up).
3	Power on the modem.
4	Enter the commands below, from the administration terminal, to configure the modem.
	The administration terminal should be set to the Meridian Mail console speed (either 2400 bps or 9600 bps).
	AT&F0 <Return> (response is OK)
	ATS0=1 <Return> (response is OK)
	AT&B1 <Return> (response is OK)
	ATY0 <Return> (response is OK)
	ATQ1 <Return> (no response)
	AT&W0 <Return> (no response)
	AT&W1 <Return> (no response)
5	Power off the modem.
6	Verify that DIP switches 1, 4, and 8 are down (all the others should be up).

Configuring the U.S. Robotics Sportster 14.4 modem as a remote-access modem

To configure the U.S. Robotics Sportster 14.4 modem as a remote-access modem, follow these steps.

Note: This configuration can be used to dial in to a system with a U.S. Robotics modem. For systems with another modem, it may need to modify other parameters (for example, disabling error correction).

Step	Action
1	Power off the modem.
2	Set DIP switches 3, 5, 7, and 8 to the down position for all programming (all other switches should be up).
3	Power on the modem.

Step	Action
4	Enter these commands from the administration terminal (set to either 2400 bps or 9600 bps) to configure the modem.

AT&F0 <Return>   (response is OK)

ATS0=0 <Return>   (response is OK)

ATY0 <Return>   (response is OK)

AT&M0 <Return>   (response is OK)

AT&W0 <Return>   (response is OK)

AT&W1 <Return>   (response is OK)

Step	Action
5	Power off the modem.
6	Set DIP switches 3, 5, and 8 to down (all other switches should be up).

Racal modem

Introduction   To configure the Racal ALM 3223 modem, use the
administration terminal set up for either 2400 bps or 9600 bps
operation.

Note: There are no DIP switches for this modem.

Procedures   Refer to one of the following procedures:

- "Configuring the Racal ALM3223 modem as a local
  modem" below, to configure the Racal as a local modem
  operating at either 2400 bps or 9600 bps.

- "Configuring the Racal ALM3223 modem as a remote-
  access modem" on page B-11 to configure the Racal
  modem as a remote-access modem operating at either 2400
  bps or 9600 bps.

Configuring the Racal   To configure the Racal ALM3223 modem as a local modem,
ALM3223 modem as a   follow these steps.
local modem

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).

Step	Action
2	Enter the following commands from the terminal:

AT&F <Return>   (response is OK)

AT&Y0 <Return>   (response is OK)

AT0, 0 <Return>   (response is OK)

AT1 <Return>   (response is OK)

AT0 <Return>   (response is OK)

AT&D0 <Return>   (response is OK)

AT&S2 <Return>   (response is OK)

ATS61=3 <Return>   (response is OK)

ATS43=3 <Return>   (response is OK)

ATS44=7 <Return>   (response is OK)

ATQ1 <Return>   (no response)

ATE0 <Return>   (no response)

AT&W0 <Return>   (no response)

Configuring the Racal ALM3223 modem as a remote-access modem

To configure the Racal ALM3223 modem as a remote-access modem, follow these steps.

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).
2	Enter the following commands from the terminal:

AT&F <Return>   (response is OK)

AT&Y0 <Return>   (response is OK)

AT0, 0 <Return>   (response is OK)

AT1 <Return>   (response is OK)

AT0 <Return>   (response is OK)

ATS0=0 <Return>   (response is OK)

AT&S2 <Return>   (response is OK)

ATS43=3 <Return>   (response is OK)

ATS44=7 <Return>   (response is OK)

AT&W0 <Return>   (response is OK)

AT&W1 <Return>   (response is OK)

Hayes modem

Introduction   To configure the Hayes Optima 144 modem, use the
                          administration terminal set up for either 2400 bps or 9600 bps
                          operation.

                          Note: There are no DIP switches for this modem.

Procedures   Refer to one of the following procedures:

                          • "Configuring the Hayes Optima 144 modem as a local
                            modem" below, to configure the Hayes as a local modem
                            operating at either 2400 bps or 9600 bps,

                          • "Configuring the Hayes Optima 144 modem as a remote-
                            access modem" on page B-13 to configure the Hayes as a
                            remote-access modem operating at either 2400 bps or 9600
                            bps.

Configuring the Hayes To configure the Hayes Optima 144 modem as a local modem,
Optima 144 modem as   follow these steps.
a local modem

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).
2	Enter the following commands from the terminal:

	AT&F <Return>	(response is OK)
	AT&K2 <Return>	(response is OK)
	ATS0=1 <Return>	(response is OK)
	ATS37=9 <Return>	(response is OK)
	ATS46=0 <Return>	(response is OK)
	ATT <Return>	(response is OK)
	ATQ1 <Return>	(no response)
	ATE0 <Return>	(no response)
	AT&W0 <Return>	(no response)
	AT&W1 <Return>	(no response)

Configuring the Hayes Optima 144 modem as a remote-access modem

To configure the Hayes Optima 144 modem as a remote-access modem, follow these steps.

Step	Action
1	Connect the modem to the administration terminal (see "Connecting the modem" on page B-5).
2	Enter the following commands from the terminal:
	AT&F <Return> (response is OK)
	ATT <Return> (response is OK)
	AT&K2 <Return> (response is OK)
	ATS0=1 <Return> (response is OK)
	ATS37=9 <Return> (response is OK)
	ATS46=0 <Return> (response is OK)
	AT&W0 <Return> (response is OK)
	AT&W1 <Return> (response is OK)

UDS modems

Introduction   The following versions of UDS modems are supported in
                          Release 13 of Meridian Mail:

- *2440*   This modem can be used as a local modem
  operating at either 2400 bps or 9600 bps, or as a remote-
  access modem operating at 2400 bps. The UDS 2440 can
  be configured using either the front panel or the
  administration terminal.

- *224 A/D*   This modem can be used as a local modem
  operating at either 2400 bps or 9600 bps, or as a remote-
  access modem operating at 2400 bps.

UDS 2440 modem   To configure the UDS 2440 modem as a local modem operating
                          at either 2400 bps or 9600 bps, use either the administration
                          terminal or the front panel on the modem. (The modem can only
                          be configured as a remote-access modem using the
                          administration terminal.) The front panel of the modem contains
                          a small display and several buttons (YES, NO, and TALK) that
                          are used to configure the modem.

UDS 2440 modem—front panel
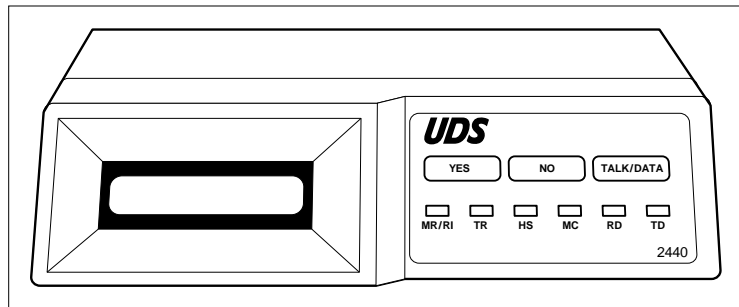
g100001

Procedures   Refer to one the following procedures:

- "Configuring the UDS 2440 modem as a local 2400 bps
  modem" on page B-15

- "Configuring the UDS 2440 modem as a local 2400 bps
  modem" on page B-16

- "Configuring the UDS 2440 modem as a local 9600 bps modem" on page B-18
- "Configuring the UDS 2440 modem as a local 9600 bps modem" on page B-20
- "Configuring the UDS 2440 as a remote-access 2400 bps modem" on page B-20

Configuring the UDS 2440 modem as a local 2400 bps modem

To use the terminal to configure the UDS 2440 modem as the local modem operating at 2400 bps, follow these steps.

Step	Action
1	Connect the modem to a terminal using a straight-through cable.
2	Enter **at&f s14=140** <Return> from the terminal. 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.
3	Enter **at&w** <Return>.
4	Turn the modem off, wait 10 seconds, then turn it back on.

Configuring the UDS 2440 modem as a local 2400 bps modem

To use the front panel to configure the UDS 2440 modem as the local modem operating at 2400 bps, follow these steps.

Note: The front panel of the modem contains a small display and several buttons (YES, NO, and TALK) that are used to configure the modem.

Step	Action
1	Plug in the modem and turn it on.
2	Press the YES button until OFFLINE appears in the display window.
3	Press NO in response to the OFFLINE prompt.
4	Press NO to advance to the next desired prompt.
5	Enter the appropriate response for each prompt listed in the following table to configure the modem.

UDS 2440 modem configuration (front panel method)

Prompt	Response
OFFLINE	NO
DIAL?	NO
TEST	NO
AUTO ANS	NO
DATA OPTS?	NO
OPTIONS?	YES
RESET?	YES
LOADING (appears for one second)	
RESET	NO
FACTORY?	YES
FACTORY 0?	YES
LOADING (appears for one second)	
FACTORY?	NO
SPKR OPTS?	NO
TELE OPTS?	NO
PIN OPTS?	NO
MSG OPTS?	NO
SECURITY?	NO
DISC OPTS?	NO
SREGS?	NO
OPTIONS?	NO

Prompt	Response
PROTOCOL?	NO
If this configuration is different from the stored configuration, SAVE appears; otherwise OFFLINE is displayed.	
If SAVE? appears	YES
SAVING (appears for two seconds)	
OFFLINE?	NO
DIAL?	NO
TEST?	NO
AUTO ANS?	YES
AUTO ANS E?	YES
RINGS?	YES
RING= 001?	YES
AUTO ANS	NO
DATA OPTS?	NO
OPTIONS?	YES
RESET?	NO
FACTORY?	NO
SPKR OPTS?	NO
TELE OPTS?	NO
PIN OPTS?	YES
DTR OPTS?	YES
DTR OPTS 0?	NO
dtr opt 1	NO
dtr opt 2	NO
dtr opt 3	YES
DTR OPTS?	NO
DSR OPTS?	YES
DSR FORCED?	NO
DSR normal	YES
DSR OPTS?	NO
CD OPTS?	YES
CD FORCED?	NO
lo at disc	NO
cd normal	YES
CD OPTS?	NO
CTS OPTS?	NO
P 21 OPTS?	NO
P 23 OPTS?	NO
P 25 OPTS?	NO

Prompt	Response
PIN OPTS?	NO
MSG OPTS?	NO
SECURITY?	NO
DISC OPTS?	NO
SREGS?	NO
OPTIONS?	NO
PROTOCOL?	NO
If this configuration is different from the stored configuration, SAVE appears; otherwise OFFLINE is displayed.	
SAVE?	YES
SAVING (appears for two seconds)	
OFFLINE	

Configuring the UDS 2440 modem as a local 9600 bps modem

To use the front panel to configure the UDS 2440 modem as the local modem operating at 9600 bps, follow these steps.

Step	Action
1	Press the NO button to advance to the OPTIONS? prompt.

Step	Action
2	Respond to the appropriate prompt as outlined in the following table.

UDS 2440 modem configuration (front panel method)

Prompt	Response
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

Step	Action
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, 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.
5	If you have already saved the configuration, start over from step 1.

Configuring the UDS 2440 modem as a local 9600 bps modem

To use the terminal to configure the UDS 2440 modem as the local modem operating at 9600 bps, follow this step.

Step	Action
1	Enter the commands, as shown in the following table, on the administration terminal to configure the modem.

UDS 2440 modem configuration commandss

Command	Response
OPTIONS?	YES
at&f3 <Return>	OK
at&c1 <Return>	OK
ats0=1 <Return>	OK
at e0 s14=140 <Return>	No response is seen on the terminal after this command.
at&w <Return>	

Configuring the UDS 2440 as a remote-access 2400 bps modem

To configure the UDS 2440 modem and the remote-access modem operating at 2400 bps through the terminal, follow these steps.

Step	Action
1	Connect the modem to a terminal using a straight-through cable.
2	Enter **at&f s14=140** <Return> from the terminal. 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.
3	Enter **at&w** <Return>.
4	Turn the modem off, wait 10 seconds, then turn it back on.

UDS 224 A/D modem   Refer to one of the following procedures:

- "Configuring the UDS 224 A/D as a local 2400 bps modem" below
- "Configuring the UDS 224 A/D as a 9600 bps local modem" on page B-23
- "Configuring the UDS 224 A/D as a 2400 bps remote-access modem" on page B-23

Configuring the UDS 224 A/D as a local 2400 bps modem   To configure the UDS 224 A/D modem as a local 2400 bps modem, follow these stepsl.

Step	Action
1	Turn the front panel rotary switch to Data.
2	Set the modem DIP switches as defined in "UDS EC 224 A/D modem hardware configuration for 2400 bps operation" on page B-22.
3	Connect the modem to a terminal using a straight-through cable.
4	Enter **at&f s14=140** and press <Return>. The cursor returns to "A" on the same line. ***Note:*** This step disables the echo of the modem. Enter the following commands carefully, because you will no longer see your input on the terminal screen.
5	Enter **at&w** <Return>.
6	Turn the modem off, wait 10 seconds, then turn it back on.

UDS EC 224 A/D modem hardware configuration for 2400 bps operation

Front panel switches		
Rotary switch: —DATA position when using terminal to dial. —TALK position when using TELSET to dial. Switch to DATA position once connected.		
Three-position toggle switch: HI position 2400 bps Speed Select.		
Circuit board mount DIP switches		
Switch 1 (S1)		
S1-1	On	Attempt MNP error correction protocol
S1-2	Off	Disable DCE independent speed
S1-3	Off	Switched network
S1-4	On	Private line originate
S1-5	On	Enable auto-answer
S1-6	Off	Operate in 224 A/D mode
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
S3-1	Off	DTR disconnect disabled
S3-2	On	Carrier disconnect = 100mS
S3-3	Off	Disable use of CH pin
S3-4	Off	Disable DTE Analog loopback

Configuring the UDS 224 A/D as a 9600 bps local modem

To configure the UDS 224 A/D modem as a local modem operating at 9600 bps, follow these steps.

Step	Action
1	Put the front panel rotary switch in the Data position.
2	Set the modem DIP switches as defined in "UDS EC 224 A/D modem hardware configuration for 2400 bps operation" on page B-22.
3	Connect the modem to a terminal using a straight-through cable.
4	Enter **at&f &c1 &d0 %v2 S0=1** 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.
5	Enter **ate0 q1&w** <Return>.
6	Turn the modem off, wait 10 seconds, then turn it back on.

Configuring the UDS 224 A/D as a 2400 bps remote-access modem

To configure the UDS 224 A/D modem as a remote-access modem operating at 2400 bps, follow these steps.

Step	Action
1	Put the front panel rotary switch in the Data position.
2	Connect the modem to a terminal using a straight-through cable.
3	Enter **at&f &w** <Return>. Factory default settings are used for the UDS modem. See "UDS EC 224 A/D modem hardware configuration for 2400 bps operation" on page B-22.

UDS EC 224 A/D modem hardware configuration for 9600 bps operation

Front panel switches
Rotary switch: —DATA position when using terminal to dial. —TALK position when using TELSET to dial. Switch to DATA position once connected.
Three-position toggle switch: HI position 2400 bps Speed Select.

Circuit board mount DIP switches		
Switch 1 (S1)		
S1-1	On	Attempt MNP error correction protocol
S1-2	On	Enable 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	On	
S2-5	Off	
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

Ven-Tel modems

Introduction

The following versions of Ven-Tel modems are supported in Release 13 of Meridian Mail:

- *2400-33, rev. 5.2 or 6.0* This modem can be used as a local modem operating at either 2400 bps or 9600 bps, or as a remote-access modem operating at 2400 bps.

- *2400-33 Plus II* This modem can be used as a local modem operating at either 2400 bps or 9600 bps, or as a remote-access modem operating at 2400 bps.

- *9600 Plus/Plus II* This modem can be used as either a local or a remote-access modem operating at 2400 bps or 9600 bps.

Switches on the Ven-Tel 2400-33/2400 Plus II modem

You do not need to change the switch settings on these models if you are currently using the modem at 2400 bps and want to use it at 9600 bps. However, if you have not already set the switches, use the settings described on this and the next page for both local and remote use.

Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem

To set the switches on the Ven-Tel 2400-33/2400 Plus II modem, follow these steps.

Step	Action
1	Remove the modem cover and verify that the E-PROM label shows version 5.2 or higher.
2	Locate the modem switch block, which may be labeled S2.

Step	Action
3	Set the switches 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.

Setting the switches on the Ven-Tel 9600 Plus/ 9600 Plus II modem

You must set SW2. The SW2 settings are the same for both local and remote use.

Note: The factory default settings can be used.

To set the switches on the Ven-Tel 9600 Plus/Plus II modem, follow this step.

Step	Action
1	Set SW2 according to "Settings for SW2 for the Ven-Tel 9600 Plus modem" on page B-27.

Settings for SW2 for the Ven-Tel 9600 Plus modem

SW2		Setting
1	Force CTS/Override &R command	ON
	CTS Follows &R command	**OFF**
2	CD Forced/Override &C command	ON
	CD Follows &C command	**OFF**
3	DSR Forced/Override &S command	ON
	DSR Follows &S command	**OFF**
4	Disable AT commands	ON
	Enable AT commands	**OFF**
5	4-wire leased line (9600 Plus II)	ON
	2-wire leased line	**OFF**
6	Modem reset	see note
7	Not used	
8	Not used	
Note: SW2-6 is used to reset the modem to the asynchronous command mode if &M2, &M3, &M6, or &M7 is set. To reset the modem from synchronous to asynchronous, SW2-6 must be turned on prior to powering up. Also, the SW2-6 switch may be used to reset the modem if an improper *V command string is used.		

Setting the switches on the Ven-Tel 9600 Plus II modem

You must set both SW2 and SW6. The SW2 settings are the same for both local and remote use.

Note: The factory default settings can be used.

To set the switches on the Ven-Tel 9600 Plus II modem, follow these steps.

Step	Action
1	Set SW2 as described in "Setting the switches on the Ven-Tel 9600 Plus/9600 Plus II modem" on page B-26.
2	Set SW6 according to "Settings for SW6 for the Ven-Tel 9600 Plus II modem" on page B-28.

Settings for SW6 for the Ven-Tel 9600 Plus II modem

SW6		Setting
1	**Telset Enable**	**ON**
	Telset Disable	OFF
2	**Telset Enable**	**ON**
	Telset Disable	OFF
3	Telco J3 M1 Enabled/A Disabled	ON
	Telco J3 M1 Disabled/A Enabled	**OFF**
4	J3 MIC Enabled/A1 Disabled	ON
	J3 MIC Disabled/A1 Enabled	**OFF**

Configuring the Ven-Tel 2400-33/2400 Plus II as a local 9600 bps modem

To configure the Ven-Tel 2400-33/2400 Plus II as a local 9600 bps modem through the administration terminal, follow these steps.

Step	Action
1	Set the switches according to "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-25.
2	Enter the commands according to "Ven-Tel 2400-33/2400 Plus II modem configuration commands" on page B-29 on the administration terminal to configure the modem.

Ven-Tel 2400-33/2400 Plus II modem configuration commands

Enter the following command	System response
at&f <Return>	OK
at&c1<Return>	OK
at&d0 <Return>	OK
at3 <Return>	OK
at0 <Return>	OK
at11 <Return>	OK
ats0=1 <Return>	OK
ats64=1 <Return>	OK
at e0 s14=12 <Return>	No response is seen on the terminal after this command.
at&w <Return>	

Configuring the Ven-Tel 9600 Plus/ 9600 Plus II as a local 2400 bps or 9600 bps modem

Configure the Ven-Tel 9600 Plus/9600 Plus II modem for 2400 bps or 9600 bps operation through the administration terminal. The speed of the administration terminal determines the configured modem speed.

To configure the Ven-Tel 9600 Plus/9600 Plus II as a local 2400 bps or 9600 bps modem, follow these steps.

Step	Action
1	Set the switches according to "Setting the switches on the Ven-Tel 9600 Plus/9600 Plus II modem" on page B-26 or "Setting the switches on the Ven-Tel 9600 Plus II modem" on page B-27 depending on the modem.
2	To configure the modem, enter the commands shown in "Ven-Tel 9600 Plus/9600 Plus II modem configuration commands" on page B-30 on the administration terminal (set to either 2400 bps or 9600 bps).

Ven-Tel 9600 Plus/9600 Plus II modem configuration commands

Enter the following command	System response
at&f <Return>	OK
at&c1 <Return>	OK
at3 <Return>	OK
at0 <Return>	OK
at%f2 <Return>	OK
at0 <Return>	OK
ats0=1 <Return>	OK
ate0 q1 <Return>	No response is seen on the terminal after this command
at&w <Return>	

Configuring the Ven-Tel 2400-33/2400 Plus II as a local 2400 bps modem

You can use the Ven-Tel 2400-33/Plus II modem as a local 2400 bps modem. If you have not already set the switches, use the settings described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-25 for both local and remote use.

You do not need to change the switch settings on the Ven-Tel modem if you are currently using the modem for 2400 bps operation.

To configure the Ven-Tel 2400-33/2400 Plus II as a local 2400 bps modem, follow these steps.

Step	Action
1	Ensure that the switches are set as described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-25.
2	Connect the modem to a terminal using a straight-through cable.

Step	Action
3	Enter **at&f &d3 &c1 1 3 s0=1 s64=1 s14=12** <Return>.
	The cursor returns to "A" on the same line.
	Note: If the console port speed is set for 1200 bps, configure the modem with **0** instead of **1**.
	This step disables the echo of the modem. Enter the following command carefully, because you will no longer see your input on the terminal screen.
4	Enter **ate0 &w** <Return>.
5	Turn the modem off, wait 10 seconds, then turn it back on.

Configuring the Ven-Tel 2400-33/2400 Plus II as a remote-access 2400 bps modem

You can use the Ven-Tel 2400-33/Plus II modem as a remote-access modem operating at 2400 bps. Use "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-25 for both local and remote use.

To configure the Ven-Tel 2400-33/2400 Plus II as a remote-access 2400 bps modem, follow these steps.

Step	Action
1	Ensure that the switches are set as described in "Setting the switches on the Ven-Tel 2400-33/2400 Plus II modem" on page B-25.
2	Connect the modem to a terminal using a straight-through cable.
3	Enter **at&f** <Return>.
4	Enter **at&f 3 &c1 s14=170** <Return>.
	The response on the terminal is "OK."
5	Enter **at&w** <Return>.
6	Turn the modem off, wait 10 seconds, then turn it back on.

**Configuring the
Ven-Tel 9600 Plus/
9600 Plus II as a
remote-access
modem**

To configure the Ven-Tel 9600/9600 Plus II modem as a remote-access modem, follow these steps.

Step	Action
1	Connect the modem to a terminal using a straight-through cable.
2	The terminal should be set to the desired connect speed (either 2400 bps or 8600 bps). The terminal's bps determines the modem's bps.
3	Enter **at&f** <Return>.
4	Enter **at&f 3 &c1 s14=170** <Return>. The response on the terminal is "OK."
5	Enter **at&w** <Return>.
6	Turn the modem off, wait 10 seconds, then turn it back on.

Appendix C

Enhanced MMP40 (or MMP40) troubleshooting flowcharts

In this appendix

Overview

Introduction   The following charts can be used to determine causes of and
                       solutions to potential problems with the Enhanced MMP40 (or
                       MMP40) card. Start from the first chart, and follow through the
                       others until you have localized the problem. When you are
                       directed to the double-letter options (AA, BB, CC, and so on),
                       refer to the tables that follow the flowcharts.

Flowcharts

```
      ┌──────────────┐                          ┌──────────────┐
      │   Power-up   │──────────────────────────│    Reset     │
      └──────────────┘             │            └──────────────┘
                                   ▼
                        ┌────────────────────┐
                        │ Enhanced MMP40 EC  │
                        │ hardware logic     │
                        │ initializes        │
                        └────────────────────┘
                                   │
                                   ▼
  ┌──────────────┐   YES      ◇ Proceeds ◇    NO   ┌──────────────┐
  │ LED displays │◀───────────◇    ?     ◇────────▶│ LED display  │
  │ ".." or "0"  │            ◇          ◇         │ stuck at     │
  └──────────────┘                                 │ BLANK        │
          │                                        └──────────────┘
          ▼                                                │
    ◇ Proceeds ◇      NO                                   ▼
    ◇    ?     ◇───────────────┐                    ╭──────────────╮
    ◇          ◇               │                    │   Replace    │
          │                    │                    │ Enhanced     │
          ▼                    ▼                    │ MMP40 EC     │
  ┌──────────────┐     ┌──────────────┐             ╰──────────────╯
  │ Begins       │     │ LED display  │
  │ running      │     │ stuck at     │
  │ BootROM      │     │ ".." or "0"  │
  │ firmware     │     └──────────────┘
  └──────────────┘            │
          │                   ▼
          ▼            ╭──────────────╮
  ┌──────────────┐     │   Replace    │
  │ LED displays │     │ Enhanced     │
  │     "0"      │     │ MMP40 EC     │
  └──────────────┘     ╰──────────────╯
          │
          ▼
        ( A )
```
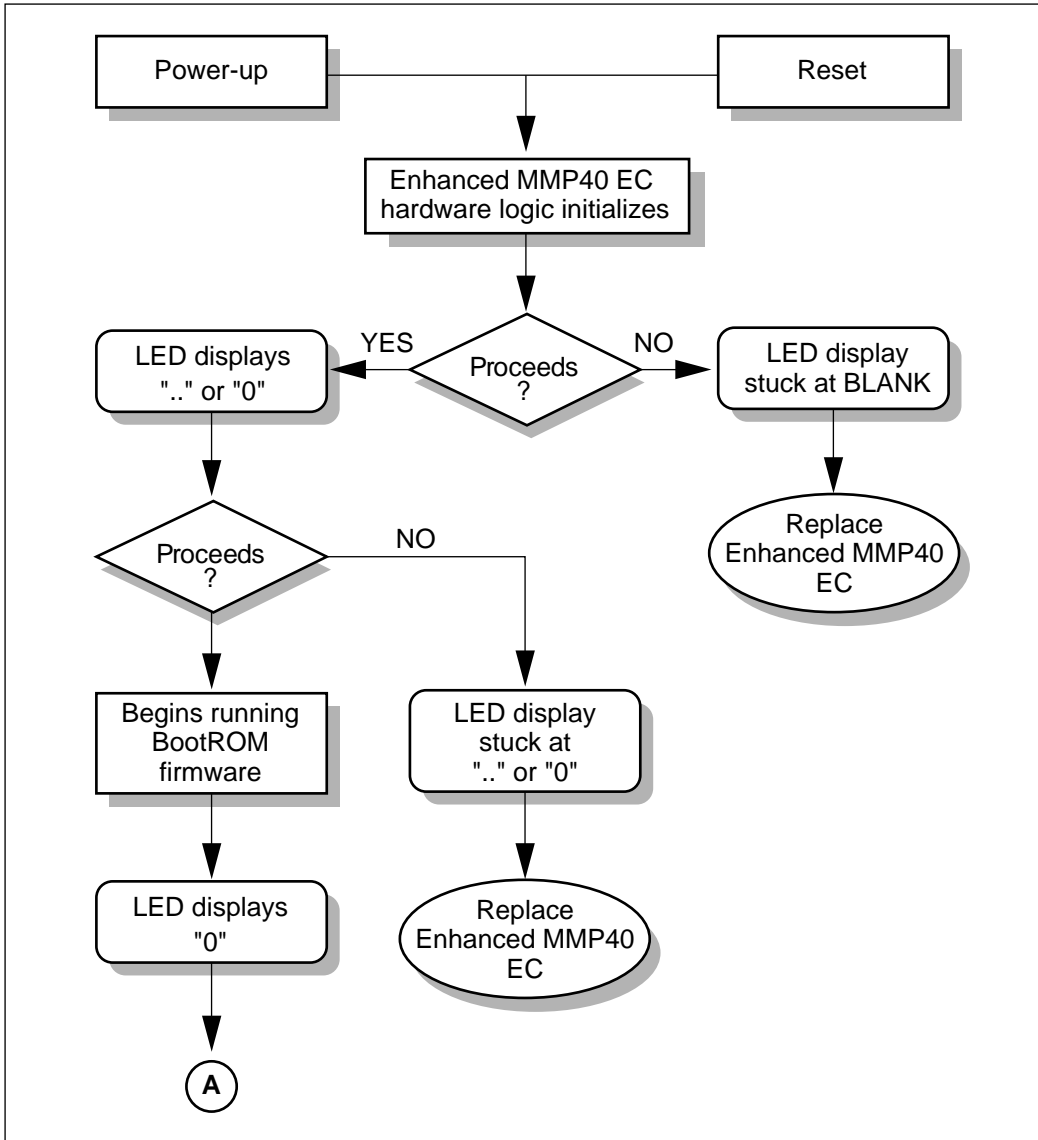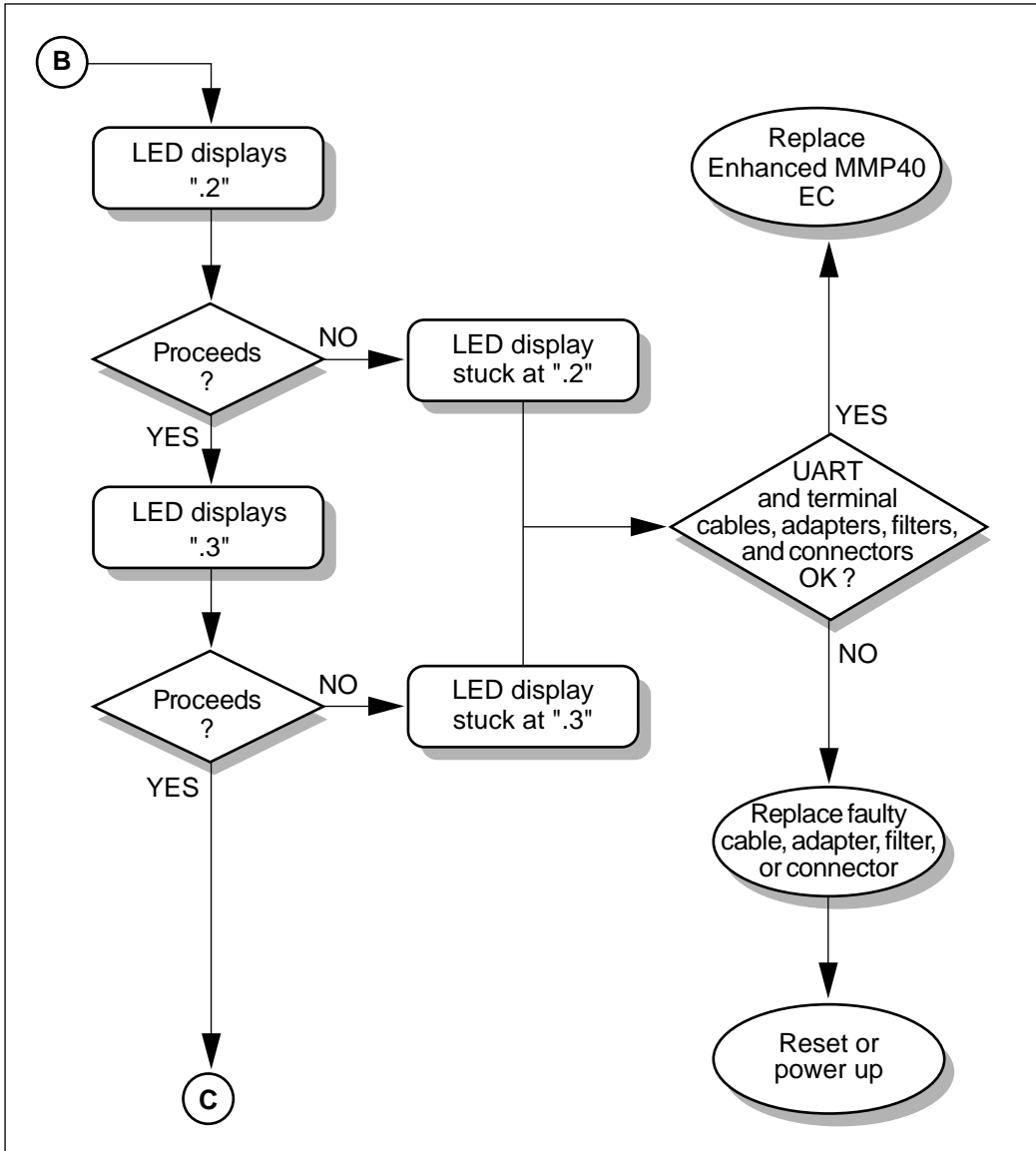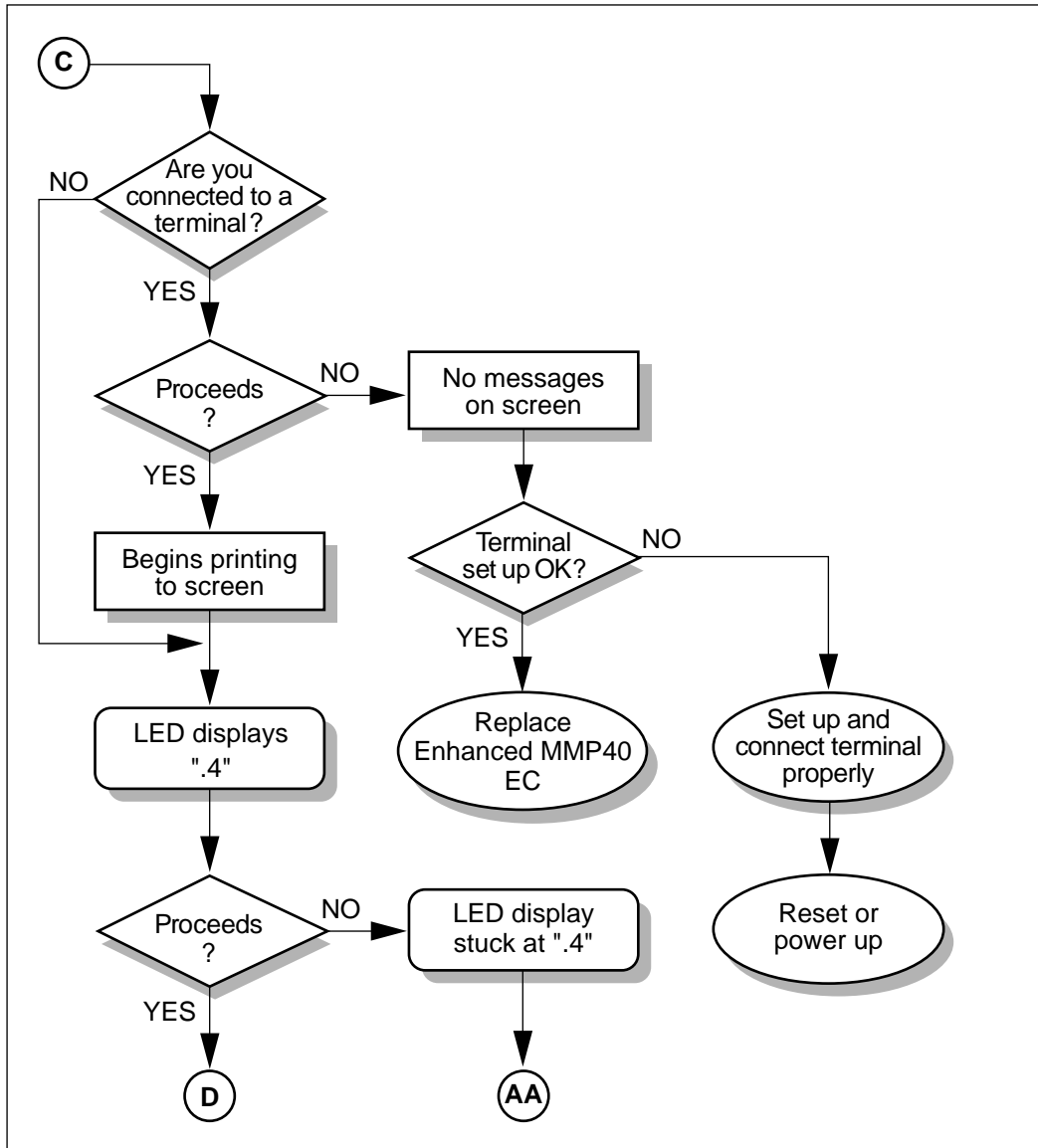
G100425/A

Flowcharts (continued)

```
    ( A )──────────┐
                   ▼
              ╱ Proceeds ╲      NO      ╱   LED    ╲     NO
             ╱     ?      ╲────────────▶╲  flashing ╲──────────────┐
              ╲          ╱               ╲    ?     ╱               │
                 │ YES                     │ YES                    │
                 │                         │                        │
                 ▼                         ▼                        ▼
         ┌──────────────┐          ┌──────────────┐        ┌──────────────┐
         │ LED displays │          │ LED flashing │        │ LED display  │
         │    ".1"      │          │    ".0"      │        │ stuck at ".0"│
         └──────────────┘          └──────────────┘        └──────────────┘
                 │                         │                        │
                 ▼                         ▼                        ▼
                 │                  (  Replace   )          (  Replace   )
                 │                  ( Enhanced   )          ( Enhanced   )
                 │                  (  MMP40 EC  )          (  MMP40 EC  )
                 ▼
              ╱ Proceeds ╲      NO      ╱   LED    ╲     NO
             ╱     ?      ╲────────────▶╲  flashing ╲──────────────┐
              ╲          ╱               ╲    ?     ╱               │
                 │ YES                     │ YES                    │
                 │                         │                        │
                 │                         ▼                        ▼
                 │                  ┌──────────────┐        ┌──────────────┐
                 │                  │ LED flashing │        │ LED display  │
                 │                  │    ".1"      │        │ stuck at ".1"│
                 │                  └──────────────┘        └──────────────┘
                 ▼                         │                        │
               ( B )                       ▼                        ▼
                                    (  Replace   )          (  Replace   )
                                    ( Enhanced   )          ( Enhanced   )
                                    (  MMP40 EC  )          (  MMP40 EC  )
```
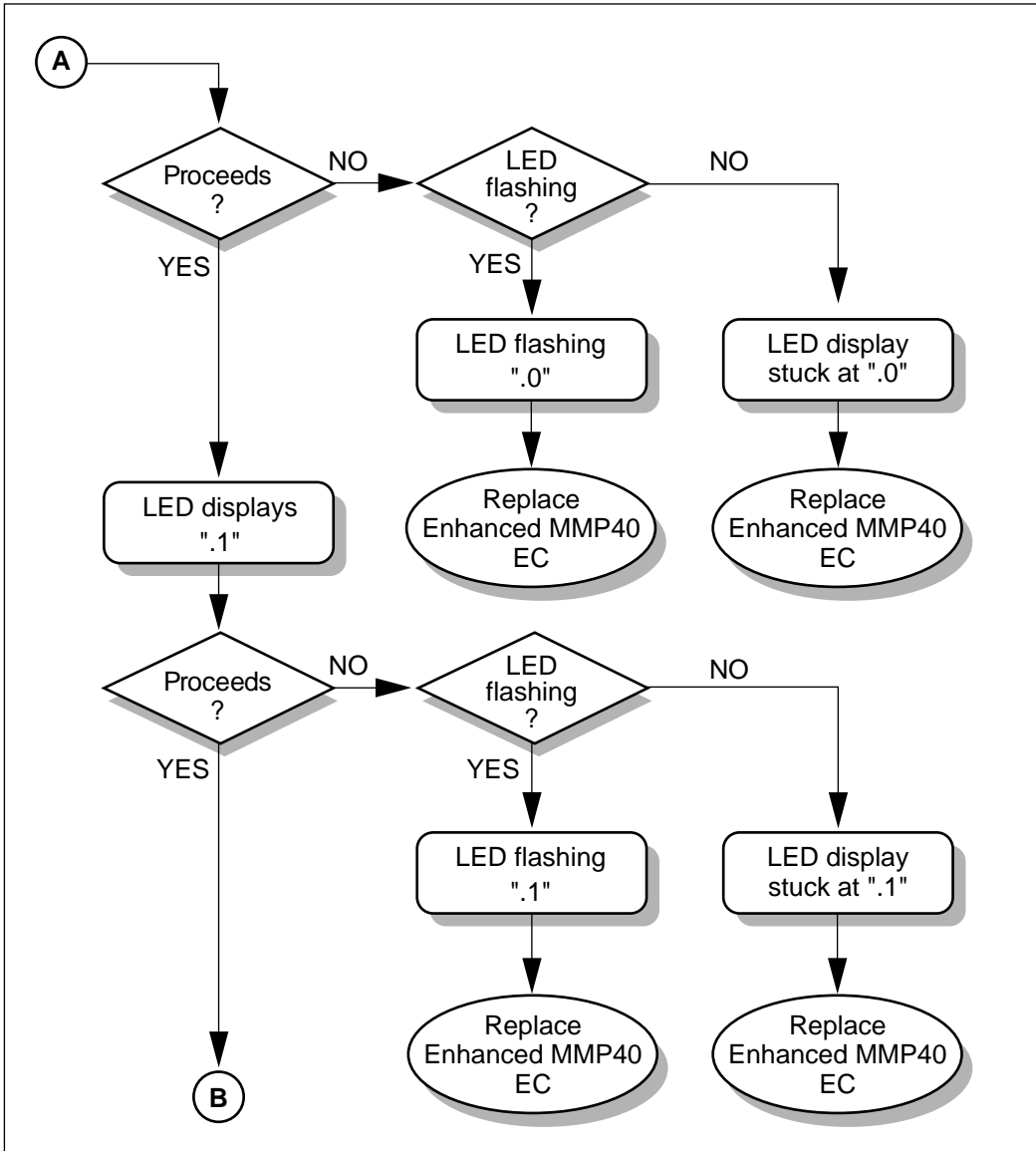
G100425/B

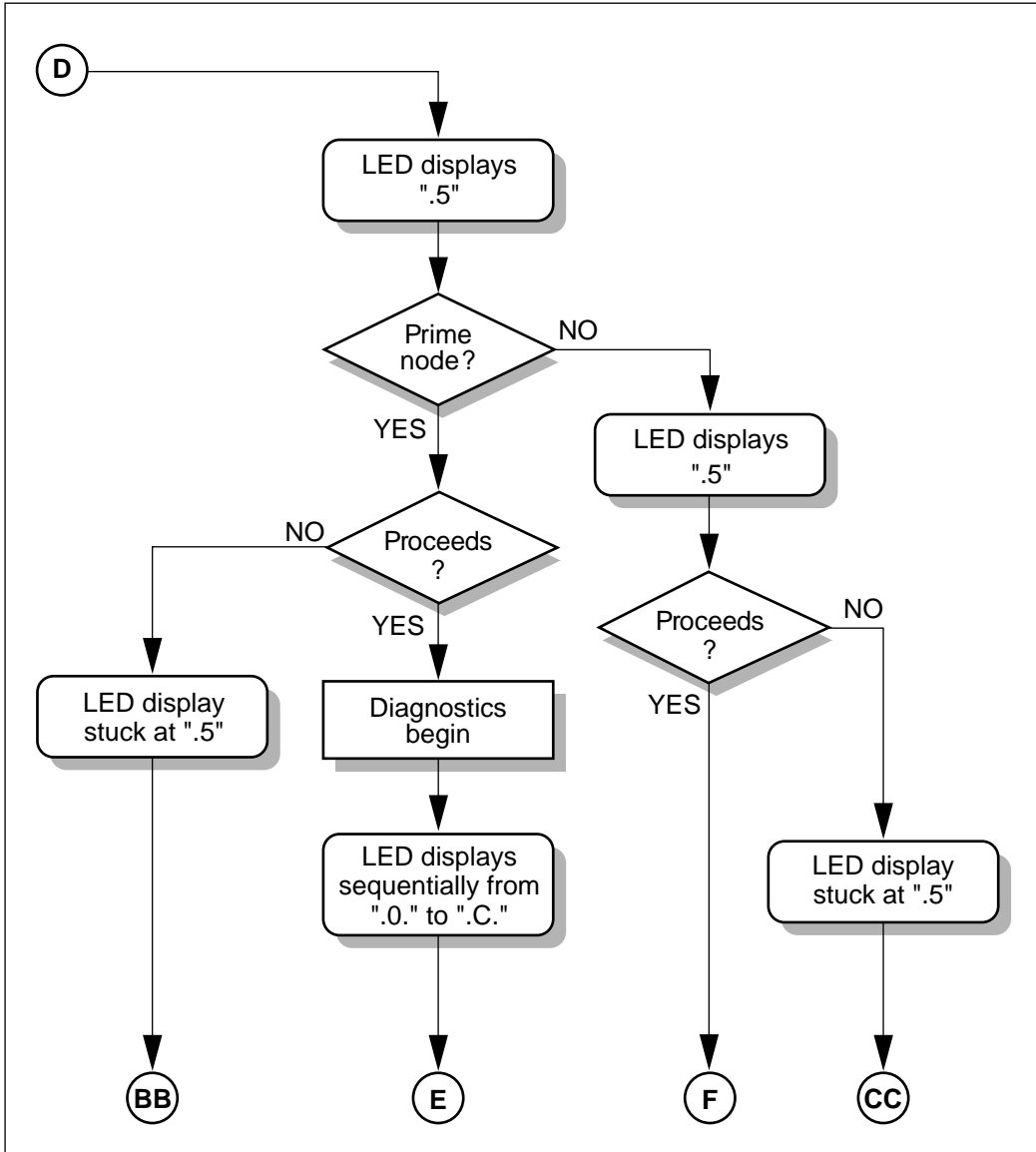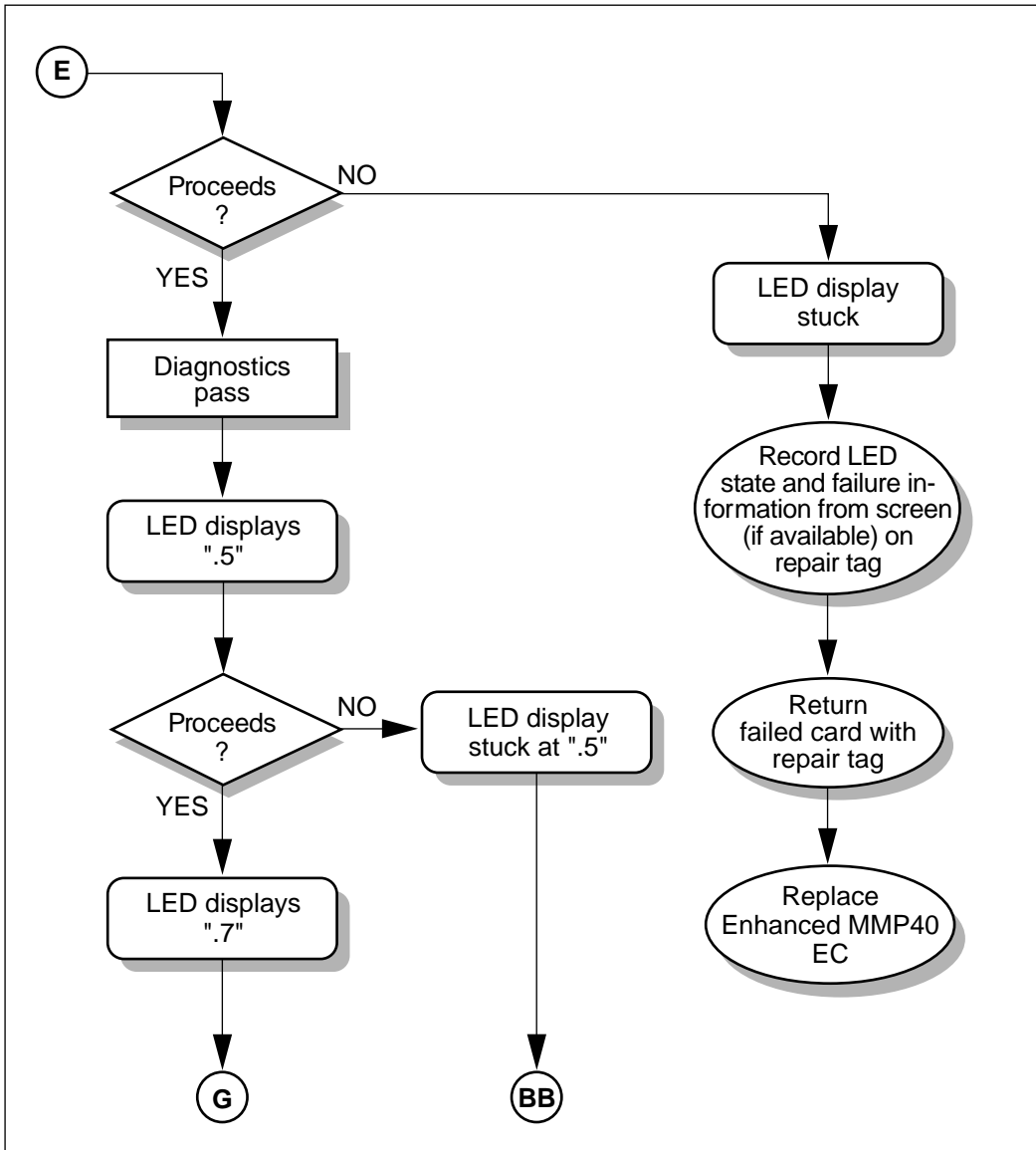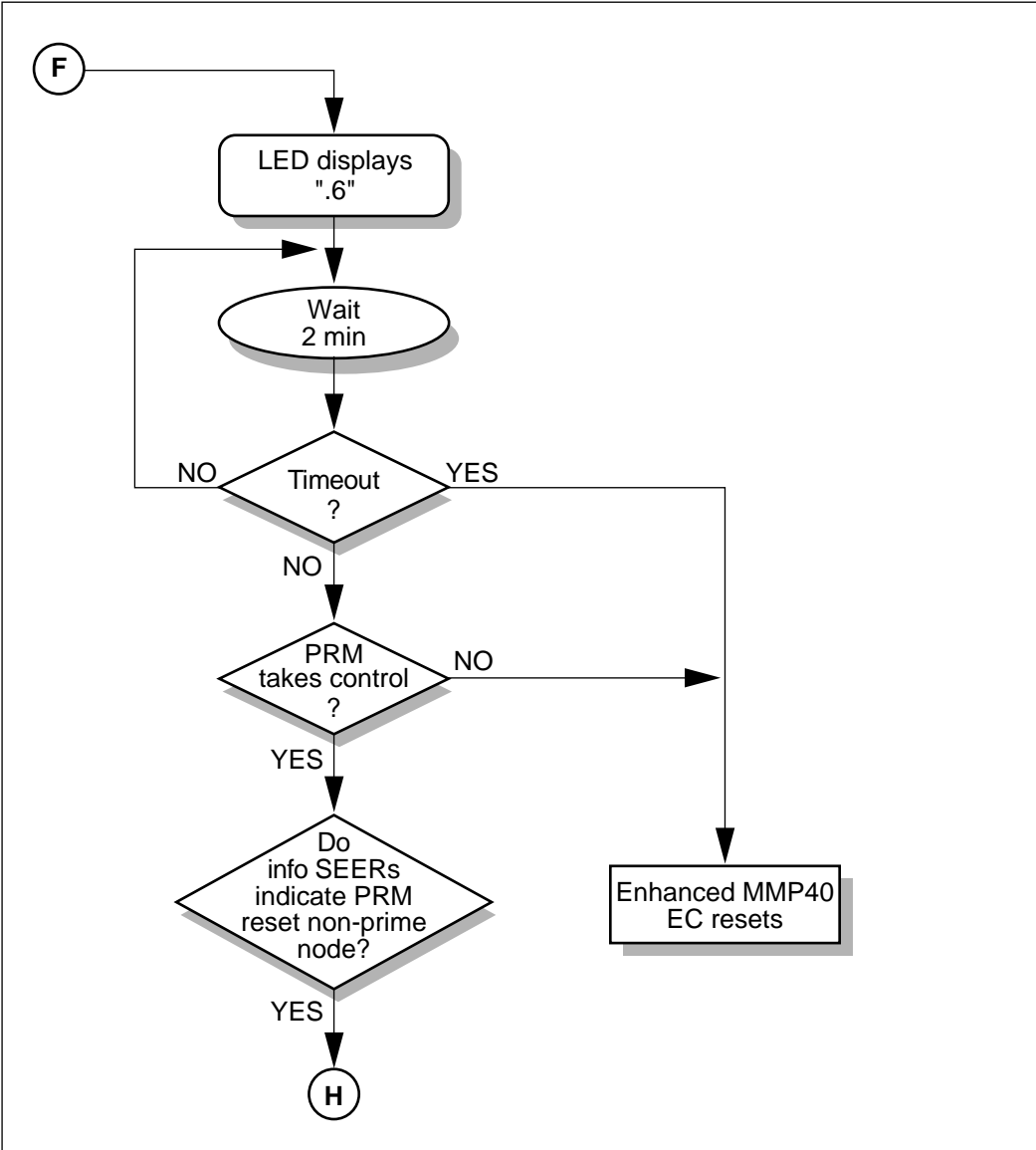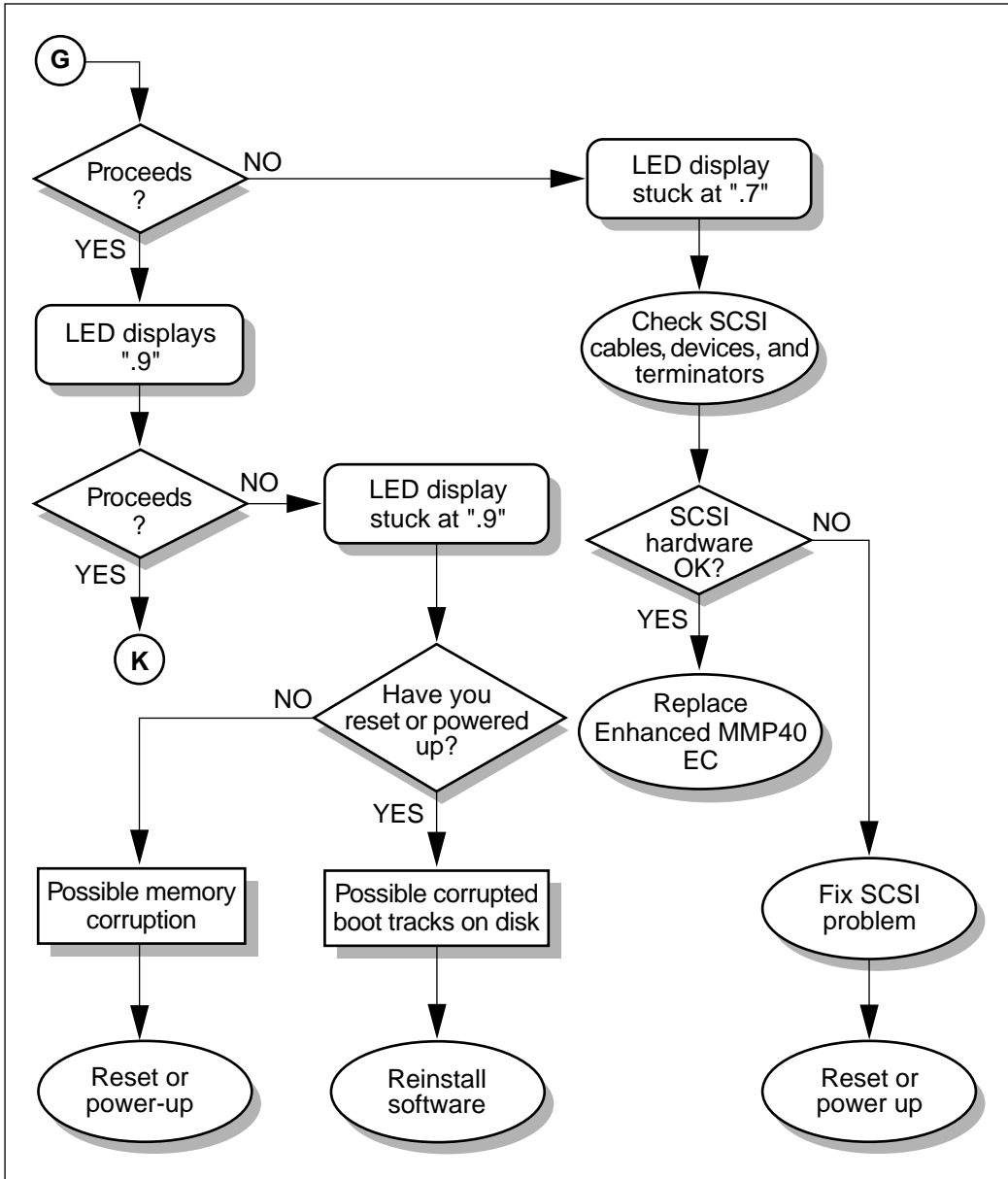## Flowcharts (continued)

G100425/C

Flowcharts (continued)

G100425/D

Flowcharts (continued)

```
D

        LED displays
        ".5"

        Prime        NO
        node?
                           LED displays
        YES                ".5"

NO      Proceeds
        ?
                           Proceeds    NO
        YES                ?

LED display   Diagnostics  YES
stuck at ".5" begin
                                       LED display
        LED displays                   stuck at ".5"
        sequentially from
        ".0." to ".C."

BB      E            F     CC
```

G100425/E

Flowcharts (continued)

G100425/F

Flowcharts (continued)

```
    F ─────────────────┐
                        │
                        ▼
              ┌──────────────────┐
              │  LED displays    │
              │     ".6"         │
              └──────────────────┘
                        │
         ┌──────────────┤
         │              ▼
         │        ╭──────────────╮
         │        │    Wait      │
         │        │    2 min     │
         │        ╰──────────────╯
         │              │
         │              ▼
    NO   ◇ Timeout ◇  YES ──────────────────┐
         │    ?                              │
         │ NO                                │
         ▼                                   │
    ◇   PRM      ◇  NO ──────────────────┐   │
    takes control                        │   │
         ?                               │   │
      YES │                              ▼   ▼
          ▼                    ┌──────────────────┐
    ◇   Do       ◇            │  Enhanced MMP40  │
     info SEERs               │   EC resets      │
    indicate PRM              └──────────────────┘
    reset non-prime
      node?
      YES │
          ▼
          H
```

G100425/G

Flowcharts (continued)

G100425/H

Flowcharts (continued)

```
                              ┌───┐
                              │ H │────────────────────┐
                              └───┘                     │
                                                        ▼
                                            ╱◇╲
                                  NO     ╱  Does  ╲    YES      ┌──────────────┐
                              ┌─────────◇ PRM require ◇────────▶│  Diagnostics │
                              │          ╲ diagnostics?╱        │    begin     │
                              ▼             ╲◇╱                  └──────────────┘
                         ╱◇╲                                           │
                       ╱ Proceeds ╲    NO                              ▼
                      ◇    ?      ◇──────────┐              ┌──────────────────┐
                       ╲        ╱            │              │   LED displays   │
                         ╲◇╱                 │              │ sequentially from│
                   YES    │                  │              │  ".0." to ".C."  │
                          ▼                  ▼              └──────────────────┘
              ┌──────────────────┐  ┌──────────────┐                │
              │ PRM tries to load│  │  LED display │                ▼
              │  non-prime node  │  │ stuck at ".6"│        YES   ╱◇╲    NO
              └──────────────────┘  └──────────────┘      ┌──────◇Proceeds◇──────┐
                       │                    │             │       ╲  ? ╱         │
                       ▼                    ▼             ▼         ╲◇╱           ▼
              ┌──────────────────┐       ┌────┐    ┌──────────────┐    ┌──────────────┐
              │ LED displays ".8"│       │ DD │    │  Diagnostics │    │  LED display │
              │ on non-prime node│       └────┘    │     pass     │    │    stuck     │
              └──────────────────┘                 └──────────────┘    └──────────────┘
                       │                                  │                   │
                       ▼                                  ▼                   ▼
                 ╱◇╲     NO                          (Enhanced MMP40    (Record LED
               ╱ Proceeds ╲──────────┐                EC resets)         state and failure in-
              ◇    ?      ◇          │                                   formation from screen
               ╲        ╱            │                                   (if available) on
                 ╲◇╱                 │                                   repair tag)
           YES    │                  │                                         │
                  ▼                  ▼                                         ▼
        ┌──────────────┐    ┌──────────────┐      (Replace          (Return
        │ LED displays │    │  LED display │       Enhanced MMP40 ◀── failed card with
        │     ".9"     │    │ stuck at ".8"│       EC)                repair tag)
        └──────────────┘    └──────────────┘
               │                   │
               ▼                   ▼
            ┌───┐               ┌────┐
            │ J │               │ DD │
            └───┘               └────┘
```

G100425 / I

Flowcharts (continued)

```
      ( J )───────────────┐
                          ▼
                    ◇ Proceeds ? ◇──── NO ───►  LED display
                          │                      stuck at ".9"
      ( K )────────►  YES │                           │
                          ▼                           ▼
                    LED displays                   ( DD )
                    "1", "2", "3", "4"
                    in sequence
                          │
                          ▼
                    ◇ Proceeds ? ◇──── NO ──────────┐
                          │                         │
                      YES │                         ▼
                          ▼                     LED display
                    Node is                     stuck
                    out of service                  │
                          │                         ▼
                          ▼                     Record
                    LED displays               LED state and
                    "C"                        information from
                          │                    screen and
                          ▼                    printer
                    Application                    │
                    programs loading               ▼
                          │                    Refer to Chapter 16
                          ▼                    "Troubleshooting
                        ( L )                  startup problems"
```

G100425/J

Flowcharts (continued)
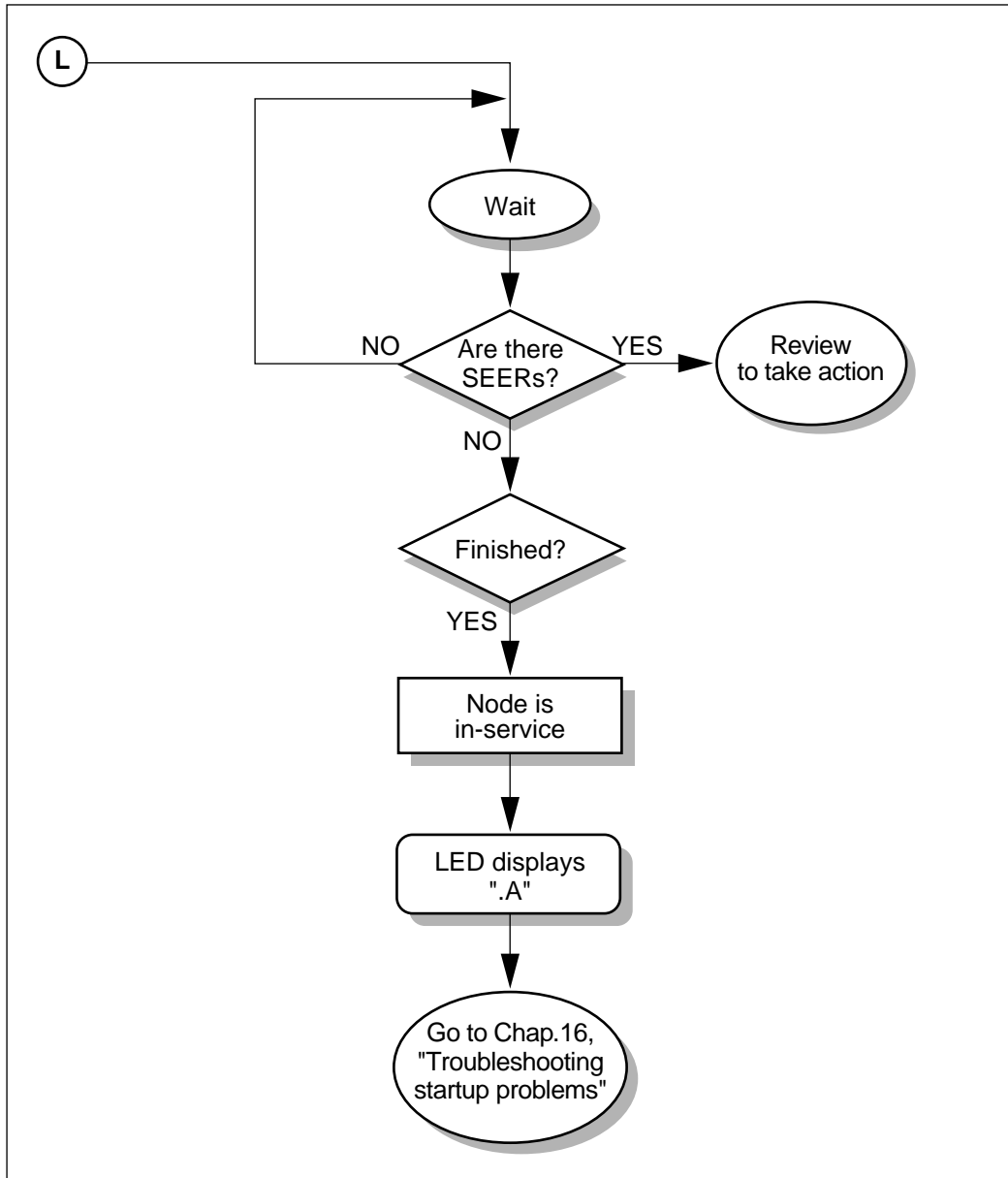
G100425/K

AA—LED stuck at ".4"

Possible causes	Recovery action
Ctrl-B or the BREAK key was pressed, or terminal was powered up during startup sequence.	Reset or power up the node again.
A peripheral card such as a VP or Utility card on the same node is faulty.	Replace the faulty card.
The Enhanced MMP40 (or MMP40) card may be faulty.	Record the messages on the screen. Replace the Enhanced MMP40 (or MMP40) card.

BB—LED stuck at ".5" (prime node)

Possible causes	Recovery action
Ctrl-B or the BREAK key was pressed, or the terminal was powered up during the startup sequence.	Reset or power up the node again.
Enhanced MMP40 (or MMP40) card may be faulty.	Record the messages on the screen. Replace the Enhanced MMP40 (or MMP40) card.

CC—LED stuck at ".5" (non-prime node)

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

DD—LED stuck at ".6", ".8", or ".9" (non-prime node)

Possible causes	Recovery action
The prime node Enhanced MMP40 (or MMP40) may be faulty.	Record the LED state and any SEERs. Replace the prime node Enhanced MMP40 (or MMP40).
The Enhanced MMP40 (or MMP40) card on non-prime node may be faulty.	Record the LED state and any SEERs. Replace the non-prime node Enhanced MMP40 (or MMP40).
The utility card may be faulty.	Replace the faulty card.

Appendix D

CSQI, CSQO, and call register settings

In this appendix

Call registers

Introduction

Each message sent on the command and status link (CSL) requires a call register. Call registers are used whenever

- A caller presses a key while logged on to Meridian Mail.
- A call is transferred from or to Meridian Mail.
- A call hangs up from Meridian Mail.
- A message waiting indication (on or off) is sent.

Set the number of call registers

Introduction
Use the following calculations to determine the value for the number of call registers (NCR), and adjust the NCR to that value. These calculations must be performed before CSQI and CSQO are set. Also perform these calculations when changes to the values in the formula occur, that is, lines, trunks, ACD ports, and so on. Call registers are always site-specific. Do not assume that the correct setting for any one site will work at another apparently similar site.

Do not change CSQI or CSQO unless you calculate the required NCR with the following formulas. It must be noted that the system default values are minimal and set only high enough to bring the system up at time of installation.

CAUTION
Risk of harming the level of service

If you are not familiar with this procedure, consult with an experienced Meridian 1 or SL1 technician before proceeding. This procedure will affect the level of service on the Meridian 1 or SL1. Whether the effect is positive or negative depends on a thorough knowledge of X11 software.

NCR formulas
There are two NCR formulas: one for loop traffic greater than 3000 centi-call seconds (CCS), and one for loop traffic less than 3000 CCS. The following NCR formula elements and the formulas themselves, are taken from NTP 553-3001-149.

Assumptions
- The call register traffic factor = 1.865.
- The formula for calculating recommended NCRs depends on the traffic load for the system.
- There are 28 CCS per ACD trunk.

Calculations

- Call register memory size (MS) = recommended number of call registers $\times$ MS per call register.
- Snacd = numbers of calls overflowed to all target ADS DNs x 2.25 – number of calls overflowed to local target ACD DNs x 1.8 (0, if the system is not a source node).
- Tnacd = $0.2 \times$ number of expected calls overflowed from source (0, if the system is not a target node).
- ISDN CCS = PRI CCS + BRI CCS

ISDN penetration factor

- p = ISDN CCS / total voice loop traffic
- ISDN factor = $(1 - p)^2 + (1 - p)$ x $p + 3 \times p^2$

If total voice loop traffic > 3000 CCS, then
Recommended number of call registers = $(0.04 \times$ total voice loop traffic + $0.18 \times$ number of ACD incoming trunks + Snacd + Tnacd + 25$) \times$ ISDN factor

If total voice loop traffic < 3000 CCS, then
Recommended number of call registers = (number of system-equipped ports – number of ACD incoming trunks – number of ACD agent sets) $\times$ 0.94 + number of ACD incoming trunks + Snacd +Tnacd $\times$ ISDN factor

Default call registers   Typically, the number of call registers for systems running Release 20 or 21, after install and before the calculations are performed, are as follows:

Machine type - Release 20/21	NCR value
Option 11	80
Option 11C	2047
Option 11E	402
Options 51 and 61	1000
Option 71	2000
Option 81	3500

CSQI/CSQO

Introduction　　　　The typical settings for CSQI and CSQO are two times the number of Voice Mail agents, not to exceed 25 percent of the call registers, or a maximum of 255 each. However, when the "$2 \times$ the voice mail agent" method is used, there may not be enough call registers to support the needs of Meridian Mail or the PBX. This is especially true if the site has frequent use of large distribution lists, or if broadcast messages are sent frequently.

Also, the practice of setting the numbers for CSQI and CSQO up to 255, and the NCR to approximately $4 \times$ that (1024), without doing any calculations, means that the Meridian 1 or SL1 system may not be engineered properly.

Correcting delayed or　To correct the problem causing delayed or undelivered message
undelivered MWI　　waiting indicator (MWI), follow these steps.

Step	Action
1	Set the NCR according to "NCR formulas" on page D-3.
2	Determine the potential number of registers:

a. Subtract 3000 words from the free UDATA to allow for incidental usage.

b. Divide the remainder of the free UDATA by the number of words per call register required for the specific PBX software release. This will give the value, for additional NCR, that can be added to the system. See the following table for the appropriate number of words per call register:

Number of words per call register by release	
Release	**Words per call register**
19	103
20.19	158
20.22 and later	161
21	165

Step	Action
3	Use these values to calculate CSQI/CSQO.
	a. If the determined value is greater than 510, then set the CSQI and CSQO to 255 each and increase the NCR by 510. **Example:** If the total number of additional registers available comes to 600, then set CSQI and CSQO to 255 each and increase the NCR by 510.
	b. If the determined value is less than 510, then set CSQI and CSQO accordingly. Each is half of the total. **Example:** If the total number of additional registers available comes to 400, then set CSQI and CSQO to 200 each and increase the NCR by 400.

Notes:

1. If there are no memory constraints on the Meridian 1 (or SL1), then the NCR can be set higher than the calculations.

2. If the values are too tight (that is, the system is left with only 3000 words of free UDATA), you may have problems when making changes to the PBX system. The values of NCR, CSQI, and CSQO may have to be adjusted until a good compromise is found.

3. Link and CCR also use CSQIs, CSQOs, and call registers. The documentation on Link and CCR should be used if those platforms are installed at the site.

4. The higher the number of call registers, the longer the system takes to initialize.

For more information, contact your local Nortel Networks technical support group.

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Reader Response Form

Meridian Mail Modular Option EC 13
Installation and Maintenance Guide
555-7061-250

Tell us about yourself:

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Company: _____

Address: _____

_____

Occupation: _____ **Phone:** _____

1. What is your level of experience with this product?

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2. How do you use this book?

   ☐ Learning   ☐ Procedural   ☐ Reference   ☐ Problem solving

3. Did this book meet your needs?

   ☐ Yes   ☐ No

   If you answered No to this question, please answer the following questions.

4. What chapters, sections, or procedures did you find hard to understand?

   _____

   _____

5. What information (if any) was missing from this book?

   _____

   _____

6. How could we improve this book?

   _____

   _____

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