

555-7051-200

Meridian Mail Modular Option GP

Site and Installation Planning Guide

Product release 13

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Meridian Mail Modular Option GP

Site and Installation Planning Guide

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Introduction

This document helps you prepare for Meridian Mail installation. By following the guidelines described here, you can determine the best size and location for your system. Worksheets and checklists are provided to aid you in planning your Meridian Mail installation.

Information about and specifications for the installation of a Meridian 1 switch are included in this document where they pertain to Meridian Mail installation.

Who should use this document

If you are involved in planning for the installation of Meridian Mail at your site, then you should read this document.

How this document is organized

This document is organized into five chapters and five appendices:

- Chapter 1, “Determining system size,” shows you how to determine the number of ports and size of the disk (storage hours) required for your site.
- Chapter 2, “Selecting a site,” examines the factors involved in selecting a site.
- Chapter 3, “Preparing for installation,” identifies the items required before you can install Meridian Mail.
- Chapter 4, “Web server setup,” provides information on the system, software, and PC requirements to set up a web server for web-based PC applications.
- Chapter 5, “Planning spares requirements,” lists documents that may be of value during the site planning and preparation process.
- Appendix A, “Reference documents,” lists various documents that may be of value while planning and preparing your site.
- Appendix B, “Component list,” identifies all the components that can be ordered individually.
- Appendix C, “Cable and wiring plan,” provides a worksheet to list cables and wiring.
- Appendix D, “Site survey checklist,” provides a worksheet to list the features of your site.
- Appendix E, “Data forms and site log form,” provides data entry forms that help in the planning and configuration of Meridian Mail.

NTP references

References to the *System Administration Guide*, the *Installation and Maintenance Guide*, the *System Installation and Modification Guide*, and the *Network Planning Guide* that appear in this guide may be found in the following books:

- *System Administration Guide* (NTP 555-7051-307) for a single-customer system
- *System Administration Guide for Multi-Customer Systems* (NTP 555-7051-308)
- *Meridian Mail Modular Option GP Installation and Maintenance Guide* (NTP 555-7051-250)
- *System Installation and Modification Guide* (NTP 555-7001-215)
- *Networking Planning Guide* (NTP 555-7001-241)

Chapter 1

Determining system size

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Overview

Introduction

This chapter outlines how to estimate the number of ports, nodes, and hours of storage your system will require, based on the estimated system usage. The methods for determining port and storage hours requirements are broken down by feature. You can ignore the procedures for those features that you do not plan to have on your system.

A term used in this chapter that you need to know is *multimedia applications*. This term refers to Meridian Mail services or features that include fax capability. For example, a voice menu that allows a caller to select a fax to receive is a multimedia application.

Basic-service, full-service, and multimedia ports

Introduction

The following port types and capabilities are available:

- Basic-service voice
- Full-service (voice and multimedia)

Note 1: Basic-service multimedia ports are not available.

Note 2: In some regions, Nortel Networks no longer sells full-service multimedia ports. Instead, two full-service ports are used to configure one multimedia port.

To determine how many ports are required for both multimedia and voice services, you will need to do the following (detailed instructions are provided later in this chapter):

- Determine how many ports are required for multimedia services.
- Determine how many full- and basic-service ports are required for voice services.
- Calculate the total number of ports as follows:
(Multimedia × 2) + full- and basic-service = total ports

Example

If five multimedia ports and six full-service voice ports are required, purchase
(5 × 2) + 6 = 16 full-service ports

Note: The total should be evenly divided by four since ports are provided on voice processor cards in multiples of four. If it cannot be divided evenly by four, add more basic-service ports until it is.

- Reconfigure ten full-service ports as five multimedia ports.

The port type (voice versus multimedia) and capability (basic versus full) determine the features that can be processed by that port. You can have a mixture of port types and capabilities on your system depending on the requirements of your site. This

flexibility allows your organization to purchase a lower-cost system (basic ports are less expensive than full-service).

The Meridian Mail features that are supported by basic-service and full-service ports are listed below. Note the following:

- Features requiring a multimedia port are listed in the Full-service column with an asterisk beside them.
- Features supported by basic-service ports are also supported by full-service ports.

Basic-service	Full-service
ACC ICL Enable Option	VM Voice Messaging
AS Announcement Service	EM Express Messaging
MS Voice Menu Service	AN AMIS Networking Agent
PM Prompt Maintenance	DNU Delivery to Non-User
RA Remote Activation	RN Remote Notification
TD Time-of-Day Service	GS Greetings Services
TS Thru-Dial Service	VF Voice Forms Service
VS Voice Softkey	TR Transcription Service
	NW Meridian Networking
	*FOC Fax Outcalling
	Plus all basic services

Note 1: Fax Outcalling (FOC) or Fax on Demand includes

- same call fax delivery (caller receives faxes during same call)
- fax callback (caller specifies a fax number for the fax delivery)
- fax information service (similar to voice announcements, except a fax is delivered instead of a voice message)
- fax item maintenance (allows the storage and updating of fax items used in Fax on Demand applications)

Note 2: Voice menus or announcements with fax items can run on full-service voice ports as long as the caller is required to enter a fax callback number. With this type of setup, only the fax delivery (fax callback) requires a multimedia port. This option reduces the number of multimedia ports required. Refer to “Number of multimedia ports required” on page 1-18 for more details.

If you are going to have a mixture of port types and capabilities, or both, then you must determine how many of each port type and capability your system will require (that is, how many basic-service voice, full-service voice, and multimedia ports are required).

Calculating the number of ports required—overview

To determine the number of basic-service ports, first consider which required services need basic-service ports (for example, ICL or IVR). Then refer to “Determining the number of voice ports required” on page 1-7 for instruction on estimating traffic requirements for those applications (features). Follow only those procedures that refer to applications or features that you plan to process through basic-service ports. Use those estimates to determine the number of basic-service voice ports required.

To determine the number of full-service voice ports, first consider which required services need full-service voice ports. Then refer to “Determining the number of voice ports required” on page 1-7 for instruction on estimating traffic requirements for those applications (features). Use those estimates to determine the number of full-service voice ports required.

When you have determined the number of basic-service and full-service voice ports required, add the totals to determine the total number of voice ports required.

To determine the number of multimedia ports required, refer to “Number of multimedia ports required” on page 1-18 for instruction on estimating traffic requirements for fax-related features. Follow only those procedures that refer to applications (features) you plan to process through multimedia ports (such as voice menus that have fax items for same call delivery). Use those estimates to determine the number of multimedia ports required.

Then refer to “Total number of voice and multimedia ports required” on page 1-28 to determine the system size required.

ACD queue requirements

If you are going to have a mixture of port types and capabilities, or both, then you must set up a separate ACD queue for each group of ports. After you determine the number of ports required of each type and capability you must plan which ports should be linked to which queue.

Determining the number of voice ports required

The number of ports on a system determines the maximum number of users who can use the system and its features at the same time. For example, an eight-port system allows up to eight users to use Meridian Mail at the same time. However, since it is unlikely that all users will try to access their mailboxes simultaneously, each port normally supports a large number of users.

Port requirements are determined using standard traffic engineering principles. These consider busy hour (BH) traffic and desired grade of service. The busy hour is the highest traffic hour for the system.

Traffic capacity is stated in BH CCS (busy hour centi [hundred] call seconds), and is calculated by adding up the total call seconds (connect time) during the busy hour and dividing by 100.

$$\text{CCS} = \frac{\text{Total call seconds}}{100 \text{ seconds}}$$

When calculating busy hour traffic, keep in mind that, for a typical business, the busy hour usually occurs between 10:00 a.m. and 11:00 a.m. or between 2:00 p.m. and 3:00 p.m. on weekdays. For individual businesses, the busy hour period may vary.

Furthermore, your busiest hour or peak period may not occur each day. Your peak period may occur only on certain days of the week or month, or only during certain months of the year (especially if your business is seasonal in nature). Consider these ideas when judging what hour in the week, month, or year is your busy hour. You must be aware of these factors to engineer a system that can truly handle your peak traffic requirements.

Steps for determining the number of voice ports

The steps for determining the number of voice ports required for your organization are listed briefly and then explained in more detail in the procedures that follow. A worksheet on page 1-9, “Worksheet for calculating busy hour activity and the number of voice ports required,” helps you perform the required calculations. The steps are as follows:

Step	Action
1	Determine the busy hour voice messaging activity (connect time). For instructions, see “Calculating the busy hour messaging activity” on page 1-11.
2	Determine the busy hour activity of all Meridian Mail applications used by your organization. For instructions, see “Calculating the total busy hour activity” on page 1-12.
3	Determine the increase in activity that networking will cause if that feature has been purchased. For instructions, see “Calculating the networking activity” on page 1-13. For more information on planning for networking, see the <i>Networking Planning Guide</i> (NTP 555-7001-241). If networking has not been purchased, then skip this step.
4	Estimate the increase in activity that outcalling will cause if that feature has been purchased. For more information, see “Determining how your organization will use Outcalling” on page 1-14. If outcalling has not been purchased, then skip this step. Calculate the number of ports required. For instructions, see “Calculating the number of voice ports required” on page 1-15.

Worksheet for calculating busy hour activity and the number of voice ports required

Note: If you plan to use dedicated ports for particular applications, calculate these port requirements separately, and then insert this value in box 14 on the next page.

Busy hour system activity and ports required		Basic-service voice activity (Call- seconds)	Full-service voice activity (Call- seconds)
1	Voice Messaging activity (see “Calculating the busy hour messaging activity” on page 1-11)	1	
2	Activity of all applications (see “Calculating the total busy hour activity” on page 1-12)		
	Voice Menu activity	2a	
	Note: Voice menus with fax items for callback delivery must be on full-service voice ports. Refer to “Fax callback activity” on page 1-23. Other voice menus require only basic-service ports.		
	Announcements activity	2c	
	Voice Forms activity		2d
	ICL applications activity	2e	
	Auto Attendant activity (if used during the busy hour)	2g	
3	Networking activity (if installed and not dedicated) (see “Calculating the networking activity” on page 1-13)		
4	Outcalling activity (if installed and not dedicated) (see “Outcalling activity” on page 1-14)		
5	Add each column	5a	5b

— continued —

Busy hour system activity and ports required

6 Number of voice ports required (see “Calculating the number of voice ports required” on page 1-15)

a. Copy the basic-service total from box 5a on the previous page. **6**

--

b. Divide the figure in box 6 by 100 to determine the total basic-service busy hour activity in CCS. **7**

--

c. Look up the CCS (box 7) in “Port capacity” on page 1-16 to determine the number of non-dedicated basic-service voice ports required. **8**

--

d. Copy the full-service total from box 5b on the previous page. **9**

--

e. Divide the figure in box 9 by 100 to determine the total full-service busy hour activity in CCS. **10**

--

f. Look up the CCS (box 10) in “Port capacity” on page 1-16 to determine the number of non-dedicated full-service voice ports required. **11**

--

g. Number of ports dedicated to Meridian Networking (obtain assistance from a traffic engineer). **12**

--

h. Number of ports dedicated to Outcalling (obtain assistance from a traffic engineer). **13**

--

i. Number of voice ports dedicated to or required for other specialized services (see step 7 in “Calculating the number of voice ports required” on page 1-15). **14**

--

j. Total number of voice ports required (add lines 8 and 11 through 14). **15**

--

7 To determine the minimum number of nodes required, look up the value from box 15 in “Node configurations” on page 1-41. If you are planning to have multimedia ports, wait until the multimedia port requirements have been calculated before determining the number of nodes required.

— end —

Voice messaging activity

The busy hour voice messaging activity (connect time) is the anticipated activity of Meridian Mail during the busy hour.

To determine the busy hour voice messaging activity, use “Calculating the busy hour messaging activity” below, then record the result in box 1 of “Worksheet for calculating busy hour activity and the number of voice ports required” on page 1-9. For a sample calculation, see “Busy hour messaging activity calculation example” below.

Calculating the busy hour messaging activity

Step Action

- 1 Estimate the average connection time per registered user during the busy hour.
This includes both the time the user is logged on to Meridian Mail and the time callers use to leave messages for that user.
The normal range is 30 to 60 seconds per user. A reasonable assumption is 40 seconds per user.
- 2 Determine the number of Meridian Mail users.
- 3 Multiply the result of step 1 by the result of step 2.
- 4 Record the result in box 1 of “Worksheet for calculating busy hour activity and the number of voice ports required” on page 1-9.

Busy hour messaging activity calculation example

Average connection time (seconds)	x	Number of Meridian Mail users	=	Total seconds of voice messaging activity
40		1000		40 000
CCS = Total call seconds/100 = 400				

Activity of all applications

Applications that use voice ports include Voice Menus, Auto Attendants, Voice Forms, and Meridian ICL applications. It is important to analyze your specific applications, since many

applications vary widely in the number of calls requiring processing and in the holding times of those calls.

Also, an application can use a shared port or a dedicated port. If you plan to use shared ports for applications, then add the applications' estimated activity to the requirements for Voice Messaging (see "Calculating the number of voice ports required" on page 1-15).

The section "Configuring ACD queues on the Meridian 1" in the "Voice administration" chapter of the *System Administration Guide* discusses reasons for and against dedicating ports and how to configure dedicated ports.

To determine the total busy hour activity generated by Meridian Mail applications on shared ports, use "Calculating the total busy hour activity" below. For a sample calculation, see "Busy hour applications activity calculation example" on page 1-13.

Calculating the total busy hour activity

Note: Include the Auto Attendant application only if you plan to use it during peak hours.

Step	Action
1	Estimate the average length of a call during the busy hour. The average length is determined by the type of application. For an information-type menu, a reasonable assumption is 60 seconds per call. An automated attendant will have a much smaller average call length.
2	Estimate the number of calls during the busy hour.
3	Multiply the result of step 1 by the result of step 2. The result is the estimated busy hour activity for that particular application.
4	Record the total.
5	Repeat steps 1 through 4 for each application item (that is, voice menu, announcement, or voice form).
6	Record the result in the appropriate step 2 box of "Worksheet for calculating busy hour activity and the number of voice ports required" on page 1-9.
7	Repeat steps 1 through 6 for each application.

Busy hour applications activity calculation example

Voice application	Average length of call (seconds) x	Number of calls per hour =	Total call seconds for applications
Voice Menu 1	60	40	2400
Voice Menu 2	90	10	900
Voice Menu 3	30	10	300
Subtotal (recorded in box 2a or 2b on page 1-9)			3600
Announcement 1	40	5	200
Announcement 2	30	10	300
Subtotal (recorded in box 2c on page 1-9)			500
Voice Form 1	200	10	2000
Voice Form 2	220	10	2200
Subtotal (recorded in box 2d on page 1-9)			4200
Auto Attendant (if used during busy hour) (recorded in box 2g of Figure 2-1)	20	60	1200
Total			9500
CCS = Total call seconds/100 = 95			

Networking activity

Networking ports can be shared with other applications or dedicated. If the ports are shared, add this networking traffic estimate to the traffic estimates for other applications.

To determine the networking activity for shared ports, use “Calculating the networking activity,” described on this and the next page. A typical assumption is that networking traffic will increase overall voice messaging traffic by five percent. For more information on planning for networking, see the *Networking Planning Guide* (NTP 555-7001-241).

Calculating the networking activity

Note: If you plan to dedicate ports to Networking (so that you can control the grade of service and caller access, although port usage will be less efficient), you will need to obtain assistance from a traffic engineer. The result is recorded in box 12 of “Worksheet for calculating busy hour activity and the number of voice ports required” on page 1-9.

Step	Action
1	Multiply the result in box 1 of “Worksheet for calculating busy hour activity and the number of voice ports required” on page 1-9 by .05.
2	Record the result in box 3 of “Worksheet for calculating busy hour activity and the number of voice ports required” on page 1-9.

Outcalling activity

Outcalling (which collectively refers to the Remote Notification and Delivery to Non-Users features) can be used in different ways by different organizations, so port requirements will vary from one organization to the next. You must consider how your organization will use Outcalling, especially during the busy hour. See the following table.

Determining how your organization will use Outcalling

IF	THEN
only a small number of users will be using Delivery to Non-Users and Remote Notification	the effect of these features on your overall system requirements will be small and can be ignored at this point.
the Delivery to Non-Users feature will to be restricted to low-traffic periods (for example, after-hours)	the feature should have no impact on your system requirements.
a large number of users will be accessing Delivery to Non-Users and/or Remote Notification	estimate what the usage will be in CCS and record it in box 4 on page 1-9.
ports are going to be dedicated to the Outcalling feature	you will need to obtain assistance from a traffic engineer to calculate the port requirements for outcalling. The result is recorded in box 13 of Figure 1-1.

Calculating the number of voice ports required

Step	Action
1	Copy the figure from box 5a on the first page of "Worksheet for calculating busy hour activity and the number of voice ports required" on page 1-9 into box 6 on the second page.
2	Divide box 6 by 100 to get the total busy hour system activity in CCS. Record the result in box 7.
3	Copy the figure from box 5b on the first page of "Worksheet for calculating busy hour activity and the number of voice ports required" on page 1-9 into box 9 on the second page.
4	Divide box 9 by 100 to get the total busy hour system activity in CCS. Record the result in box 10.
5	For each of boxes 7 and 10, determine the number of ports required. See "Port capacity" on page 1-16. In the column labeled "Capacity of system," find the range within which the calculated total busy hour CCS falls. The corresponding value in the column labeled "Number of ports" is the number of ports required to accommodate the estimated total system activity.
6	Record the values from "Port capacity" on page 1-16 in boxes 8 and 11 respectively.
7	If you are planning to have dedicated ports for specific services, calculate the port requirements for those specific services, and record it in box 14 of "Worksheet for calculating busy hour activity and the number of voice ports required" on page 1-9. Add boxes 8 and 11 through 14 together. Record the result in box 15.

Port capacity

Note: The capacity is based on 40-second sessions and two percent of busy hour calls being queued for more than one-sixth the average hold time.

Number of ports	Capacity of system (in CCS)
4	0 to 39
8	40 to 130
12	131 to 238
16	239 to 353
20	354 to 474
24	475 to 598
28	599 to 725
32	726 to 854
36	855 to 984
40	985 to 1115
44	1116 to 1248
48	1249 to 1382
52	1383 to 1516
56	1517 to 1651
60	1652 to 1787
64	1788 to 1923

In the sample calculations shown so far in this chapter, Voice Messaging and other voice applications would generate approximately 495 CCS in the busy hour. Referring to the preceding table, you can see that to accommodate that level of traffic, you would need a 24-port system. Remember to add allowances for busy hour traffic generated by networking or outcalling, if applicable.

Operational measurements reports, available to the system administrator, provide statistics on system traffic and activity.

By monitoring these reports, the administrator can track system activity and forecast when an increase in the number of ports is necessary (for example, when the busy hour CCS exceeds your estimates).

Number of multimedia ports required

Introduction

If you are purchasing the Fax Outcalling/Fax on Demand feature (voice menu with fax items, fax callback delivery, fax announcements), your system will require multimedia ports. Each multimedia port is configured from two full-service port locations, whereas each voice port is configured from one port location. As a result, it is necessary to calculate the multimedia port requirements separately, and then convert this number to an equivalent number of full-service port locations by doubling the number of multimedia ports. This number can then be used to determine the overall system size required in terms of physical port locations.

Same call delivery versus callback delivery

The number of multimedia ports your site will require depends on how you plan to offer fax services. The options are same call delivery and callback delivery.

Same call delivery

With same call delivery, a caller who has accessed a voice menu with fax items can select and receive a fax during the same call (that is, using the same line). For this type of voice menu service, the voice menu must run on a multimedia port. Only a multimedia port can provide both the voice and multimedia services required for a voice menu with same call fax delivery.

Similarly, fax announcements that use same call delivery (caller reaches the announcement service, hears a greeting, and receives the fax in the same call) must also use a multimedia port.

To calculate the traffic requirements for a voice menu with fax items and same call delivery, refer to “Voice menus with fax items (same call delivery)” on page 1-22. To calculate the traffic requirements for a fax announcement service with same call delivery, refer to “Fax announcement (stand-alone fax service)” on page 1-23.

Callback delivery

With callback delivery, the caller who has accessed a voice menu with fax items must provide a fax number for the fax

delivery. After the caller completes the call, Meridian Mail then uses a multimedia port to deliver or send the selected fax items to the specified fax number. With this type of voice menu service, the voice menu can run on a full-service voice port.

Similarly, fax announcements that use callback delivery (caller reaches the announcement service, hears a greeting, and enters a fax callback number) only require a multimedia port for the fax delivery, not the announcement.

To calculate the	refer to the
traffic requirements for voice menus with callback delivery	section called "Determining the number of voice ports required" (see page 1-7).
requirements for the fax delivery	subsection called "Fax callback activity" (see page 1-23).
traffic requirements for a fax announcement service with callback delivery	subsection called "Fax announcement (stand-alone fax service)" (see page 1-23).

If you plan to use only the callback method to deliver fax items, you can configure a more efficient system by dedicating multimedia ports to fax callback deliveries. See "Dedicated ports for fax callback deliveries" on page 1-25 for more details.

Keep in mind that the traffic requirements you need to estimate are those requirements you anticipate during the busy hour. If you set up your system so that callback deliveries are made outside of the busy hour, then the callback traffic will not impact your busy hour calculations. However, you must ensure that busy hours for voice and multimedia are accommodated by the number of ports.

Note 1: If a voice menu or announcement provides the option of same call or callback delivery, then the number of each type of request (same call delivery or callback delivery) and the resulting traffic requirements will have to be estimated separately.

For example, if you anticipate ten voice menu calls where same call delivery is requested in the busy hour, and 15 voice menu calls where callback delivery is requested, estimate the traffic requirements for ten same call deliveries and 15 callback deliveries.

Note 2: “Worksheet for calculating the number of multimedia ports required” on page 1-21 helps you with your estimates and calculations for each step.

Worksheet for calculating the number of multimedia ports required

		Multimedia busy hour activity and ports required	
		Activity (Call-seconds)	
1	Voice menus with fax items (see "Estimating the call connect time for multimedia voice menus" on page 1-22)	1	
2	Fax callback activity (see "Estimating the total busy hour connect time for fax callback deliveries" on page 1-23)	2	
3	Fax announcement activity (same-call delivery) (see "Estimating the connect time for fax announcements with "same call" fax delivery" on page 1-24)	3	
4	Activity required to calculate the number of non-dedicated multimedia ports (see "To calculate the number of non-dedicated multimedia ports required, use the following steps." on page 1-25)	4	
Add lines 1 through 3.			
5	Divide the total by 100 to determine the total activity in CCS.	5	
6	Look up the CCS in "Port capacity" on page 1-16 to determine the number of non-dedicated multimedia ports required.	6	
7	Number of dedicated multimedia ports required (see "To calculate the number of dedicated multimedia ports required for fax callback deliveries, follow these steps." on page 1-26)	7	
8	Add lines 6 and 7.	8	

Voice menus with fax items (same call delivery)

With the Fax on Demand feature, you can set up voice menus that offer faxes as some of the menu items. These can be referred to as multimedia voice menus. A caller who reaches a multimedia voice menu can select faxes to receive. If the caller is calling from a phone line that is also connected to a fax machine, the fax can be delivered during the same call (same call delivery).

Estimating the call connect time for multimedia voice menus

To estimate the call connect time (traffic) for multimedia voice menus during the busy hour, follow these steps.

Step	Action
1	Select a multimedia voice menu and estimate the average duration of calls during the busy hour. When estimating this duration, include the following: <ul style="list-style-type: none"> time to listen to the menu greeting time to listen to the voice menu and select as many faxes as required time to receive "same call" faxing instructions time to transmit the faxes selected <ul style="list-style-type: none"> about 12 seconds to establish protocol 40 seconds per page in normal resolution; 80 seconds per page in fine resolution about 10 seconds to complete the fax delivery (that is, end protocol/disconnect)
2	Estimate the number of calls to this menu during the busy hour. This would depend on the specific function of the multimedia voice menu in your organization.
3	Multiply the result of step 1 by the result of step 2 to determine the estimated total activity generated from this multimedia voice menu during the busy hour.
4	Record the total.
5	Repeat steps 1 through 4 for each multimedia voice menu.
6	Add all the voice menu totals together and record the result in box 1 of "Worksheet for calculating the number of multimedia ports required" on page 1-21.

Fax callback activity

A voice menu with fax items may require the caller to specify a fax number to receive the selected faxes. With this type of voice menu, Meridian Mail will use a multimedia port to call the specified fax number and deliver the selected faxes.

The voice menu and fax selection part of the process can use a full-service voice port or multimedia port. Only the actual fax delivery call requires a multimedia port.

Estimating the total busy hour connect time for fax callback deliveries

To estimate the total busy hour connect time for the fax callback deliveries, follow these steps.

Note: If you want to dedicate ports to fax callback deliveries, see “Dedicated ports for fax callback deliveries” on page 1-25.

Step	Action
1	Estimate the average duration of fax callback delivery calls during the busy hour. When estimating this duration, include the following: <ul style="list-style-type: none"> • 10 seconds to set up the call • 14 seconds to answer the call • 12 seconds to establish the protocol • 40 seconds per page in normal resolution; 80 seconds per page in fine resolution • 10 seconds to complete the fax delivery (that is, end protocol/disconnect)
2	Estimate the number of fax callback deliveries during the busy hour.
3	Multiply the result of step 1 by the result of step 2 to determine the estimated total connect time used by fax callback deliveries in the busy hour.
4	Record the result in box 2 of “Worksheet for calculating the number of multimedia ports required” on page 1-21.

Fax announcement (stand-alone fax service)

A fax announcement service that requires the caller to enter a fax callback number requires a multimedia port only for the callback delivery. For this type of announcement, refer to the section “Determining the number of voice ports required” on page 1-7. To estimate the traffic generated by the actual fax delivery, use “Estimating the total busy hour connect time for fax callback deliveries” on page 1-23.

Estimating the connect time for fax announcements with “same call” fax delivery

A fax announcement service that delivers the fax during the same call (no callback number is required) must use a multimedia port for the entire call. The procedure for estimating the connect time for these types of announcements is similar to the procedure for voice menus with fax items. Follow these steps.

Step Action

- 1 Select a fax announcement and estimate the average duration of calls to this fax announcement during the busy hour.
 - time to listen to the announcement greeting
 - time to receive “same call” faxing instructions
 - time to transmit the fax
 - about 12 seconds to establish protocol
 - 40 seconds per page in normal resolution; 80 seconds per page in fine resolution
 - about 10 seconds to complete the fax delivery (that is, end protocol/disconnect)
 - 2 Estimate the number of calls to this fax announcement during the busy hour. This would depend on the specific function of this fax announcement in your organization.
 - 3 Multiply the result of step 1 by the result of step 2 to determine the estimated total activity generated from this fax announcement during the busy hour.
 - 4 Record the total on a piece of note paper.
 - 5 Repeat steps 1 through 4 for each fax announcement.
 - 6 Add all the fax announcement totals together and record the result in box 3 of “Worksheet for calculating the number of multimedia ports required” on page 1-21.
-

Calculating number of multimedia ports required

To calculate the number of non-dedicated multimedia ports required, use the following steps.

Step	Action
1	Add the totals from "Estimating the call connect time for multimedia voice menus" on page 1-22, "Estimating the total busy hour connect time for fax callback deliveries" on page 1-23, and "Estimating the connect time for fax announcements with "same call" fax delivery" on page 1-24. Record the result in box 4 of "Worksheet for calculating the number of multimedia ports required" on page 1-21.
2	Divide the result in box 4 by 100 to get the estimated busy hour multimedia activity in centi (hundred) call seconds (CCS). Record the result in box 5.
3	Determine the number of non-dedicated multimedia ports required based on the estimated busy hour system activity. See "Port capacity" on page 1-26. In the column labeled "Capacity of system," find the range within which the calculated total CCS falls. The corresponding value in the column labeled "Number of ports" is the number of non-dedicated ports required to accommodate the estimated total system activity.

Dedicated ports for fax callback deliveries

Note: If you plan to use dedicated ports for fax callback delivery, calculate the non-dedicated port requirements for other Fax on Demand services separately (see the preceding steps). Then add those port requirements to the number of dedicated fax callback ports to determine the total number of multimedia ports required.

Multimedia ports that are dedicated to callback delivery can support a much higher volume of traffic than non-dedicated multimedia ports. Specifically, 36 CCS can be supported by each dedicated port because the system can make continuous use of these ports.

By contrast, four non-dedicated multimedia ports can support 48 CCS altogether, or 12 CCS per port on average. Therefore, if you are going to use the callback method of delivering fax items, you may want to consider dedicating multimedia ports to callback delivery.

The maximum wait time would have to be less than 3600 seconds (1 hour), or else the system could become overloaded.

Calculating the number of dedicated multimedia ports required for fax callback deliveries

To calculate the number of dedicated multimedia ports required for fax callback deliveries, follow these steps.

Step Action

- 1 Use the following formula to determine how many dedicated ports you would require:

$$\text{Ports required} = (\text{Total fax callback delivery call seconds in (busy hour)} / (\text{Maximum wait time for (delivery in seconds)})$$
- 2 Record the result in box 7 of the "Worksheet for calculating the number of multimedia ports required" on page 1-21.

Port capacity

Number of ports	Capacity of system (in CCS)
2	0 to 8
3	9 to 21
4	22 to 39
5	40 to 59
6	60 to 81
7	82 to 105
8	106 to 130
10	131 to 183
12	184 to 238
14	239 to 295
16	296 to 353
18	354 to 413
20	414 to 474
22	475 to 536

Number of multimedia ports required

Number of ports	Capacity of system (in CCS)
24	537 to 598
26	599 to 661
28	662 to 725
30	726 to 789
32	790 to 854

Total number of voice and multimedia ports required

Multimedia ports and voice ports

Note: If multimedia ports are not required (for example, you have not purchased Fax on Demand), then system size can be based solely on the number of voice ports. No conversion to physical ports is required since one voice port equals one physical port location.

Multimedia applications require more processing than voice applications. As a result, two physical port locations are required to configure one multimedia port, whereas only one physical port location is required to configure one voice port. Therefore, a system with multimedia ports is larger than a system with the same number of voice ports.

For example, if you required a system with five multimedia ports and six voice ports as per your calculations to this point, you would actually need a system with 16 physical port locations (ten ports to configure five multimedia ports, and six ports to configure six voice ports). As a result, to determine the actual system size you need in terms of the number of physical port locations, you need to convert the multimedia port requirements to an equivalent number of voice ports. Then add this to the number of voice ports required to determine the overall system size required.

Number of ports required (voice and multimedia)

Use “Calculating the total number of voice and multimedia ports” on page 1-29 to calculate the total number of ports required to support voice and multimedia services. Use “Worksheet for calculating the total number of ports required for voice and multimedia services” on page 1-29 as your worksheet.

Total number of voice and multimedia ports required

Worksheet for calculating the total number of ports required for voice and multimedia services

Ports required for voice and multimedia services			
1	Number of ports required for voice services (including dedicated ports) from box 15 of "Worksheet for calculating busy hour activity and the number of voice ports required" on page 1-9	1	
2	Number of ports required for multimedia (including dedicated ports) from box 8 of "Worksheet for calculating the number of multimedia ports required" on page 1-21	2	
3	Equivalent number of physical ports required to support multimedia services (multiply line 2 by 2)	3	
4	Total number of physical ports required (add lines 1 and 3)	4	
5	If the result in box 4 cannot be divided evenly by 4, add more basic-service ports until the total can be divided evenly by 4	5	

Note: To determine the minimum number of nodes required, refer to "Determining the number of nodes" on page 1-41.

Calculating the total number of voice and multimedia ports

Step Action

- 1 Copy the figure from box 15 (total voice ports) of "Worksheet for calculating busy hour activity and the number of voice ports required" on page 1-9 into box 1 of "Worksheet for calculating the total number of ports required for voice and multimedia services" on this page.
- 2 Copy the figure from box 8 (total multimedia ports) of "Worksheet for calculating the number of multimedia ports required" on page 1-21 into box 2 of "Worksheet for calculating the total number of ports required for voice and multimedia services" on this page.
- 3 Multiply box 2 by two and record the result in box 3.

Step Action

- 4 Add boxes 1 and 3 together. Record the result in box 4.
 - 5 If required, add more basic ports until the total number of ports can be divided evenly by four. (Ports are provided on voice processor cards in multiples of four.) Record the new total in box 5.
 - 6 Look up the total in "Node configurations" on page 1-41 to decide the number of nodes your system will require.
-

Determining storage hours required

Introduction

The storage hours on a system, combined with the number of nodes, defines the system size. For example, a 2-node 54-hour system has a greater message storage capacity than a 2-node 26-hour system. Note that the storage hours referred to here do not include basic system storage hours (that is, for the basic software, and for voice prompts for one language).

The storage hours your system requires depend on the requirements for

- message storage, which includes stored messages, personal verifications, and responses to voice forms
- voice services, which includes voice menus, announcements, voice forms definitions, and fax definitions
- personal verifications

These sources of storage requirements are discussed in “Message storage requirements” on page 1-32, “Voice services storage requirements” on page 1-36, and “Personal verifications storage requirements” on page 1-40. These sections are followed by “Determining system size based on traffic (nodes and ports) and storage hour requirements” on page 1-42, which explains how to calculate the total storage hours required and the overall system size your site requires.

Message storage requirements

Introduction

Message storage includes received messages or unsent composed messages stored in your mailbox, greetings, and responses to voice forms.

Total message storage time required depends on

- number of users
- average storage per user (for messages and personal verifications)
- voice forms response times

The method for determining the required amount of message storage time, based on the preceding items, is divided into three procedures that are outlined in the remainder of this section.

Storage time required for messages and personal verifications

The average storage per user is based on the average number of stored messages per user (received and composed but not sent) and the average length of each message, plus the length of the greetings. This varies depending on the organization and applications. The minimum storage time that should be allowed per user is one minute. Average message length is about 30 seconds. If each user is allocated 10 minutes of storage time, then approximately 20 messages (including greetings) can be stored per user.

Note: The storage requirements for personal verifications are calculated separately. Refer to “Personal verifications storage time calculation example” on page 1-40.

When determining storage requirements for messages, consider the average storage time required per user, since this storage time reflects the storage time that will actually be used. The maximum allocated time is the limit on message storage, not the amount that you expect will be used, on average, by each user.

There are a number of factors to consider when estimating average message storage time, including

- user training to use the delete messages command

Message storage requirements

- maximum allocated time
- Read Message Retention period (automatic deletion of read messages)
- whether sent messages are kept or automatically deleted after sending
- messages received per user per day

Calculating the storage time required for messages and personal verifications

To calculate the storage time required for messages and personal verifications, follow these steps.

Step Action

- 1 Estimate the total number of users on the Meridian Mail system.
- 2 Estimate the average number of minutes of storage each user requires.
- 3 Multiply the result of step 1 by the result of step 2.
- 4 Multiply the result of step 3 by 1.2 (to add a 20 percent safety margin).
- 5 Divide by 60 to convert the storage time to hours.

Example:

If there are 1000 Meridian Mail users and average storage per user is 5 minutes, the total storage time is 5000 minutes. With a 20 percent safety margin added on, total storage time is 6000 minutes or 100 hours as shown in the following table.

Message storage time calculation example

Number of Meridian Mail users	Storage per user x (minutes)	Storage time with 20% safety margin x	Total storage = time
1000	5	1.2	6000/60 = 100 h

Storage time required for responses to voice forms

Voice forms allow subscribers to call the system and provide verbal information to prerecorded prompts.

A typical voice form contains ten prompts, and a response to each prompt is typically ten seconds long. Thus, a total of 100 seconds of response storage time is required for each call to a typical voice form. If you know what the voice forms are going to be and have an idea of what response time you can expect, you can estimate more precisely the storage time required.

Calculating the storage time required for voice forms responses

To calculate the storage time required for voice forms responses, follow these steps.

Step Action

- 1 Determine the number of prompts in each voice form.
 - 2 Multiply the number of prompts by the expected response time (in seconds) for each prompt.
 - 3 Estimate the number of calls to each voice form before the responses are transcribed and deleted.
 - 4 For each form, multiply the number of calls by the expected total response time in seconds.
 - 5 Divide the storage time by 3600 to convert to hours.
-

Voice forms response time calculation example

Voice form number	Number of calls to voice form prior to deletion	x	Estimated total response time (seconds)	=	Required storage time (seconds)
1	50		100		5000
2	20		100		2000
3	50		100		5000
Total storage time in hours =					12 000 seconds/3600 = 3.3 h

Calculate the total message storage requirements

To calculate the total message storage requirements, follow these steps.

Step Action

- 1 Add the storage times determined in "Calculating the storage time required for voice forms responses" on page 1-34.
- 2 If you have not already done so, convert the storage times to hours.

Total message storage requirements calculation example

Storage for users	100 hours
Storage for voice forms responses	3.3 hours
Total message storage time required	103.3 hours

Voice services storage requirements

Introduction

Voice services includes voice menus and announcements, voice forms, and fax on demand.

The voice services storage time depends on the following factors:

- voice menus and announcements storage requirements
- voice forms definitions requirements
- fax definitions requirements

The method for determining the required amount of voice services storage time, based on the factors listed above, is divided into four procedures. These procedures are outlined in the remainder of this section.

Voice menus and announcements storage requirements

Estimate the storage time required for voice menus and announcements (if you have purchased that option). This depends on the type of applications you wish to have. Information-type menus require more storage time than call-handling applications (automated attendants, for example). The following procedures help you to determine the voice menus and announcements storage requirements.

Estimating the storage time required for voice menus and announcements

To estimate the storage time required for voice menus and announcements, follow these steps.

Step	Action
1	Estimate the number of voice menus and announcements required.
2	Determine the wording of each voice menu and announcement.

Step Action

- 3 Once the wording of each menu and announcement is determined, estimate the time (in minutes) each will take for playback.
- 4 Add the playback times for all the voice menus and announcements.
- 5 Divide the storage time by 60 to convert to hours.

Voice menus and announcements storage time calculation example

Voice menus and announcements	Estimated playback time (minutes)
Auto-attendant prompt	1
Auto-attendant choices	2
Announcement 1	1
Announcement 2	1
Thru-dial announcement	1
Voice menu 1 greeting	1
Voice menu 1 choices	2
Voice menu 1 announcement 1	1
Voice menu 1 announcement 2	1
Voice menu 1 announcement 3	1
Voice menu 2 greeting	1
Voice menu 2 choices	2
Voice menu 2 announcement 1	2
Voice menu 2 announcement 2	1
Total voice menus and announcements storage time =	18 minutes or 0.3 hours

Voice forms definitions storage requirements

Voice forms definitions are similar to voice menus. Therefore, the procedure for calculating the voice form definitions storage requirements is similar to the procedure for calculating voice menu storage requirements. See “Estimating the storage time required for voice forms definitions” on page 1-38.

Estimating the storage time required for voice forms definitions

To estimate the storage time required for voice forms definitions, follow these steps.

Step	Action
1	Estimate the number of voice forms required.
2	Determine the wording to be used for each form.
3	Estimate the playing time (in minutes) of each form.
4	Add the playback times for all forms. Include the voice form's initial greeting as well as any greeting, prompt, or other instructions played for each field.
5	Divide the storage time by 60 to convert to hours.

Voice forms definitions storage time calculation example

Voice form	Estimated playback time (minutes)
Voice form 1	2
Voice form 2	2
Voice form 3	2
Total voice forms definitions storage =	6 minutes or 0.1 hours

Fax storage requirements

The number of storage hours required for faxes depends on the number of fax pages and the resolution (quality) as follows:

- *normal resolution* 0.3 minutes per page or 200 pages per hour
- *fine resolution* 0.6 minutes per page or 100 pages per hour

Using these figures, estimate your fax storage requirements as outlined in “Estimating the fax storage requirements” on page 1-39.

Estimating the fax storage requirements

To estimate the fax storage requirements, follow these steps.

Step Action

- 1 Estimate the total number of *normal resolution* fax pages you plan to have on the Meridian Mail system.
- 2 Multiply the result of step 1 by 0.3 to get the total number of minutes of storage required.
- 3 Estimate the total number of *fine resolution* fax pages you plan to have on the Meridian Mail system.
- 4 Multiply the result of step 3 by 0.6 to get the total number of minutes of storage required.
- 5 Add the totals from steps 2 and 4 to get the total fax storage requirements in minutes.
- 6 Divide the storage time by 60 to convert to hours of storage.

Fax storage time calculation example

Number of pages	Minutes per page	=	Total storage time
20 normal	x 0.3		6 minutes
20 fine	x 0.6		12 minutes
Total storage in hours =			18/60 = 0.3 hours

Estimating the total hours of storage required for voice services

Add the storage times determined in “Estimating the storage time required for voice menus and announcements” on page 1-36, “Estimating the storage time required for voice forms definitions” on page 1-38, and “Estimating the fax storage requirements” on this page. See “Total voice services storage requirements calculation example” on page 1-40, for a sample calculation.

**Total voice services
storage requirements
calculation example**

Storage for voice menus and announcements	0.3 hours
Storage for voice forms definitions	0.1 hours
Storage for fax items	0.3 hours
Total storage time required for voice services	0.7 hours

**Personal verifications
storage requirements**

Allow about 3.5 seconds per personal verification. Therefore, if you have 1000 subscribers, required storage time is $1000 \times 3.5 = 3500$ seconds or approximately 1.0 hour.

If your system does not have any user mailboxes (that is, your system is strictly a voice menu system), then no personal verifications are necessary and this storage requirement can be ignored.

**Personal verifications
storage time
calculation example**

Number of users	x	Estimated average personal verification length(seconds)	=	Required storage time
1000		3.5		3500 seconds/3600 = 0.9 hour

Determining the number of nodes

The following table shows the number of ports and the range of storage hours available with different numbers of nodes (with only one language installed).

Node configurations

Ports	Nodes	Total storage hours	Total storage hours with disk-to-disk backup
4-12	1	5	n/a
		11	n/a
		24	n/a
		36	n/a
		54	n/a
		100	n/a
		200	n/a
16-24	2	26	n/a
		54	46.2
		84	76.2
		114	106.2
		200	190.1
28-32	3	400	384.8
		30	n/a
		60	36.3
		90	66.3
		120	96.3
36-48	4	200	176.3
		400	342.4
		45	n/a
		90	65.3
		120	95.3
52-64	5	180	155.3
		300	275.3
		600	524.5
		60	n/a
		120	92.4
		180	152.4
		240	212.4
		400	372.4
		800	704.6

Determining system size based on traffic (nodes and ports) and storage hour requirements

At this point you should have determined

- the number of nodes required (based on the number of ports required)
- the number of hours required for voice services
- the number of storage hours required for messages (including greetings and voice forms responses)

These three criteria are discussed in earlier sections of this chapter.

Use “Message storage and voice services storage hours available per system size” on page 1-44 to select the system size your site requires based on the previously mentioned criteria. The table shows the full range of system sizes available, classified by the number of nodes and total storage hours. It also shows the maximum number of hours available for voice services for each system size.

Before continuing, you need to understand the following points:

- All systems have a disk volume VS1 (Volume Server 1). This volume is used primarily for the system software and for personal verifications. However, some of the storage space on VS1 that is available for personal verifications can also be used for voice services. This space is indicated in the table on page 1-44 under the VS1 heading under “Maximum hours available for voice services and messages.”
- Messages (message storage) are not stored on VS1. The disk volumes available for message storage depend on the system size, as follows:
 - 1-node system—VS2 disk volume
 - 2-node system—VS2, VS202 disk volumes
 - 3-node system—VS202, VS203 disk volumes
 - 4-node system—VS202, VS203, VS204 disk volumes

- 5-node system—VS202, VS203, VS204, VS205 disk volumes

These volumes are also referred to as the user volumes.

- If the hours available on VS1 are enough to satisfy the expected voice services and personal verifications storage requirements, then voice services can be stored on VS1. If you can do this, then the storage hours available on the user volumes (see previous list item) can be used for message storage only.
- If both voice services and personal verifications cannot fit entirely on VS1, then the voice services must be stored on VS2 or VS202. (Note that VS2 is not available for voice services or message storage for 3-, 4-, and 5-node systems.) These volumes are also used for message storage.

As a result, you will have to combine the voice services and message storage requirements to determine the total message storage hours required. This also means that every hour of voice services storage that is added decreases the storage hours available for messages by one hour. Voice services storage cannot be shared over separate disk volumes. They must be stored on a single volume.

- The shaded areas in the table on page 1-44 indicate disk volumes that are unavailable for that system size or cannot be used for voice services for that system size. For example, disk volume VS202 is not available on 1-node systems. Also, on 3-, 4-, and 5-node systems, VS2 cannot be used for voice services or message storage.

Determining system size based on traffic (nodes and ports) and storage hour requirements

Message storage and voice services storage hours available per system size

Total storage hours			Maximum hours available for voice services and messages (per disk volume)			
Number of nodes	(without disk-to-disk backup)	(with disk-to-disk backup)	VS1	VS2	VS202 (without disk-to-disk backup)	VS202 (with disk-to-disk backup)
1	5	n/a	2.0	5		
	11	n/a	2.0	11		
	24	n/a	3.5	24		
	36	n/a	3.5	36		
	54	n/a	3.5	54		
	100	n/a	5.5	100		
	200	n/a	10	200		
2	26	n/a	2.0	11	15	n/a
	54	46.2	3.5	24	30	22.2
	84	76.2	3.5	24	60	52.2
	114	106.2	3.5	54	60	52.2
	200	190.1	5.5	100	100.0	90.1
	400	384.8	10	200	200.0	184.8
3	30	n/a	18.4		15	n/a
	60	36.3	18.4		30	6.3
	90	66.3	18.4		60	36.3
	120	96.3	18.4		60	36.3
	200	176.3	18.4		100.0	76.3
	400	342.4	51.9		200.0	142.4
4	45	n/a	18.4		15	n/a
	90	65.3	18.4		30	5.3
	120	95.3	18.4		60	35.3
	180	155.3	18.4		60	35.3
	300	275.3	18.4		100.0	75.3
	600	524.5	68.6		200.0	124.5
5	60	n/a	19.6		15	n/a
	120	92.4	19.6		30	2.4
	180	152.4	19.6		60	32.4
	240	212.4	19.6		60	32.4
	400	372.4	19.6		100.0	72.4
	800	704.6	86.6		200.0	104.6

Note 1: If a second language is installed, subtract three hours from VS2 for 1- or 2-node systems only.

Note 2: If three languages are installed, subtract three hours from VS1 for 3-, 4-, or 5-node systems, or six hours from VS2 for 1- or 2-node systems.

Note 3: If four languages are installed, subtract six hours from VS1 for 3-, 4-, or 5-node systems, or nine hours from VS2 for 1- or 2-node systems.

Adjustments for prompts for additional languages

The storage space for Meridian Mail voice prompts for one language (for example, English) is part of the basic software package, so it is not counted in the storage hours figures in “Message storage and voice services storage hours available per system size” on page 1-44. However, if you are going to have additional languages installed, this will reduce the storage hours available on either VS1 or VS2, depending on where the language prompts are stored for your particular system size.

The amount of storage space used up by the additional language prompts and where they are stored depends on the system size and the number of additional languages as shown in “Additional language storage requirements for VS1 and VS2” on this page. For example, on 1- and 2-node systems, additional language prompts reduce the storage hours available on VS2. On 3-, 4-, and 5-node systems, the first and second languages are part of the basic software package and do not impact storage hours available for messages or voice services. The third and fourth languages impact storage hours available on VS1.

Additional language storage requirements for VS1 and VS2

	Number of languages			
Number of nodes	1	2	3	4
1	0 hours	3 hours on VS2	6 hours on VS2	9 hours on VS2
2	0 hours	3 hours on VS2	6 hours on VS2	9 hours on VS2
3, 4, or 5	0 hours	0 hours	3 hours on VS1	6 hours on VS1

When you refer to “Message storage and voice services storage hours available per system size” on page 1-44, you must adjust the storage hour figures on VS1 and VS2 accordingly. Keep in mind that if the VS2 storage hours are decreased, the message storage hours available are also decreased by the same amount.

Establish whether disk-to-disk backup is required

Multi-node systems allow the system configuration (not user messages) to be manually or automatically copied to another disk in the system to allow recovery from a disk failure. Note that disk-to-disk backup is not supported in single-node systems, or in the 3-node 30-hour, 4-node 45-hour, or 5-node 60-hour systems. See “Message storage and voice services storage hours available per system size” on page 1-44.

Selecting the required system size

The steps required for selecting the system size based on traffic and storage requirements are listed below in “Determining the system size.” You must refer to “Message storage and voice services storage hours available per system size” on page 1-44 when following these steps.

Determining the system size**Step Action**

-
- | | |
|---|--|
| 1 | Consider the number of nodes required based on the traffic calculations earlier in this chapter. |
| 2 | Refer to “Message storage and voice services storage hours available per system size” on page 1-44. Find the smallest system size with enough nodes to satisfy the traffic requirements and enough message storage hours to satisfy your message storage requirements. |
| 3 | Once you have selected your system size, review the following IF/THEN table to confirm your decision. |
-

Determining system size based on traffic (nodes and ports) and storage hour requirements

Validating your system selection decision *Note:* Use “Message storage and voice services storage hours available per system size” on page 1-44 to determine the system size. Then use this table to validate your decision.

IF	THEN
both voice services and personal verifications can fit on VS1 on the system you selected	the message storage hours can be used entirely for messages and voice form responses.
voice services cannot fit on VS1 for the system you selected	voice services must be stored on VS2 or VS202. In this case, voice services must share space with message storage, so add the two numbers together to determine the combined storage requirements.
the number of nodes you selected has enough message storage hours available for the combined voice services and message storage requirements	that system is acceptable. Otherwise, you will need to select a system with more nodes. see if a system with one more node can be configured with sufficient storage hours.
the storage hours on the system you selected is close to your estimated storage requirements	you may prefer to choose the next larger system to allow for growth.

Examples

Example 1 lists the requirements for a system followed by the steps you follow to determine the system size required. Example 2 is a variation of Example 1.

Example 1:

Traffic requirement: 28 voice port equivalents (2 nodes)

- voice services storage: 0.7 hours
- personal verifications storage: 2.0 hours
- message storage: 103.3 hours
- additional languages: none
- disk-to-disk backup: no

The smallest system that can support the anticipated traffic is a 2-node system.

The smallest system with a minimum of two nodes that can provide enough message storage hours is the 2-node 114-hour system.

The voice services plus personal verifications storage requirement is 2.7 hours. The 2-node 114-hour system has 3.5 hours available for voice services plus personal verifications on VS1, so voice services can be stored there.

You must also decide if the 114 hours available on the system are enough to allow for growth since this system provides only 11.7 hours above the estimated requirements.

Example 2:

If the voice services requirement were larger (for example 4.0 hours), then voice services plus personal verifications would not both be able to fit on VS1. Voice services would have to share space with messages (on VS2 or VS202 for a 2-node system). However, the 114 message storage hours available on the selected system size are enough to accommodate message storage and voice services ($103.3 + 4.0 = 107.3$).

Again, you may prefer to choose the next larger system to allow for growth (a 2-node 200-hour system).

Determining the number of SMDI links

Multiple SMDI links are required if you have multiple PBX, DMS, or non-Meridian PBX systems attached to your Meridian Mail system. For multi-customer systems, you may also decide to have one customer per link. The maximum recommended number of links is 12 for a 5-node system.

Guidelines for CPE Centrex

Modular Option GP systems can have a maximum of 12 SMDI links. For CPE Centrex installation on DMS-100, AT&T #5 ESS, and AT&T #1A ESS, follow the guidelines outlined earlier in this chapter to determine the system size required.

Guidelines for Meridian Mail Connections

The following information applies when planning to connect your Meridian Mail system to AT&T, ROLM, or NEC PBXs. The principles stated earlier in this chapter still apply. Specific requirements for these PBXs are all that are covered.

Service standard

On AT&T and ROLM systems, where digital set emulation is used, incoming calls are routed through the VoiceBridge. An incoming call is processed by the VoiceBridge first before it is transferred to a Meridian Mail voice port. The VoiceBridge also processes Message Waiting Indication (MWI) updates. The traffic that can be handled by Meridian Mail is therefore primarily determined by how many (and how fast) call transfer/MWI updates can be processed by the VoiceBridge.

Also, on AT&T PBX systems, the VoiceBridge takes approximately 2.5 seconds to process each transaction. On ROLM systems, a transaction takes approximately 3.5 seconds. Due to this processing time required for VoiceBridge transactions for the AT&T and ROLM switches, the grade of service obtained with these switches does not normally match that obtained in a non-Connections Meridian Mail system.

AT&T PBXs

Digital set emulation is used in Connections to AT&T PBXs. The tables on pages 1-52 and 1-53 summarize the call traffic that may be supported by VoiceBridge units. The table on page 1-53 summarizes the multimedia (fax call) traffic that can be supported by VoiceBridge units. The service conditions are as follows:

- There is a 5 percent probability of a delay greater than 12 seconds before a call is presented to Meridian Mail.
- Average session time (that is, the duration from the time a call is answered by Meridian Mail to when it is disconnected by the user) is 40 seconds in the table on page 1-52, 60 seconds in the table on page 1-53, and 234 seconds in the table on page 1-53.

The data in the tables assume only call transactions and MWI updates are done. Note that the call traffic is expressed in calls/hour as well as CCS, since the limiting factor is the number of calls that can be processed by the VoiceBridge. The service time for an MWI update is about the same as that for a call transfer.

**AT&T traffic capacity for P05
(delay > 12 seconds) using 40-second sessions**

Voice-Bridges	Voice ports	Calls/hour (40 seconds each)	Busy hour traffic (CCS)
1	4	136	54.3
1	8	394	157.6
2	12	684	273.8
2	16	991	396.2
2	20	1306	522.5
3	24	1629	651.6
3	28	1956	782.6
4	32	2288	915.0
4	36	2622	1048.7
5	40	2959	1183.4
5	44	3297	1318.9
6	48	3638	1455.1
6	52	3980	1591.8
7	56	4323	1729.1
7	60	4667	1866.8
7	64	5012	2004.9

**AT&T traffic capacity for P05
(delay > 12 seconds) using 60-second sessions**

Voice-Bridges	Voice ports	Calls/hour (60 seconds each)	Busy hour traffic (CCS)
1	4	85	51.5
1	8	250	150.5
1	12	437	262.2
2	16	634	380.4
2	20	837	502.6
2	24	1046	627.7
2	28	1258	754.9
3	32	1473	883.8
3	36	1690	1014.0
3	40	1909	1145.4
3	44	2129	1277.6
4	48	2350	1410.7
4	52	2574	1544.5
4	56	2798	1678.9
5	60	3023	1813.8
5	64	3248	1949.2

**AT&T fax calls traffic capacity for P05
(delay > 12 seconds) using 234-second sessions**

Voice-Bridges	Multimedia ports	Calls/hour (234 seconds each)	Busy hour traffic (CCS)
1	4	20	48.5
1	8	60	142.2
1	12	106	248.3
1	16	154	360.8
1	20	203	477.3
1	24	234	596.8

ROLM PBXs

Digital set emulation is used in Connections to PBXs. Since the transaction time on the ROLM PBX takes longer, a lower throughput is supported. The tables on pages 1-54 and 1-55 summarize the call traffic that can be supported by VoiceBridge units. The second table on page 1-55 summarizes the

multimedia (fax call) traffic that can be supported by VoiceBridge units. To support higher traffic, multiple VoiceBridge units are made into a hunt group. The service conditions are as follows:

- There is a 5 percent probability of a delay greater than 12 seconds before a call is presented to Meridian Mail.
- Average session time (that is, the duration from the time a call is answered by Meridian Mail to when it is disconnected by the user) is 40 seconds in the table on page 1-54, 60 seconds in the table on page 1-55, and 234 seconds in the second table on page 1-55.

The data in the tables assume only call transactions and MWI updates are done. Note that the call traffic is expressed in calls/hour as well as CCS, since the limiting factor is the number of calls that can be processed by the VoiceBridge. The service time for an MWI update is about the same as that for a call transfer.

**ROLM traffic capacity for P05
(delay > 12 seconds) using 40-second sessions**

Voice-Bridges	Voice ports	Calls/hour (40 seconds each)	Busy hour traffic (CCS)
1	4	136	54.3
2	8	394	157.6
2	12	684	273.8
3	16	991	396.2
3	20	1306	522.5
4	24	1629	651.6
4	28	1956	782.6
5	32	2288	915.0
6	36	2622	1048.7
6	40	2959	1183.4
7	44	3297	1318.9
8	48	3638	1455.1
8	52	3980	1591.8
9	56	4323	1729.1
10	60	4667	1866.8
10	64	5012	2004.9

**ROLM traffic capacity for P05
(delay > 12 seconds) using 60-second sessions**

Voice-Bridges	Voice ports	Calls/hour (60 seconds each)	Busy hour traffic (CCS)
1	4	85	51.5
2	8	250	150.5
2	12	437	262.2
2	16	634	380.4
2	20	837	502.6
3	24	1046	627.7
3	28	1258	754.9
3	32	1473	883.8
4	36	1690	1014.0
4	40	1909	1145.4
5	44	2129	1277.6
5	48	2350	1410.7
6	52	2574	1544.5
6	56	2798	1678.9
6	60	3023	1813.8
7	64	3248	1949.2

**ROLM fax calls traffic capacity for P05
(delay > 12 seconds) using 234-second sessions**

Voice-Bridges	Multimedia ports	Calls/hour (234 seconds each)	Busy hour traffic (CCS)
1	4	20	48.5
1	8	60	142.2
1	12	106	248.3

System performance

Once a user is connected to a Meridian Mail voice port, response time is the same as on a generic Modular Option GP system.

Meridian Integrated Communication Link

Introduction

Multiple Integrated Communication Links (ICLs) are supported on a single node where more than one serial port is available. This means that, for example, AdminPlus and Meridian IVR can run on the same node.

The number of links that can be created on a single node depends on the type of node and its position in the system as shown in the following table.

Maximum number of links supported

Number of nodes	Number of links
1	4
2	6
3	8
4	8
5	8

Note: Only one link can be used to run AdminPlus. Any one ICL link can be configured for use by AdminPlus.

The table “Data ports that can be used for ICLs (recommended setup for nodes 1 and 2)” on page 1-59 shows which data ports can be used for ICLs and the maximum bit rate (in kbps) that can be used on those ports. The table “Bit rate limitations for data links” on this page, lists both the minimum and maximum bit rates.

Bit rate limitations for data links

For	Minimum bit rate (per port)	Maximum bit rate (per port)	Maximum combined bit rate (per node)
RSM/Utility card	2400 bps	9600 bps	19 200 bps
CPU card	2400 bps	38 400 bps	38 400 bps
ICL	4800 bps	38 400 bps	not applicable

The combined bit rate for all configured ICLs cannot exceed 38 400 bps.

Data port configuration

Introduction

The table on page 1-58 provides information on configuring data ports for Modular Option GP systems.

Data port configuration

Node	Circuit pack	Port	Name	C o n s o l e	N e t w o r k	S M D I	M A T	P r i n t e r	A C C E S S/ A d m i n +	M a i n t e n a n c e	
1	MMP40	1	DP1	X							
		2	DP2								
	RSM	1	DP3		X	X	X	X	X		
		2	DP4		X	X	X	X	X		
2	MMP40	1	DP7			X	X	X	X		
		2	DP8						X	X	
		RSM	1	DP9		X	X	X	X		
			2	DP10		X	X	X	X		
3	MMP40	1	DP13			X	X	X	X		
		2	DP14						X	X	
		RSM	1	DP15		X	X	X	X		
			3	DP17		X	X	X	X		
4	MMP40	1	DP19			X	X	X	X		
		2	DP20						X	X	
		RSM	1	DP21		X	X	X	X		
			2	DP22		X	X	X	X		
5	MMP40	1	DP19			X	X	X	X		
		2	DP20						X	X	
		RSM	1	DP21		X	X	X	X		
			2	DP22		X	X	X	X		
6	MMP40	1	DP25		X	X	X	X			
		2	DP26						X	X	
		RSM	1	DP27		X	X	X	X		
			2	DP28		X	X	X	X		
6	MMP40	3	DP29		X	X	X	X			
		4	DP30		X	X	X	X			

Data ports that can be used for ICLs (recommended setup for nodes 1 and 2)

Note: Baud rates are shown in kbps. For nodes 3, 4, and 5, see the next table.

System limits				Node 1				Node 2							
# of nodes	Data links	Max. voice ports	Cum. baud rate	M	M					M	M				
				P	P	R	R	R	R	P	P	R	R	R	R
				4	4	S	S	S	S	4	4	S	S	S	S
				#	#	M	M	M	M	#	#	M	M	M	M
				1	2	1	2	3	4	1	2	1	2	3	4
1	0	12													
	1	12	9.6			9.6									
	2	12	19.2			9.6	9.6								
	3	12	19.2			9.6	4.8	4.8							
	4	12	19.2			4.8	4.8	4.8	4.8						
2	0	24													
	1	24	38.4							38.4					
	2	24	38.4							19.2	19.2				
	3	24	48.0			9.6				19.2	19.2				
	4	24	57.6			9.6	9.6			19.2	19.2				
	5	24	57.6			9.6	4.8	4.8		19.2	19.2				
	6	24	57.6			4.8	4.8	4.8	4.8	19.2	19.2				
3	0	32													
	1	32	38.4							38.4					
	2	32	76.8							38.4					
	3	32	76.8							19.2	19.2				
	4	32	76.8							19.2	19.2				
	5	32	86.4			9.6				19.2	19.2				
	6	32	96.0			9.6	9.6			19.2	19.2				
	7	32	96.0			9.6	4.8	4.8		19.2	19.2				
	8	32	96.0			4.8	4.8	4.8	4.8	19.2	19.2				
4	0	48													
	1	48	38.4							38.4					
	2	48	76.8							38.4					
	3	48	115.2							38.4					
	4	48	115.2							19.2	19.2				
	5	48	115.2							19.2	19.2				
	6	48	115.2							19.2	19.2				
	7	48	124.8			9.6				19.2	19.2				
	8	48	134.4			9.6	9.6			19.2	19.2				

System limits				Node 1				Node 2							
# of nodes	Data links	Max. voice ports	Cum. baud rate	MMP40#1	MMP40#2	RS1M	RS2M	RS3M	RS4M	MMP40#1	MMP40#2	RS1M	RS2M	RS3M	RS4M
5	0	64													
	1	64	38.4							38.4					
	2	64	76.8							38.4					
	3	64	115.2							38.4					
	4	64	153.6							38.4					
	5	64	153.6							19.2	19.2				
	6	64	153.6							19.2	19.2				
	7	64	153.6							19.2	19.2				
	8	64	153.6							19.2	19.2				

Data ports that can be used for ICLs (recommended setup for nodes 3, 4, and 5)

System limits				Node 3		Node 4		Node 5	
# of nodes	Data links	Max. voice ports	Cum baud rate	MMP40#1	MMP40#2	MMP40#1	MMP40#2	MMP40#1	MMP40#2
1	0	12							
	1	12	19.2						
	2	12	19.2						
	3	12	19.2						
	4	12	19.2						
2	0	24							
	1	24	38.4						
	2	24	38.4						
	3	24	48.0						
	4	24	57.6						
	5	24	57.6						
	6	24	57.6						
3	0	32							
	1	32	38.4						
	2	32	76.8	38.4					
	3	32	76.8	38.4					
	4	32	76.8	19.2	19.2				
	5	32	86.4	19.2	19.2				
	6	32	96.0	19.2	19.2				
	7	32	96.0	19.2	19.2				
	8	32	96.0	19.2	19.2				
4	0	48							
	1	48	38.4						
	2	48	76.8	38.4					
	3	48	115.2	38.4					
	4	48	115.2	38.4					
	5	48	115.2	19.2	19.2				
	6	48	115.2	19.2	19.2				
	7	48	124.8	19.2	19.2				
	8	48	134.4	19.2	19.2				

System limits				Node 3		Node 4		Node 5	
# of nodes	Data links	Max. voice ports	Cum baud rate	M M P 4 0 # 1	M M P 4 0 # 2	M M P 4 0 # 1	M M P 4 0 # 2	M M P 4 0 # 1	M M P 4 0 # 2
5	0	64							
	1	64	38.4						
	2	64	76.8	38.4					
	3	64	115.2	38.4					
	4	64	153.6	38.4					
	5	64	153.6	38.4					
	6	64	153.6	19.2	19.2				
	7	64	153.6	19.2	19.2				
	8	64	153.6	19.2	19.2				

Chapter 2

Selecting a site

In this chapter

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Power requirements	2-6
Heat dissipation	2-9
Cable requirements	2-10
Creating the cable plan	2-12
Environmental specifications	2-13
Security	2-17

Overview

Introduction

The location of the Meridian Mail equipment can have an overall effect on system performance and costs. The location of the various system components relative to one another and to power sources can affect the operation of the system. For efficient operation of Meridian Mail, consider the following:

- space required
- location
- floor plan
- power and cable requirements
- environmental specifications

Space requirements

Introduction

The space requirements for the Meridian Mail unit are itemized, followed by other Meridian Mail space requirement information (storage space, maintenance, and operator area requirements).

The system is composed of stackable Universal Equipment Modules (UEMs), each containing one Meridian Mail node. Meridian Mail Modular Option GP has the following dimensions:

Width	80 cm (32 in.)
Depth (cube/top cap)	53 cm (21 in.)
Depth (pedestal)	64 cm (25.5 in.)
Height (1-node)	78 cm (31 in.)
Height (each additional node)	43 cm (17 in.)

A fully loaded 1-node UEM weighs approximately 95 kg (209 lb). Each additional UEM weighs 68 kg (150 lb).

For easy maintenance, the floor space for the Meridian Mail Modular Option EC must include at least 90 cm (36 in.) of unobstructed space at the front, 90 cm (36 in.) at the rear, and 30 cm (12 in.) on each side of the equipment column.

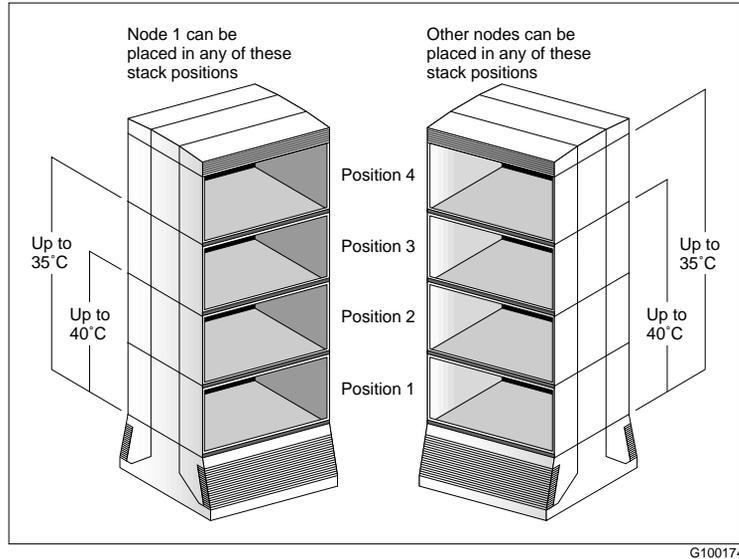
Module placement

Meridian Mail modules should be placed (as shown in the illustration on page 2-4) according to the following guidelines:

The module that contains node 1 (the primary node, which contains the tape drive) can be placed in the first or second position of a stack when operating in ambient temperatures of up to 40°C (104°F). It can also be placed in the third position of a stack when the ambient temperature will not exceed 35°C (95°F).

Other modules can be placed in the first, second, or third position of a stack when operating in ambient temperatures of up to 40°C (104°F). They can also be placed in the fourth position of a stack when the ambient temperature will not exceed 35°C (95°F).

Meridian Mail module placement



Storage space

Space should be provided for the storage of tapes, printer paper, printouts, and daily reports.

Space for maintenance and operator

The maintenance and operator area is primarily for the administrator's terminal and printer. The operator area must be coordinated with the PBX equipment area if Meridian Mail and PBX equipment are in the same room. For Meridian Mail use, this area must have

- a shelf for instruction books
- an administration terminal (HP700/32, for example) or IBM PC (or compatible)
- a printer, paper supply, and stand
- a table or desk big enough for the administration terminal and printer
- a modem (optional)
- an A/B switchbox (optional)
- a PBX integration unit (optional)

The distance between the administration terminal, printer, and Meridian Mail cannot exceed the 15.38 m (50 ft) limit imposed

by the RS-232 interface standard unless you use Limited Distance Modems.

Draw up a floor plan of the equipment room showing the relative locations of the system components:

- PBX and Modular Option GP cabinets
- administration/maintenance terminal and printer
- AC panel and outlets
- cable racks
- modem
- A/B switchbox
- switch
- Meridian Mail
- PBX integration unit (optional)

Power requirements

Introduction

Power supply requirements are described on the following pages for Meridian Mail, administration terminal, printer, and remote access and networking modems.

Meridian Mail

The Meridian Mail Modular Option GP uses an NT8D40 power distribution unit. Each module is powered by a DC common equipment power supply unit (DCEPS) providing 384 W from a 48 V DC input.

The power requirements for the Meridian Mail Modular Option GP are shown in the following table.

Power supply requirements

Power	1-node	2-node	3-node	4-node	5-node
240 V AC	2.0 A	4.0 A	6.0 A	8.0 A	10.0 A
-48 V DC	6.0 A	12.0 A	18.0 A	24.0 A	30.0 A

Meridian Mail Reporter terminal

In previous releases of Meridian Mail, a PC using AdminPlus could be used to administer Meridian Mail. That feature has been discontinued.

AdminPlus on the PC has been replaced with Meridian Mail Reporter, a package that enables you to download billing records from Meridian Mail and produce management reports.

Note: You cannot use Meridian Mail Reporter to perform Meridian Mail administration tasks.

If you are using a PC with Meridian Mail Reporter, check with the manufacturer for the PC power requirements. You can also refer to

- “Meridian Mail Reporter terminal power supply requirements” on page 2-7
- *Meridian Mail Reporter User Guide*

Meridian Mail Reporter terminal power supply requirements

Terminal type	Power input	Power usage
NT220/Ampex 220	115 V AC at 0.5 A 235 V AC at 0.25 A	55 W (193 BTU/hour) 50–60 Hz
VT220	120 V AC at 0.48 A 240 V AC at 0.24 A	60 W maximum 47–63 Hz
HP700/22	120 V AC at 0.3 A 240 V AC at 0.15 A	35 W (110 BTU/hour) 50–60 Hz
VT320	120 V AC nominal at 0.4 A	50 W maximum 57–63 Hz
HP700/32	120 V AC at 0.3 A 240 V AC at 0.15 A	35 W (110 BTU/hour) 50–60 Hz
VT420	120 V AC at 0.56 A 240 V AC at 0.28 A	67 W maximum 50–60 Hz
VT520	120 V AC at 0.56 A 240 V AC at 0.28 A	67 W maximum 50–60 Hz

Printers

The power supply requirements for the printers are shown in the following table.

Printer type	Power input	Power usage
LA75	100 or 120 V AC at 1.6 A, 50/60 Hz	50 W
LA30N	100 to 120 V AC; -10%, +6%; 50/60 Hz	120 W to 240 W (maximum)

Modems

The method of remote access is by way of a 2400- or 9600-baud modem connected to an A/B switchbox. The optional Networking service requires a 2400-baud modem connected to an RS-232 port at the RSM card fanout cable.

Note: If you have a 2400-baud modem, you can reprogram it to run with a port speed (RS-232) of 9600 bps. The power supply requirements for modems are shown in the following table.

Modem type	Power input	Power usage
Ven-tel 2400	120 V AC, 60 Hz	8 W nominal
Ven-tel 9600plus II	120 V AC, 60 Hz	8 W nominal
UDS EC 224A/D	115 V AC +/- 10, 50/60 Hz	8 W nominal
UDS 2440	115 V AC +/- 10, 50/60 Hz	8 W nominal
Racal ALM 3223	120 V AC, 50/60 Hz	8 W nominal
Hayes Optima 144	120 V AC, 50/60 Hz	8 W nominal
U.S. Robotics Sportster 14.4	120 V AC, 50/60 Hz	8 W nominal

PBX integration unit

The VoiceBridge PBX integration unit is used to connect Meridian Mail to selected models of AT&T, ROLM, and NEC PBXs as a centrex switch. It allows Meridian Mail to communicate with these PBXs via the SMDI protocol. A VoiceBridge is provided if you have ordered the Meridian Mail Connections option.

VoiceBridge power supply requirements

Power input	120v AC, 60 Hz
Power usage	40 W nominal

Heat dissipation

Introduction

The air conditioning in the equipment room must be capable of maintaining the operating temperature for the equipment (see “Equipment temperature and humidity specifications” on page 2-15) while handling heat produced by the following sources:

- Universal Equipment Modules containing Meridian Mail
- Meridian Mail
- switch
- peripheral devices
- equipment room personnel
- lighting
- external walls, windows, floors, and ceilings enclosing the room (if they permit heat to enter the equipment room)

Cable requirements

Introduction

The customer is responsible for supplying risers, feeders, and access to station cabling, including the following where necessary:

- conduit
- floor boring
- wall boring
- hung ceiling access, including removal and replacement of ceiling tiles

Cable types

Meridian Mail uses the following types of cabling:

- 25-pair twisted cable
- power cable
- RS-232 cable
- network loop cable
- 2-pair twisted cable (only if Local Data Sets are used)

25-pair twisted cables

These cables carry voice information between Meridian Mail and the PBX. One end of the cables must have an Amphenol 25B male cable-to-panel connector that terminates on the cabinet I/O panel. The other end terminates on the MDF (main distribution frame) with bare wire. Each node requires a separate 25-pair cable.

Power cable

The power cables are 8 AWG stranded cables.

RS-232 cables

The RS-232 cables connect Meridian Mail to the PBX, auxiliary equipment, and peripheral equipment. The maximum unaided RS-232 cabling distance is 15.38 m (50 ft). This distance can be extended up to 1231 m (4000 ft) by use of limited distance modems.

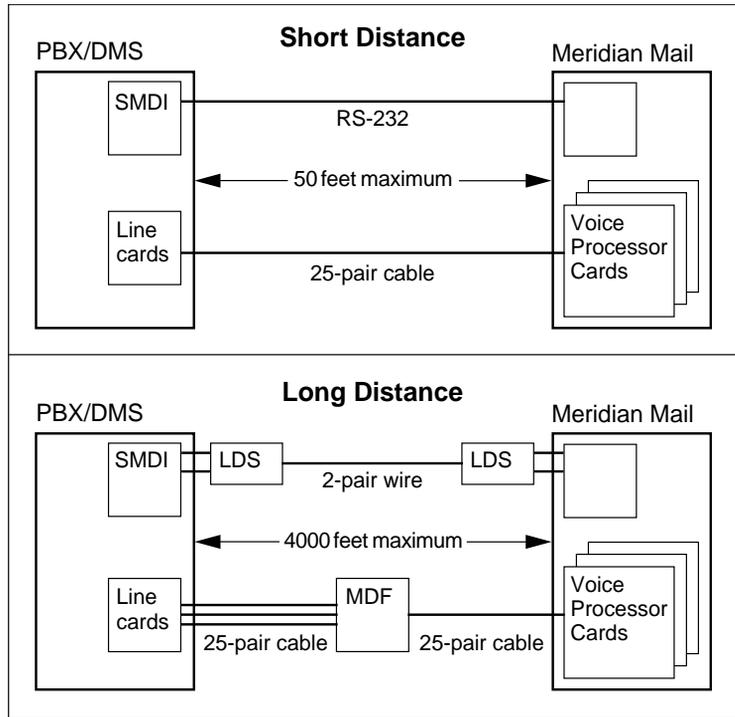
Network loop cable

For each group of 24 channels, the network loop cable has a maximum length of 15.38 m (50 ft).

2-pair twisted cable

The 2-pair twisted cable connects the Local Data Sets in installations where Meridian Mail is between 15.38 and 1231 m (50 and 4000 ft.) from the switch.

Short and long distance cable layouts



G101100

Creating the cable plan

Introduction

Include the following information in the cabling plan:

- cable plan for the building
- ownership of any existing wire, clearly defined
- location of all distribution points (main and intermediate)
- telephone directory number and features
- location of conduits, floor ducts, and other relevant information

The cabling plan must show the routing of all wiring including the start and end point of each cable relative to the location of devices in the office. It must indicate the location of each device, its features, and any other relevant information. It should also show the location of all power outlets.

Each power outlet must be equipped with a safety ground.

Sometimes wires are run inside conduits. The conduits may run between utility closets and jack locations, and may connect to other conduits passing through walls or ceilings. *When telephone cable is run in a conduit, that conduit must not be used for any wiring other than telephone cabling.*

Telephone utility closets are usually located one above the other with a hole or short conduit passing through the ceiling of one utility closet to the floor of the one above. Only licensed personnel should install conduit.

Maintain a cable record such as the one given in Appendix B.

Decide upon the termination points for wires once you have determined the wire routes. The voice cables terminate at the main distribution frame (MDF), typically in the equipment room.

House cables terminate on the vertical side of two-sided frames and cross-connect to equipment usually located on the horizontal side. When a color field approach is taken, the house cables terminate in the blue field, and the equipment terminates on the purple (USA) or white (Canada) field. In all cases, clearly designate the block where the cables are terminated, showing the cable location information and the cable pair assignments.

Environmental specifications

Introduction

When the Meridian Mail system is in the same room as the PBX or the DMS, and the environment is suitable for the PBX, then the primary environmental specifications for Meridian Mail are satisfied. Whether or not they are located in the same room, also consider the points discussed in the following “General requirements” section when deciding upon the exact location for Meridian Mail in the equipment room.

General requirements

Locate equipment in an area that is

- not subject to static electricity
IEEE Standard 142-1982 recommends that flooring resistance should be more than 25 000 megohms and less than 1 million megohms, measured by two electrodes 0.92 m (3 ft) apart on the floor. Each electrode must weigh 2.2 kg (5 lb), and have a dry flat contact area of 6.4 cm (2.5 in.) in diameter.
- not subject to vibration
The cabinet should be subject to minimum vibrations (less than 0.5 g at 400 Hz), since vibration can cause slow deterioration of mechanical parts. If severe, it can cause errors on disks. Structure-borne vibration and consequent noise transferred to the equipment room should be avoided. Raised floors should have extra support jacks to prevent the transmission of vibration.
- away from a sprinkler system, water, steam, or other liquid-carrying pipes
If sprinklers are required for insurance or local ordinance reasons, the minimum allowable number of heads should be installed, and they should be set to operate at the highest allowable temperature. A dry pipe system is preferred. Sprinkler heads should be equipped with wire cages. Equipment cabinets must not be located directly below sprinkler heads.
- physically safe for personnel and equipment
- away from windows where sunlight may fall directly on any part of any cabinet

- not subject to corrosive fumes or exhaust from machinery or where steam vents are present
- away from any passageways for moving machinery or vehicles
- away from sources of radiated interference (maximum 5 V/m at a distance of 3 m [10 ft])
- not subject to electromagnetic interference (EMI)

Sources of EMI located close to the equipment may have an effect on system operation. Some common EMI sources known to disturb system operation are

- broadcast stations
- radar
- mobile communications
- high-voltage power lines
- power tools
- office business machines such as copiers
- fluorescent lights
- dimmer switches

Ambient temperature and humidity

High temperatures tend to increase the rate of deterioration of most materials. Temperature cycling can cause temporary or permanent changes to equipment and can affect the grade of service. Refer to *IEC 68-2-14* (Test Nb) for temperature cycling guidelines. Low humidity can increase the buildup of static electricity, while high humidity can adversely affect the performance of disks, tapes, and printers.

Maintain the system within an ambient temperature range of 10° to 40°C (5 to 104°F) and 10 to 80 percent RH non-condensing humidity (see “Equipment temperature and humidity specifications” on page 2-15). The rate of change should not exceed 1.8°C (1°F) per minute. For non-operative equipment, the applicable specifications are a temperature range of -20° to +60°C (-4 to +140°F) and an RH non-condensing humidity range of 10 to 80 percent.

Equipment temperature and humidity specifications

Equipment	Temperature	Humidity
Module	5–40°C (41-104°F)	5–80% RH non-condensing
Disk unit	10–50°C (50-122°F)	8–80% RH non-condensing
VT220 (or compatible) terminal	10–40°C (50-104°F)	10–90% RH non-condensing
Printer	10–40°C (50-104°F)	10–90% RH non-condensing
A/B switchbox	0–40°C (32-104°F)	5–95% RH non-condensing
Modem	0–40°C (32-104°F)	5–95% RH non-condensing
Overall system	10–40°C (50-104°F)	10–80% RH non-condensing
VoiceBridge	0–55°C (32-131°F)	5–95% RH non-condensing

Dust density

The recommended maximum dust density in the equipment room is no more than 1 000 000 particles (0.5 microns and up) per cubic foot. Dust density must be Zone 4 (0.00014 g/cubic meter) or better. Average residential dust density is Zone 3 (0.00030 g/cubic meter). False ceilings and tiled floors contribute to maintaining dust density requirements.

Altitude

The system can operate at an altitude of 3076 m (10 000 ft) without special conditioning. Contact Nortel Networks if the system is to be operated at an altitude above 3076 m (10 000 ft).

Air conditioning

The amount of air conditioning required can be estimated at a rate of 1 Mg (1 ton) for every 3516.85 W (12 000 BTU) per hour of heat generated by the equipment and equipment room personnel plus 1 Mg (1 ton) for each 46.45 m² (500 sq ft) of floor space. Each person in the equipment room generates 175.84 W (600 BTU) per hour. Use these figures when calculating air conditioning requirements.

Energy saving measures, such as shutdown of air conditioning on weekends, may be dangerous to your system. They can result in temperatures that might harm system operation.

A qualified air conditioning engineer should determine specific requirements.

Fire protection

Building fire and safety codes provide adequate protection for Meridian Mail. Additional information is available from the National Fire Protection Association in its publications entitled *Standards for the Protection of Electronic Computer/Data Processing Equipment* (NFPA 75), and *National Electrical Code* (NFPA 70).

Safety procedures

Train personnel in such emergency measures as the proper method of shutting off all electrical power, notifying the fire department clearly and promptly, handling fire extinguishers, and evacuating personnel and records.

Check services such as steam, water, and power regularly, and inspect pipes for excess condensation, leaks, and corrosion. If power connections are made beneath a raised floor, use waterproof electrical receptacles and connectors.

Security

Ensuring data security Take special precautions to protect critical data such as business records or other information that is expensive or impossible to duplicate. Duplicate copies of data should be stored away from the equipment area. In most cases, a regular updating program is necessary to maintain the value of such duplicate data storage.

It is particularly important to ensure that both keycodes and backup tapes are stored in a safe place.

Ensuring equipment security If necessary, extend and improve existing practices of building security and fire protection to provide adequate protection for the equipment.

Equipment room accessories Use a CO₂ fire extinguisher on electrical fires. Do not use water on electrical fires.

Install temperature and humidity monitoring devices containing both visual and audible alarm signals in the equipment and storage room so that personnel can act if the environmental conditions approach critical limits.

Chapter 3

Preparing for installation

In this chapter

Equipment considerations	3-2
Information to have on hand	3-4
Pre-installation inspections	3-5
Preparing for Meridian Mail delivery	3-6
Equipment handling precautions	3-7

Equipment considerations

For DMS or SL-100 systems

To connect Meridian Mail to DMS, DMS-10, or SL-100 equipment, the switch requires

- BCS (Batch Change Supplement) 27 or later release

Note: Patch DDK 14AA is required for BCS29 or earlier

- (NT1X89AA/AB) for 2400 baud for the SMDI link
- one analog loop (NT6X18AA/AB) configured for ground start signalling per voice port (an NT6X23AA card is also required for line diagnostics)
- the following software packages:
 - NTXE47AA01 (broadcast messaging feature)
 - NTX100AA (basic package)
 - NTX901AA (local features)
 - NTX101AA (enhanced package)
 - NTX119AA (Message Service package)
 - NTX730AA (Multilink ASCII device driver)
 - NTX119AA (SMDI package)
- 25-pair cable for voice ports

For AT&T PBX systems

To connect Meridian Mail to AT&T PBXs, the PBX requires

- software release R1V1 or greater on System 75, R2V1 or greater on System 85, and G1, G2, or G3 on Definity
- one or more AT&T integration units (A0380908)
- one digital line port for each integration unit
- one analog loop-start line per voice port
- 25-pair cable for voice ports

For ROLM PBX systems

To connect Meridian Mail to ROLM systems, the PBX requires

- software release 8003 or greater for 8000 CBX series, release 9003 or greater for 9000 CBX series, and 9751 BCS models 10, 40, 50, and 70
- one or more ROLM integration units (A0383524)

Equipment considerations

- one ROLM-phone interface port for each integration unit
- one analog loop-start line per voice port
- 25-pair cable for voice ports

For CPE Centrex installations

For CPE Centrex installations, the following is required:

- DMS-100, AT&T #5 ESS, or AT&T #1A central office switch
- 1200 or 2400 baud SMDI link (BelCore TR-NWT-000283)
- Limited Distance modems between Meridian Mail Modular Option GP cabinet and the DMS-100, AT&T #5 ESS, or AT&T #1A ESS

Information to have on hand

Introduction

The following items should be available at the time of installation:

- equipment room floor plan
- building cable plan
- installation plans
- Meridian Mail NTPs
 - *System Administration Guide*
(NTP 555-7001-30x)
 - *Installation and Maintenance Guide*
(NTP 555-7051-250)
 - *System Installation and Modification Guide*
(NTP 555-7001-215)
 - *Maintenance Messages (SEERs)*
(NTP 555-7001-510)

The following manuals are useful to have when installing Meridian Mail Connections:

- VoiceBridge Installation Procedures for AT&T Switches (NTP 555-7001-216)
- VoiceBridge Installation Procedures for ROLM Switches (NTP 555-7001-217)

The work order should include

- Line Equipment Number (LEN) assignments
- Line Number (LN) for message desk assignments
- Directory Number (DN) assignments of UCD agent and voice service
- system and terminal cross-connect assignments
- a detailed listing of the equipment and services ordered

Pre-installation inspections

Introduction

The following table identifies the items that should be inspected and signed off before starting the installation.

Pre-installation inspection checklist

For	Ensure that the following are completed	Check	Signature
Equipment room	<ul style="list-style-type: none"> • The equipment room complies with physical and environmental requirements. • Utility outlets are installed. • Lighting is installed. • The equipment room is cleaned and prepared. • The cabinet location is marked on the equipment room floor. 		
Peripheral device locations	<ul style="list-style-type: none"> • The terminal, printer, modem, A/B switchbox, and PC locations are ready. • AC outlets are provided. • Sufficient and appropriate terminal connecting blocks are provided. 		
General inspections	<ul style="list-style-type: none"> • Building cross-connect terminals are provided. • Conduits or floor-ducts to terminal locations (including service fittings) are installed. • ICL conduit for raceway is placed. • Sufficient terminal blocks are provided. • Sufficient cross-connect wires are provided. 		

Preparing for Meridian Mail delivery

Introduction

The following arrangements should be made before equipment delivery:

- availability of unloading/unpacking facilities
- unobstructed access and transportation route from unloading area to equipment room
- transportation to premises
- availability of a list of the equipment ordered
- method of transportation from unloading area to equipment room

Heavy cabinets and equipment should be placed and unpacked in their final location at delivery time.

Equipment handling precautions

Introduction

Follow these guidelines when handling Meridian Mail equipment:

- When positioning or moving any cabinet or shelf, either on casters or with leveling feet, be sure to use sufficient manpower and exercise caution.
- The disk unit is heavy and should be handled with care.
- Handle cards by the edges only. Do not handle cards by the components or the edge connector. They are static-sensitive. Set cards down on an antistatic bag only.



CAUTION **Risk of damage to equipment**

Cards may become damaged if you do not wear an electrostatic discharge (ESD) wrist strap while handling the cards, attaching cables, or doing any other assembly or maintenance on the hardware. An ESD strap is included with the equipment. When using the ESD strap, be sure it is attached to a grounding point on the frame of the equipment.

- Do not remove or insert components from a node which is powered on.
- Do not place or store any materials (cables, manuals, packing material, and so on) on top of or below any equipment cabinet; they may restrict airflow.

Chapter 4

Web server setup

In this chapter

Overview	4-2
System requirements	4-3
Setting up third-party applications	4-6
Installing the software	4-7
Configuring features	4-8
Configuring Integrated Communications Links	4-9
Configuring SNMP	4-12
Network configuration	4-13

Overview

Introduction

There are several new features in Meridian Mail 13 that run on a PC.

The Personal Mailbox Administration (PMA) feature gives the mailbox owner the ability to view and, if necessary, modify mailbox settings using a web browser.

The Text Messaging and Notification feature provides the capability of sending a text message to an e-mail account, a PCS device, or a pager. It provides the ability to send and receive short alphanumeric messages of up to 160 characters.

The Simple Network Management Protocol (SNMP) has two system management features. The first system management feature is SNMP Notification that sends selected System Event and Error Reports (SEERs) as SNMP traps. The second system management feature is SNMP Reports. It provides information on the number of messages that are received, sent or failed. It also provide statistics for individual or combined sites.

This chapter provides information on the system, software, and PC requirements needed to set up the web server. This chapter also provides information on the system requirements for the web server.

Assumptions

This guide assumes that Meridian Mail is correctly installed and operational. For more information about configuring the Meridian Mail to support the Meridian Mail PC software, consult the *Meridian Mail PC Applications Guide*.

System requirements

Introduction

Depending on the application, Meridian Mail PC software requires a PC running Windows NT Server or Windows 95.

Refer to the following chart for information on each of the PC Applications.

PC Application	Windows 95	Windows NT
ICL	X	X
PMA		X
Text Messaging		X
SNMP	X	X

Hardware requirements

The minimum hardware requirements to run the Meridian Mail PC software are listed below. Hard disk space does not include the space required for third-party software:

- Pentium 90 or better
- minimum of 32 Mbytes memory
- hard disk space: 500 Mbytes on NTFS partition
- 800 x 600 pixel resolution monitor

Integrated Communication Link

- available COM port
- ethernet connection

PMA

- PMA installed on the Meridian Mail

Text Messaging requirements

- Text Notification feature installed on Meridian Mail
- One 16550 UART serial port and modem for dial-up notifications

SNMP support

- SNMP support installed on the Meridian Mail

Note: All of the PC Applications must be installed by a CD.

Software requirements

Meridian Mail PC Applications require the following third-party software:

- WinNT Server 4.0. Some applications can run on Windows 95 OSR 2 or later. For more information on platform requirements, see the Operating System section below.
- WinNT Server Service Pack 3
- WinNT Server 4.0 Option Pack
- Web Browser: IE 4.01 or Netscape 4 or later. (You must have Javascript, Java, cookies, and SSL enabled.)
- TCP/IP

Text Messaging requirements

- Microsoft Data ICL Components (MDAC) 2.1.1.3711.11 (GA) for x86
- IIS SMTP Service for e-mail notifications

SNMP support

- any network management system that is SNMP (version 1) compatible such as the M1 Meridian Administration Tool (MAT) or Hewlett-Packard's Openview
- SNMP service installed as a Windows NT Service to be started on boot up

Operating system

The following PC applications run on the Microsoft Windows NT 4.0 (or later) server with IIS 4:

- Personal Mailbox Administration (PMA)
- Text Messaging and Notification
- Simple Network Management Protocol (SMNP)

Note: While the above applications can only be run on a Windows NT server, they can be used by any computer connected to the network with an Internet browser.

The following Meridian Mail PC applications can run on the Microsoft Windows NT 4.0 or Windows 95 platform:

- Meridian Mail AutoAdmin
- Integrated Communication Link (ICL)
- SNMP Support for OMs
- SNMP Support for SEERS

Setting up third-party applications

Introduction

Before you can install the Meridian Mail PC application software, you need to install and configure your third-party applications.

The setup requirements for the PC server are itemized, followed by other software requirements:

1. Install Windows NT 4.0 SRV.
2. Install the Service Pack 3.
3. Install Internet Explorer 4.01 or later.
4. Install Option Pack 4 (including IIS 4).
5. Install Microsoft Data ICL Components (MDAC) 2.1.1.3711.11 (GA) for x86.

Refer to the appropriate Microsoft documentation for details. You can find the MDAC software on the Microsoft support website.

Security issues

To protect data, administrators should take the following precautions:

- All applications should be installed on an NTFS partition when installed on an NT server. FAT does not support security.
- You can set up a certificate server through IIS. This is recommended, particularly if you are administering web applications from a remote or unsecure site.
- You should set up directory security for your web-based applications. For more information, see Chapter 1, "Configuring Web-Based PC Applications."

Installing the software

Introduction

The Nortel Networks PC System Operations software can install, uninstall, and upgrade the Meridian Mail PC applications. Installation can be done via a CD or a network. The following Meridian Mail PC applications can be installed:

- Integrated Communication Link (ICL)
- Meridian Mail AutoAdmin
- Personal Mailbox Administration (PMA)
- SNMP Support for Network OMs
- SNMP Support for SEERs
- Meridian Text Messaging

Installation methods

You can install the PC software from the Web or from a CD. The SysOps software installs and uninstalls the PC applications.

Note: If the CD does not automatically start, use the Windows Explorer to view the contents of the CD. Double-click the Setup.exe file to start the SysOps software.

Configuring features

Introduction

After you install the Meridian Mail PC software, you need to configure each application.

The following applications start immediately after installation:

- AutoAdmin Configuration Utility
- Integrated Communication Link (ICL)
- SNMP Configuration Utility (configures SNMP for SEERS and SNMP for OM)

The following applications are web-based and must be configured before use:

- PMA
- Text Messaging

Assumptions

The configuration instructions assume the Meridian Mail is correctly installed and configured to support the PC Application software. For more information on configuring Meridian Mail to support the PC Application software, consult the *Meridian Mail PC Applications Guide*.

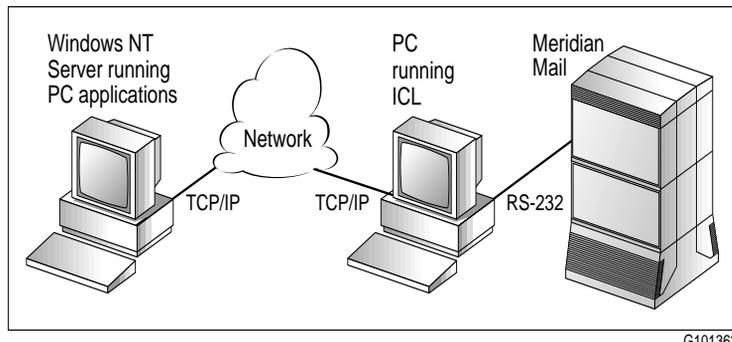
The configuration instructions also assume that the Windows NT Server and Internet Information Server are correctly installed and configured.

Specific changes in Windows NT and IIS needed to support the PC Applications are documented in the configuration instructions.

Configuring Integrated Communications Links

Introduction

The Integrated Communications Link (ICL) allows a PC to communicate with the Meridian Mail over an RS-232 cable. To use the Meridian Mail PC Applications software, at least one PC must have an ICL configured. The distance from the PC to the Meridian Mail system can not exceed 15.38 m (50 ft) as they are connected by a serial link.



All PC applications require an ICL to be set up except Meridian Mail Reporter and Alternate User Interface. ICLs are flexible: each ICL can support multiple PC applications, and PC applications can use one or more ICLs.

Configuring AutoAdmin

The AutoAdmin Configuration Utility sets up your PC so you can run the Meridian Mail AutoAdmin software. The Configuration Utility starts automatically after installing AutoAdmin through the SysOps Setup wizard.

Configuring web-based PC applications

The PMA and Text Messaging configurations can be done over a web browser.

Configuration requires several steps:

1. Create application administrators.
2. Configure directory security for web-based applications.
3. Configure IIS for web-based applications.

Note: For details on configuring your PC applications refer to the *Meridian Mail PC Applications Guide*.

- Before you begin** You must configure Windows NT and install Internet Information Server (IIS) to manage your web-based applications.
- Each mailbox must have the PMA feature enabled through the Administrator.
- Create application administrators** The first step is to create one or more Windows NT administrator accounts for your web-based applications. A web-based application administrator may be different than the administrator for the NT server.
- Refer to the *Meridian Mail PC Applications Guide* for more information on how to create application administrators.
- Configure directory security for web-based applications** You need to configure directory security for your web-based applications to protect them against malicious or accidental tampering.
- Refer to the *Meridian Mail PC Applications Guide* for more information on how to configure directory security for web-based applications.
- Configure IIS for web-based applications** To configure IIS, follow these steps:
1. Create Virtual Directories.
 2. Configure User Authentication.
 3. Configure Default Document.
- Create Virtual Directories**
- A virtual directory points to a real directory on the web server, but is easily accessed through a URL. For example, if there is a virtual directory called "PMA" on the web server "torweb," then a browser can reach the directory at `http://torweb/pma`.
- You must create separate virtual directories for PMA and Text Messaging.
- A virtual directory must be created for each Meridian Mail customer group.

Configure user authentication

If you are using Internet Explorer to configure your web-based applications, then your sessions are secure via Window NT's built-in security features.

Configure Default Document

Make sure that the file Default.asp is found in the Enable Default Document field.

Configuring SNMP

Introduction

The SNMP Configuration Utility configures the SNMP extension agents necessary to use SNMP to transmit SEERS and OM data. You need to configure SNMP support on the Meridian Mail.

There are four possible system configurations:

1. A PC containing both an SNMP agent and an SNMP manager is connected to a Meridian Mail switch using ICL over an RS-232 cable.
2. A PC containing an SNMP agent is connected to a Meridian Mail switch using ICL over an RS-232 cable. One or more SNMP managers communicate with the agent over the corporate network; that is, the Intranet.
3. A PC containing an SNMP agent is connected to a Meridian Mail switch using ICL over an RS-232 cable. One or more SNMP managers communicate with the agent through the corporate firewall over the public network; that is, the Internet.
4. A PC containing an SNMP agent is connected to a Meridian Mail switch using ICL over an RS-232 cable. One or more SNMP managers communicate with the agent through dial-up modems.

Network configuration

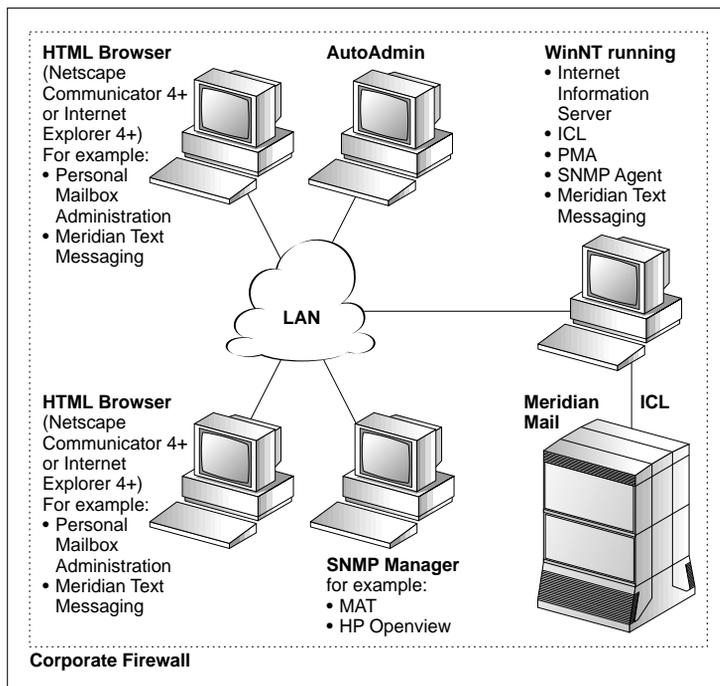
Introduction

The following section describe various network configurations.

Examples of networks

All of the following examples assume that they are being run behind a corporate firewall. For a more detailed breakdown of the PC application's minimum requirements refer to the *Meridian Mail PC Applications Guide*.

Basic configuration

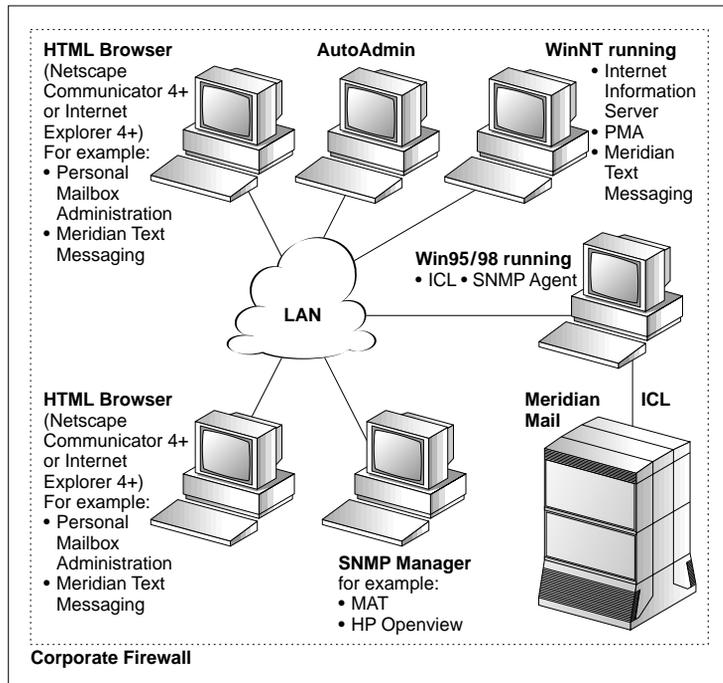


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- This configuration is desirable if you do not already have a web server running and you want to run all your Meridian Mail applications from one PC.

- Minimum requirement for WinNT running IIS and all PC applications: Pentium 90 CPU with 32 Mb RAM (64 Mbytes recommended), Windows NT 4.0 Server with Option Pack 4 and Service Pack 3 or 5 installed, 50 Mbytes of free disk space, CD-ROM drive, SVGA monitor, keyboard and mouse, one 16550 UART serial port for connection to Meridian Mail and an ethernet card and TCP/IP installed for connection to the LAN.
- One ICL port is required to be defined on Meridian Mail.

Basic configuration with separate web server

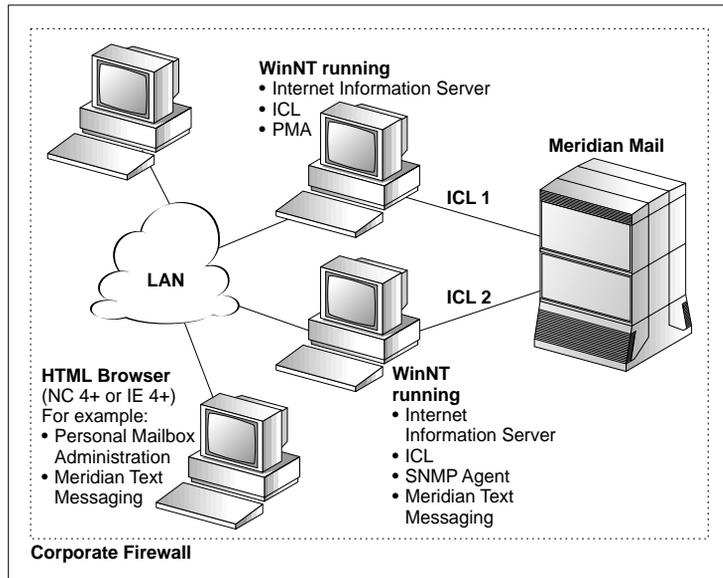


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- This configuration is desirable if you already have a web server running. You can then use a less expensive PC (with Windows 95/98) as a gateway to connect to your Meridian Mail system.
- Minimum requirement for Win95/98 running ICL & SNMP Agent: Pentium 90 CPU with 32 Mbytes RAM, Windows 95 with OSR2 installed or Windows 98, 15 Mbytes of free disk space, CD-ROM drive, SVGA monitor, keyboard and mouse, one 16550 UART serial port for connection to Meridian Mail and an ethernet card and TCP/IP installed for connection to the LAN.
- This configuration is desirable if you already have a web server running. You can then use a less expensive PC (with Windows 95/98) as a gateway to connect to your Meridian Mail system.

- Minimum requirement for Win95/98 running ICL & SNMP Agent: Pentium 90 CPU with 32 Mbytes RAM, Windows 95 with OSR2 installed or Windows 98, 15 Mbytes of free disk space, CD-ROM drive, SVGA monitor, keyboard and mouse, one 16550 UART serial port for connection to Meridian Mail and an Ethernet card and TCP/IP installed for connection to the LAN.

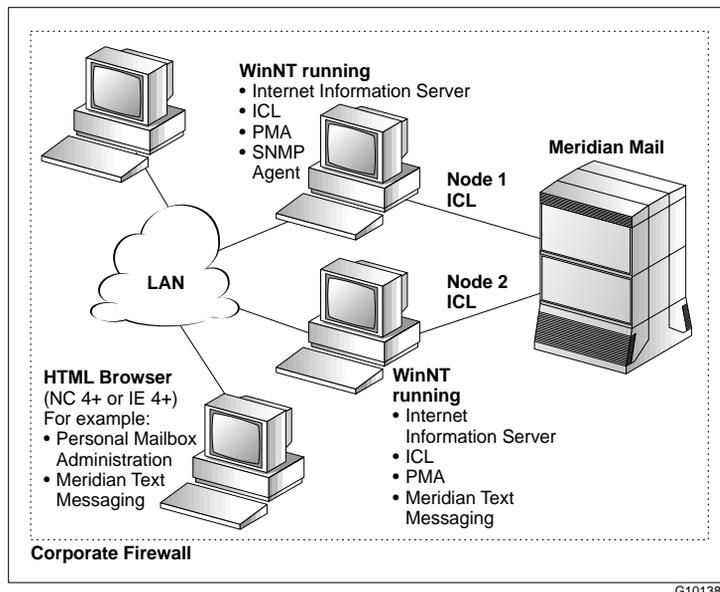
Multiple server configuration



G101383

- This configuration is desirable if you want to run a dedicated server for one of the PC applications (for example, PMA) and use the second PC for the other applications. This is sometimes desirable because you may want dedicated bandwidth for the solo PC application. The connected PCs can either be running Windows 95/98 or Windows NT.
- The minimum configuration of these PCs will be the same as for the Basic Configuration diagram.
- Two ICL ports are required to be defined on the same node of Meridian Mail. The Cumulative baud rate limitation on the node has to be observed.

Multiple server configuration with load sharing

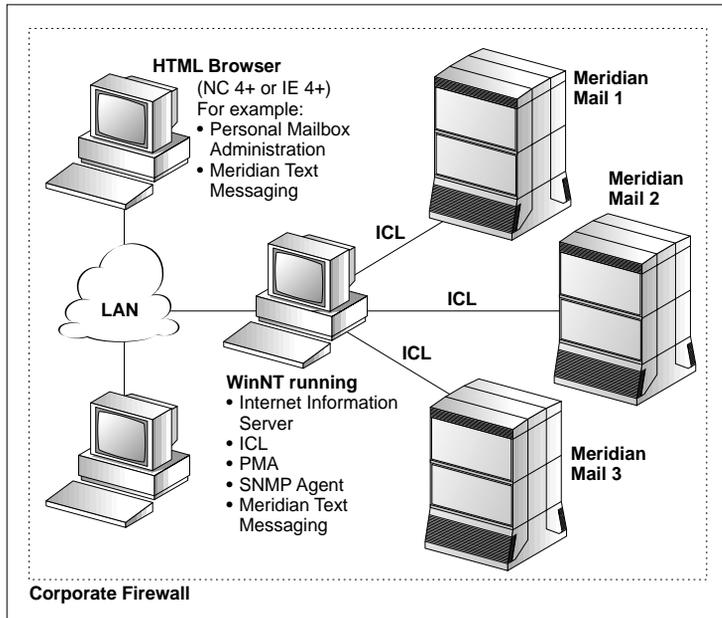


G101382

- This configuration is desirable if you have a multi-node system and you want to load share between 2 or more PCs. The connected PCs can either be running Windows 95/98 or Windows NT.
- The minimum configuration of these PCs will be the same as for the Basic Configuration diagram.
- Two ICL ports are required, one on each node of Meridian Mail.

Note: Both SNMP Agent and Text Messaging can only be run on *one* of the PCs.

Multiple Meridian Mail configuration with shared web server

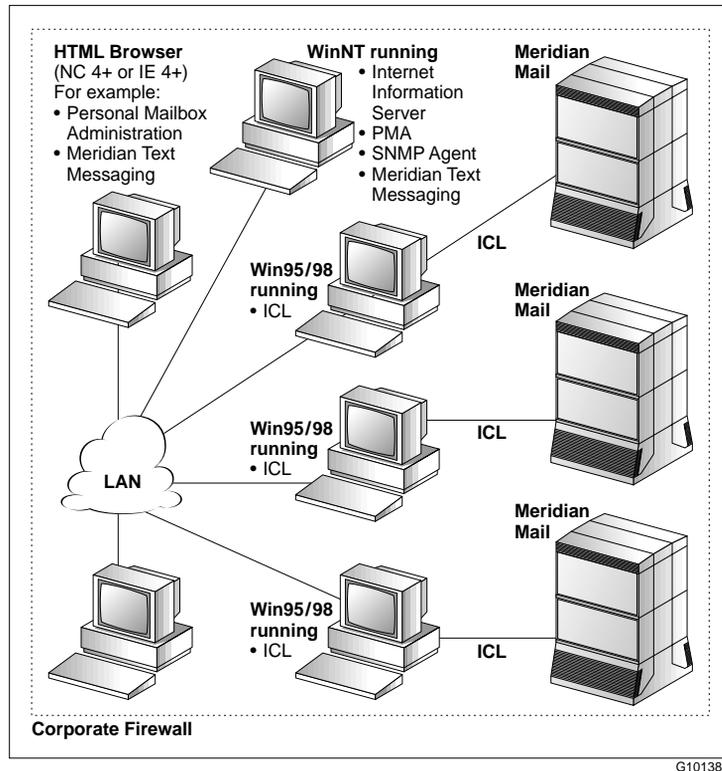


G101384

- This configuration is desirable if you have a number of Meridian Mail systems that are sitting very close to each other and you want to share the same PC among them. The connected PC can either be running Windows 95/98 or Windows NT.
- The minimum configuration of these PCs will be the same as for the Basic Configuration diagram.
- One ICL ports is required to be defined on each of the Meridian Mail systems.

Note: All Meridian Mail systems have to running Meridian Mail 13 and have the applicable PC applications installed.

Multiple Meridian Mail configuration with multiple links



G101385

- This configuration is desired if you have a network of Meridian Mail systems and you want to share the same web server PC among them. Although the connected PCs can either be running Windows 95/98 or Windows NT, Windows 95/98 is recommended in this case since it provides a less expensive alternative.
- The minimum configuration of these PCs will be the same as for the Basic Configuration diagram.
- One ICL port is required to be defined on each of the Meridian Mail systems.

Note: All Meridian Mail systems have to running Meridian Mail 13 and have the applicable PC applications installed.

Chapter 5

Planning spares requirements

In this chapter

Overview	5-2
Spares planning tables	5-3

Overview

Introduction

The table on the next page lists the mean time between failures (MTBF) for the field-replaceable components of the Meridian Mail system. The table on page 5-5 lists the number of spares of each item a branch should stock.

Some systems have multiples of the listed components. For example, an eight-port system has two four-port voice processor cards.

The MTBF of the disk drives used in Meridian Mail is 17 years for the 3.5-inch drives, 11 years for the 5.25-inch drives, and 5.7 years for the 8-inch drives. Note that this is the *mean time*. It does not mean that every drive can be expected to operate without failure for the full duration of this time.

Spares planning tables

Spares planning—Mean time between failures (MTBF)

Components serviced	Code	MTBF (years)
300-Mbyte disk	NT6D47AA	11.0
600-Mbyte disk	NT6D48AA	11.0
1-Gbyte disk	NT6D48BA	16.0
1-Gbyte disk/tape unit	NT6D49DA	16.0
2-Gbyte disk	NT6D48FA	16.0
MMP40	NTR45AA	15.0
HABC	NT4R08AA	26.0
GSP board	NT4R04AA	19.0
RSM	NT4R03AA/AB	34.0
DCEPS	NT6D41AA	187.0
Viper tape drive	NT6F45AA	6.8
2.5-Gbyte Tandberg tape drive unit	NT6D45CA	6.8
300-Mbyte disk and 2.5-Gbyte Tandberg tape drive unit	NT6D47EA	6.8
1.2-Gbyte disk and 2.5-Gbyte Tandberg tape drive unit	NT6D48EA	6.8
2.0-Gbyte disk and 2.5-Gbyte Tandberg tape drive unit	NT6D48GA	6.8
Total system	–	2.5

Note 1: The mean time between failure of disk drives is based on electrical failures and therefore not conclusive with regard to disk drive life expectancy. You should expect to replace the disk drive within five years.

Note 2: System MTBF uses the Markhov model. A component failure does not necessarily cause a system failure.

Note 3: The total system MTBF is based on a single node unshadowed 12-channel system.

Spares planning—Number of spares required

Components serviced	Code	Number of units serviced by branch *				
		1	<5	<10	<20	<30
300-Mbyte disk	NT6D47AA	1	2	3	4	4
600-Mbyte disk	NT6D48AA	1	2	3	4	4
1-Gbyte disk	NT6D48BA	1	2	3	3	3
1-Gbyte disk/tape unit	NT6D49DA	1	2	3	3	3
2-Gbyte disk	NT6D48FA	1	2	3	3	3
MMP40	NTR45AA	1	2	2	3	3
HABC	NT4R08AA	1	2	2	3	3
GSP board	NT4R04AA	1	2	2	3	3
RSM	NT4R03AA/ AB	1	2	2	3	3
DCEPS	NT6D41AA	1	2	2	3	3
Viper tape drive	NT6F45AA	1	2	2	3	3
2.5-Gbyte Tandberg tape drive unit	NT6D45CA	1	2	2	3	3
300-Mbyte disk and 2.5-Gbyte Tandberg tape drive unit	NT6D47EA	1	2	2	3	3
1.2-Gbyte disk and 2.5-Gbyte Tandberg tape drive unit	NT6D48EA	1	2	2	3	3
2.0-Gbyte disk and 2.5-Gbyte Tandberg tape drive unit	NT6D48GA	1	2	2	3	3
* Assumes that when a spare is committed, a replacement will be available within one week.						

Appendix A

Reference documents

In this appendix

Overview	A-2
Document list	A-3

Overview

Introduction

The following documents contain information that may be of value during the site planning and preparation process. If local or national codes conflict with those listed below, follow the local or national code.

Document list

- *Bellcore Technical Reference for Simplified Message Desk Interface (TR-NWT-000283)*
- *ANSI/IEEE Standard 484-1981*
- *ANSI/IEEE Standard 142-1982*
- *ANSI/IEEE Standard 81-1983*
- *Gaseous Hydrogen Systems 1984-NFPA 50A*
- *National Electrical Code (NFPA 70-1984)*
- *Grounding Electrode System (NEC Articles: 250-23, 250-26, 250-54, 250-81, 250-83, 250-84, and 250-86)*
- *Grounding Electrode Conductor (NEC Articles: 250-23, 250-26, 250-51, 250-53, 250-91, 250-92, and 250-94)*
- *Grounding Conductor (that is, Neutral) (NEC Articles: 250-26, 250-50, 250-51, 250-53, and 250-61)*
- *Equipment Grounding Conductor (NEC Articles: 250-50, 250-51, 250-53, 250-57, 250-91, 250-32, 250-92, and 250-95)*
- *Main Bonding Jumper (NEC Articles: 250-23, 250-26, and 250-61)*
- *Grounding Evaluation Practices and Equipment*, ECOS Electronics Corporation, 205 West, Harrison Street, Oak Park, IL U.S.A. 60304
- *Protection of Electronic Computer/Data Processing Equipment—NFPA 75*
- *MIL-Handbook-419* (raised floor installation requirements)
- *IEC 68-2-14 Test Nb* (temperature cycling)
- *OSHA Occupational Safety and Health Administration Standards* (29 CFR 1910)
- *Recommended Practice on Static Electricity—NFPA 77*
- *Soares Grounding Electrical Distribution Systems for Safety*
- *Uniform Building Code 1982*
- the most recent issues of local building codes

Appendix B

Component list

In this appendix

Overview	B-2
Component list	B-3

Overview

Introduction

This appendix identifies Meridian Mail equipment components that can be ordered individually.

Component list

Component	PEC code	Part no.	Order code
300-Mbyte disk pack	NT6D47AA	A0363255	—
300-Mbyte disk pack (Seagate ST3390N)	NT6D47BA	A0393283	—
300-Mbyte disk/tape unit	NT6D47DA	A0398354	—
600-Mbyte disk pack	NT6D48AA	A0365883	—
1.0-Gbyte disk pack	NT6D48BA	A0393824	—
1.0-Gbyte disk/tape unit	NT6D48DA	A0398355	—
1.2-Gbyte disk pack	NT6D48BA	A0393284	—
2.0-Gbyte disk pack	NT6D48FA	A0658264	—
2.0-Gbyte disk/tape unit	NT6D48GA	A0658265	—
Tape pack	NT6D45AA	A0363253	—
2.5-Gbyte Tandberg tape drive	NT6D45CA	A0629938	—
300-Mbyte disk/2.5-Gbyte Tandberg tape drive	NT6D47EA	A0629939	—
1.2-Gbyte disk/2.5-Gbyte Tandberg tape drive	NT6D48EA	A0629940	—
Tandberg tape drive cleaning kit	—	A0633585	—
HABC card	NT4R08AA	A0349541	—
HABC terminator	NT4R10AA	A0350736	—
RSM card	NT4R03AA	A0347860	—
MMP40 card	NT4R45AA	A0405603	—
MMP40 terminator	NT4R11AA	A0350737	—
MDCEPS	NTND05AA	A0389042	—
CEPS blank faceplate	NT7D06AA	A0363452	—
General signal processor (GSP)	NT4R04AB	A0349092	—
32K NVP Card*	NT4R01AC	A0364796	—
Power and cable equipment			
AC line cord assembly	P0642361	—	—
Ground extension cable	QCAD310	A0336878	—

Component	PEC code	Part no.	Order code
RSM fan-out cable	NT4R20AA	A0358325	—
RSM cable assembly	NT6D4406	A0363813	—
RSM alarm adapter cable	NT4R37AA	A0356901	—
25 Pair Voice cable, 7.69 m (25 ft.)	NT8D80AP	A0358917	—
SMDI cable	NT0X26PJ	—	—
Meridian Mail Bus cable	NT6D4415	A0364039	—
RS-232 straight cable, 3 m (10 ft.)	NTND91AA	A0399143	—
RS-232 straight cable, 7.69 m (25 ft.)	NTND91AB	A0399144	—
RS-232 modem cable, 3 m (10 ft.) (null-modem)	NTND82AA	A0398761	—
RS-232 modem cable, 7.69 m (25 ft.) (null-modem)	NTND82AB	A0398762	—
RS-232 printer cable	—	A0376171	—
RS-232 printer cable (for NT220 terminal)	NTND82AA	A0398761	—
SCSI cable	P0695169-05	—	—
Communications equipment			
HP 700/22 terminal (any VT220 compatible terminal may be used)	NT3M20AA	A0330842	—
VT520 monochrome text terminal (14 in. flat surface)	—	A0637761	—
A/B data switchbox	NT3M50AD	A0345353	—
Ven-Tel 2400-33 MNP/X.modem (Rev 5.2)	NT3M50AF	A0345963	—
Ven-Tel 9600plus	—	A0381458	—
2400-BPS UDS modem (EC 2440)	NT3M50AC	A0345346	—
Racal ALM 3223 modem	—	A0658286	—
Hayes Optima 144 modem	—	A0658287	—
U.S. Robotics Sportster 14.4 (model 268) modem	—	A0638645	—
NT personal printer	NT3M56AC	A0345125	—
DEC LA30N printer kit	NTZR40BA	A0654974	—
RSM assembly			

Component list

Component	PEC code	Part no.	Order code
RSM card	NT4R03AA	A0347860	—
RSM 4-port fan-out cable, 7.69 m (25 ft.)	NT4R20AA	A0358325	—
RSM alarm adapter cable	NT4R37AA	A0356901	—
RSM cable assembly	NT6D4406	A0363813	—
RSM to SDI cable, 4.92 m (16 ft.)	NE25MQ2A	A0237451	—
RS-232 straight cable, 7.69 m (25 ft.)	NTND91AB	A0399144	—
HP 700/22 terminal	NT3M20AA	A0330842	—
Meridian Mail Connections			
AT&T integration unit	—	A0380908	—
RSM card	NT4R03AA	A0347860	—
ROLM integration unit	—	A0383524	—
50-position EMI filter and mounting	—	A0361136	—
User guides			
Meridian Mail user guides (15)	NT5R25AA	A0403732	P0741311
Guest Administration Console/Guest Voice Messaging Guide	—	—	P0741307

Note: The Message Playback Speed Control feature does not work with the 16K NVP card.

Appendix C

Cable and wiring plan

In this appendix

Overview	C-2
Cable and wiring plan data form	C-3

Overview

Introduction

Use the form in this appendix to make notes on your cabling and wiring plan.

Cable and wiring plan data form

DN	LEN	Name	Features/ Remarks	Terminal device	Blocks	Color
						W/BL
						W/OR
						W/GR
						W/BR
						W/SL
						R/BL
						R/OR
						R/GR
						R/BR
						R/SL
						BK/BL
						BK/OR
						BK/GR
						BK/BR
						BK/SL
						Y/BL
						Y/OR
						Y/GR
						Y/BR
						Y/SL
						V/BL
						V/OR
						V/GR
						V/BR
						V/SL

Appendix D

Site survey checklist

In this appendix

Overview	D-2
Checklist	D-3

Overview

Introduction

This appendix contains a comprehensive site survey checklist to aid in planning your site installation.

Checklist

1. General information

() End user

Name: _____

Address: _____

City, State/Province: _____

Country, Zip/Postal code: _____

Telephone number: _____

Primary contact: _____

Secondary contact: _____

() Distributor

Name: _____

Address: _____

City, State/Province: _____

Country, Zip/Postal code: _____

Telephone number: _____

Primary contact: _____

Secondary contact: _____

2. Delivery information

- () Address: _____
City, State/Province: _____
Country, Zip/Postal code: _____
Telephone number: _____
Primary contact: _____
Secondary contact: _____
Vehicle restrictions: _____
Permits required: _____
Hours of delivery: _____
- () Security clearance: _____
- () Freight company: _____
- () Pre-delivery notification _____
Hours for delivery: _____
Contact person: _____ Telephone number: _____
- () Unloading/Unpacking
Equipment required: _____
Responsible party: _____
- () Equipment route: _____
- () Delivery constraints: _____
- () Elevator: ___ Capacity: _____

Checklist

3. Software considerations

- () Current Meridian Mail software release: _____
- () Current system size (number of voice ports or voice port equivalents): _____
- () Current system size in terms of storage hours: _____
- () Current DMS software release: _____
BCS (Batch Change Supplement) 28 required
- () PBX software packages equipped
- () SMD

4. Meridian Mail model considerations (See Chapter 1 "Determining system size" in this manual for configurations.)

Number of Meridian Mail basic-service voice ports required: _____

Number of Meridian Mail full-service voice ports required: _____

Number of Meridian Mail multimedia ports required: _____

Hours of voice storage (for messages) required: _____

Hours of voice storage (for menus/services) required: _____

Number of voice users: _____

5. Meridian Mail optional services desired

Primary language (1): _____

Extra/Alternate language (2): _____

Extra/Alternate language (3): _____

Extra/Alternate language (4): _____

(See your representative for a list of available languages.)

Voice Menus Yes () No ()

Networking Yes () No ()

Meridian Mail ICL Yes () No ()

AdminPlus/Meridian Mail Reporter Yes () No ()

Outcalling Yes () No ()

Fax Outcalling Yes () No ()

AMIS Yes () No ()

Voice Forms Yes () No ()

Multi-SMDI Yes () No ()

Multiple Administration Yes () No ()

Multi-Customer Yes () No ()

Bilingual Prompting Yes () No ()

Meridian Mail Connections Yes () No ()

Install/Data Tape Yes () No ()

Backup Tape(s) Yes () No ()

Keycode Available Yes () No ()

Checklist

6. Hardware

Switch equipment cabinets	Quantity	Type

() Switch requirements

IOC card required: Yes () No ()

7. Equipment room information

() Existing floor plan: Yes () No ()

8. Power and ground considerations

() Calculate maximum cable distance

PBX/DMS to Meridian Mail (link cable): _____

RS-232 (< 15.38 m [50 ft.]) Yes ()

LDM (15.38–1231 m [50–4000 ft.]) Yes ()

*Meridian Mail to A/B switchbox: _____ 7.69 m (25 ft.) maximum

*A/B switchbox to Admin terminal: _____ 7.69 m (25 ft.) maximum

*A/B switchbox to modem: _____ 7.69 m (25 ft.) maximum

Modem to phone jack: _____

Printer to Admin terminal: _____ 15.38 m (50 ft.) maximum

*If you are using Meridian Mail Reporter on the PC, or the internal modem, these cables are not used. Check for the applicable cables in the *Meridian Mail Reporter User Guide*.

9. Current environmental conditions

() Equipment room cooling

Type: _____ Ambient temperature: _____

() Humidifier/Air conditioner: _____

() Customer restrictions: _____

Notes on current environmental conditions:

10. Additional considerations

Does the existing PBX/DMS installation conform to NTP and Product Bulletins? Yes () No ()

Does the end user have any complaints with the existing PBX/DMS? Yes () No ()

Does the end user have any complaints with the existing Meridian Mail system? Yes () No ()

Appendix E

Data forms and site log form

In this appendix

Overview	E-2
Data forms	E-4
Site log form	E-28

Overview

Introduction

This appendix contains data entry forms that help in the planning and configuration of Meridian Mail. They should be completed by the customer or distributor when planning the system installation. The appendix includes

- **System Data Form (SYS-1)** This form contains basic configuration information for Meridian Mail and the PBX/DMS/SL100.
- **Meridian Mail LENSs (SYS-2)** This is a table for planning the port locations and the corresponding LENSs.
- **DMS-100/SL-100 Data Form (DMS-1)** This form contains data corresponding to DMS-100 or SL-100 prompts that require an entry. This data should be written in before initiating the system start-up procedures.

The filled-in DMS-100/SL-100 Data Forms should be used with the *Installation and Maintenance Guide* (NTP 555-7031-210555-7051-250). The person inputting DMS-100/SL-100 data must be familiar with the use of the DMS-100/SL-100 overlay programs.

- **Meridian Mail Connections Data Form (MMC-1)** This form contains data corresponding to PBX prompts that require an entry. This data should be written in before initiating the system start-up procedures. The person inputting the data must be familiar with the use of the overlay programs.
- **Meridian Mail Data Forms (MM-x)** These forms contain administrative information for the initial configuration of Meridian Mail voice messaging, and information on the configuration of optional services (for example, Voice Services or Networking). Each data form refers to the Meridian Mail NTP that provides more detailed instruction and description. For references to the *System Administration Guide*, refer to the section called “NTP references” in the “About this document” chapter for the NTP number of the Guide that corresponds to your system. Also, the default values or responses are listed on the data form where possible. These are the default values that

would appear on the screen during data entry, or the values that are assumed if no entry is made. For fields where you are required to choose from a list of options (for example, Enabled or Disabled, Yes or No), the default is underlined.

- ***Site Log Form (LOG-1)*** This form contains blank space in which to record significant events, service calls, known problems, and work-around procedures. It can serve as a place to keep release notes, problem reports, and configuration notes.

Data forms

System data form		SYS-1
Customer: _____	Rep: _____	
Customer rep: _____	Location: _____	
Date: _____	Job #: _____	Meridian Mail release: _____
System DNs	<u>Default</u>	<u>Site</u>
Voice Messaging (Full-Service Voice) ACD DN:	3600	_____
Express Messaging ACD DN: (if service is desired)	3601	_____
Prompt Maintenance ACD DN: (if Voice Menus are installed)	3601	_____
Basic-Service Voice ACD DN: (Voice Menus, ICL)	3602	_____
Full-Service Multimedia ACD DN: (if Fax on Demand is installed)	3603	_____

Meridian Mail LENS (Message Desk—Terminal)					SYS-2
Port number	Basic or full	Voice or multimedia	Message desk	Terminal	UCD DN XXXX
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					

Meridian Mail LENS (Message Desk—Terminal)					SYS-2
Port number	Basic or full	Voice or multimedia	Message desk	Terminal	UCD DN XXXX
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					
41					
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					
61					

Meridian Mail LENS (Message Desk—Terminal)					SYS-2
Port number	Basic or full	Voice or multimedia	Message desk	Terminal	UCD DN XXXX
62					
63					
64					
<p>The DMS DN and Meridian Mail system DNs should not conflict with existing DNs in the DMS numbering plan. If the system DNs are not provided with the customer order, the defaults are used.</p> <p>Voice ports must be filled sequentially starting at number 1. For example, for an eight-port system, the ports must be filled in the order 1, 2, 3, 4, 5, 6, 7, then 8, using available LENS.</p> <p>Voice ports must be filled sequentially starting at number 0. For example, for an eight-port system, the ports must be filled in the order 0,1, 2, 3, 4, 5, 6, then 7, using available TNs. For example,</p> <p>63-1 (Basic Voice) 63-2 (Full Voice) 63-3 (Full Voice) 63-4 (Full Voice) 63-5 (Full Voice) 63-6 (Full Voice) 63-7 (Full Voice) 63-8 (Full Voice)</p> <p>Multimedia ports use two LENS. When you list a multimedia port, the terminal portion of the LEN for the next port should increase by 2. For example,</p> <p>63-1 (Basic Voice) 63-2 (Full Multimedia) 63-4 (Full Multimedia) 63-6 (Full Voice) 63-7 (Full Voice) 63-8 (Full Voice)</p>					

DMS-100/SL-100 data form**DMS-1**

Customer: _____ Nortel rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains all site-specific data required to configure the DMS-100 or SL-100 for Meridian Mail. Only the prompts specific to this Meridian Mail configuration are listed below. For more information on these overlays, see the *Installation and Maintenance Guide* (NTP 555-7051-250) and *Simplified Message Desk Interface Setup and Operation* (NTP 297-2001-104).

Table	Prompt	Site response	Comments
TERMDEV	TERMDDES	_____	SMDI link device name (1-8 characters)
	IOCNO	_____	I/O controller number of the terminal device
	CKTNO	_____	I/O controller circuit number of the terminal device
SLLNKDEV	DEVNAME	_____	Name of the device used in LNKUTIL
UCDGRP	UCDNAME	_____	Assign a 1–16 character name to the UCD group
	CUSTGRP	_____	Name of the customer group to which the UCD group belongs
	PRIOPRO	_____	Maximum time calls can wait in a queue (0–255 s)
	MAXPOS	_____	Number of Meridian Mail ports
	MAXCQSIZ	_____	Number of Meridian Mail ports
	MAXWAIT	_____	Maximum time a call waits in incoming queue before answer (0–1800 s)
WRDN	DNNM	_____	SVGNPA, NNX and DEFGDIGS values
IBNXLA	XLANAME	_____	Name of the translator (1-8 characters)
	DGLIDX	_____	ICL code for the special feature
(Service Order)	DN	_____	Enter the Meridian Mail directory number
	Group	_____	CLLI code of the IBN Customer Group
	SUBGRP	_____	Subgroup number
	NCOS	_____	Network class of service
	SNPA	_____	Service numbering plan area of the DN
	LEN	_____	Line equipment number
	SMDI_UCDGRP	_____	UCD group of lines
OFCENG	CHA	_____	FTRG2WAREAS value for CHA
	CHA	_____	FTRG2PERMS value for CHA

Meridian Mail Connections data form **MMC-1**

Customer: _____ Nortel rep: _____
 Customer rep: _____ Location: _____
 Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for installing Meridian Mail Connections. For more information, see the relevant *VoiceBridge Installation* guide (NTP 555-7001-216/217/218). Possible values for the fields are listed where appropriate.

Basic parameters

Possible values

Number of ports:	_____	001 to 140
Message desk number:	_____	001 to 063
CPID extension length:	_____	2 to 7
CPID pad string:	_____	
MWI extension length:	_____	2 to 7
MWI pad string:	_____	
MWI feature:	_____	Disabled or Enabled
MWI interleave:	_____	1 to 5
Call sequence:	_____	Data or Call

Dial plan information

Port 1	LTN:	_____	0001 to 2047
	Extension:	_____	
.			
.			
.			
Port 1	LTN:	_____	0001 to 2047
	Extension:	_____	

Advanced features:

MWI Compress:	_____	On or Off
Answer Delay (ms):	_____	0 to 1000
Call Distribution:	_____	Rotary or Linear

General options data form (for single-customer systems)

MM-1

Customer: _____ Rep: _____
 Customer rep: _____ Location: _____
 Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*. Default responses are underlined.

Fields

Possible values

System general options (for single-customer systems)

System name:	_____	PBX customer name
System addressing length:	_____	(0 to 18)
Voice Menus & Announcements:	_____	<u>Disabled</u> or Enabled
Voice Forms:	_____	<u>Disabled</u> or Enabled
Fax on Demand:	_____	<u>Disabled</u> or Enabled
Meridian Mail Networking:	_____	<u>Disabled</u> or Enabled
Class of Service selection:	_____	(up to 15 COSs)
Attendant DN:	_____	(default 0, up to 30 digits)
Date format for administration and maintenance reports:	_____	<u>mm/dd/yy</u> yy/mm/dd dd/mm/yy
SEER printing:	_____	Disabled or <u>Enabled</u>
SEER printer port name:	_____	Blank implies the console port
Reports printer port name (for OM reports and general printing from the administration menus):	_____	Blank implies the console port

Note: The General Options screen will contain additional fields that are read-only. All the modifiable fields are listed above. In addition, the modifiable fields will already contain the default value (if there is one) that can be modified, if necessary, or left as is.

General options data form MM-2 (for system administration on multi-customer systems)

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*. Default responses are underlined.

Fields**Possible values****System general options****(for system administration in a multi-customer system)**

System name: _____ PBX customer name

System DN length: _____ (0 to 18)

ICL default customer number
(only if ICL is installed): _____ PBX customer no.

Class of Service selection: _____ (up to 15 COSs)

Date format for administration and
maintenance reports: _____ mm/dd/yy yy/mm/dd
dd/mm/yySEER printing: _____ Disabled or EnabledSEER printer port name: _____ Blank implies the
console portReports printer port name (for OM reports and
general printing from the administration menus): _____ Blank implies the
console port

Note: The General Options screen will contain additional fields that are read-only. All the modifiable fields are listed above. In addition, the modifiable fields will already contain the default value (if there is one) that can be modified, if necessary, or left as is.

General options data form MM-3 (for customer administration on multi-customer systems)

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*. Default responses are underlined.

Fields**Possible values****System general options (for customer administration in a multi-customer system)**

System name:	_____	PBX customer name
System DN length:	_____	(0 to 18)
ICL default customer number (only if ICL is installed):	_____	PBX customer no.
Customer name:	_____	Up to 30 characters
Customer number:	_____	Up to 4 characters
Customer type (Residential is valid for DMS or SL-100 systems; Hospitality is valid for Meridian 1 systems:).	_____	<u>Private</u> , Residential, or Hospitality
Multi-Customer:	_____	<u>Disabled</u> or Enabled
Multiple Administration Terminals:	_____	<u>Disabled</u> or Enabled
Disk-to-disk backup:	_____	<u>Disabled</u> or Enabled
Meridian ICL:	_____	<u>Disabled</u> or Enabled
AdminPlus (Meridian Mail Reporter):	_____	<u>Disabled</u> or Enabled
Integrated Mailbox Administration:	_____	<u>Disabled</u> or Enabled
Voice Messaging:	_____	<u>Disabled</u> or Enabled
AMIS:	_____	<u>Disabled</u> or Enabled
Dual Language Prompting:	_____	<u>Disabled</u> or Enabled
Outcalling:	_____	<u>Disabled</u> or Enabled
Voice Menus & Announcements:	_____	<u>Disabled</u> or Enabled
Voice Forms:	_____	<u>Disabled</u> or Enabled
Fax on Demand:	_____	<u>Disabled</u> or Enabled
Meridian Mail Networking:	_____	<u>Disabled</u> or Enabled

-continued-

**General options data form (continued)
(for customer administration on multi-customer systems)****MM-3**

Class of Service selection:	_____	(up to 15 COSs)
Attendant DN:	_____	(default 0, up to 30 digits)
Date format for administration and maintenance reports:	_____	<u>mm/dd/yy</u> yy/mm/dd dd/mm/yy
SEER printing:	_____	Disabled or <u>Enabled</u>
SEER printer port name:	_____	Blank implies the console port
Reports printer port name (for OM reports and general printing from the administration menus):	_____	Blank implies the console port

Note: The General Options screen will contain additional fields that are read-only. All the modifiable fields are listed above. In addition, the modifiable fields will already contain the default value (if there is one) that can be modified, if necessary, or left as is.

-end-

Voice messaging options data form MM-4 (for MMUI systems)

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*. Default responses are underlined.

Fields**Possible values****Voice messaging options (for MMUI single-language systems)**

Maximum delay for timed delivery (days):	_____	Range 0-365, default 31
Name dialing and name addressing:	_____	Disabled or <u>Enabled</u>
Prefix for name dialing and name addressing:	_____	Range 01–99, default 11
Broadcast mailbox number:	_____	Up to 18 digits, default 999
Billing DN:	_____	Up to 30 digits, default null
* Dialing prefix for outgoing calls:	_____	Up to 30 digits, no default
Customer DN Length:	_____	Up to 30 digits, default 0
*Local addressing lengths (leave blank if system DN length on General Options screen is 0):	_____	Must be less than System DN length; one or two lengths can be specified
Default message delivery priority (this field appears only if Meridian Networking is installed and enabled):	_____	<u>Standard</u> or Economy
Mailbox full warning threshold (percentage):	_____	Default is 0
Maximum read message retention (days):	_____	Range 0–31, default 7, 0 means no limit

* These fields appear only during customer administration on a multi-customer system.

Note: The Voice Messaging Options screen will contain additional fields that are read-only. All the modifiable fields are listed above. In addition, the modifiable fields will already contain the default value (if there is one) that can be modified, if necessary, or left as is.

Voice messaging options data form MM-5 (for VMUIF systems)

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*. Default responses are underlined.

Fields**Possible values****Voice messaging options (for VMUIF single-language systems)**

Lockout revert DN: _____	Up to 30 digits, default is null (no Revert DN)
Personal distribution list prefix: _____	Range 1–99, default 14
Name dialing and name addressing: _____	Disabled or <u>Enabled</u>
Prefix for name dialing and name addressing: _____	Range 1–99, default 14
Broadcast mailbox number: _____	up to 18 digits, default 999
Billing DN: _____	Up to 30 digits, default null
* Dialing prefix for outgoing calls: _____	Up to 30 digits, no default
Customer DN length: _____	Up to 30 digits, default 0
* Local addressing lengths (leave blank if System DN length on General Options screen is 0): _____	Must be less than System DN length; one or two lengths can be specified
Maximum read message retention (days): _____	Range 0–31, default 7, 0 means 99 days or until the user deletes them

* These fields appear only during customer administration on a multi-customer system.

Note: The Voice Messaging Options screen will contain additional fields that are read-only. All the modifiable fields are listed above. In addition, the modifiable fields will already contain the default value (if there is one) that can be modified, if necessary, or left as is.

Voice security option (for single-customer systems)

MM-6

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*.

Voice security options fields

Possible values

Password Prefix: _____ 4 digits, no default
 Maximum Invalid Logon Attempts Permitted per session: _____ Range 1–99, default 3
 Maximum Invalid Logon Attempts Permitted per mailbox: _____ Range 1–99, default 9
 # Maximum Days Permitted Between Password Changes: _____ Range 0–90, default 0
 # Password Expiry Warning (days): _____ Range 0–60, default 5
 # Minimum Number of Password Changes Before Repeats: _____ Range 0–5, default 5
 # Minimum Password Length: _____ Range 4–16, default 4
 # Call Answering/Express Messaging Thru-Dial restriction/permission codes: _____ Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2

On_switch restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each) (read-only for customer administration):

Restriction codes: 0 1 2 3 4 5 6 7 8 9

Permission codes: _____

Local restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each) (read-only for customer administration):

Restriction codes: 0 1 2 3 4 5 6 7 8 9

Permission codes: _____

Long_distance_1 restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each):

Restriction codes: 0 1 2 3 4 5 6 7 8 9

Permission codes: _____

Long_distance_2 restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each):

Restriction codes: 0 1 2 3 4 5 6 7 8 9

Permission codes: _____

These fields appear only for MMUI systems.

Voice security options (for multi-customer systems)

MM-7

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*.

Voice security options fields

Possible values

- * Password Prefix: _____ 4 digits, no default
- * Maximum Invalid Logon Attempts Permitted per session: _____ Range 1–99, default 3
- * Maximum Invalid Logon Attempts Permitted per mailbox: _____ Range 1–99, default 9
- # * Maximum Days Permitted Between Password Changes: _____ Range 0–90, default 0
- # * Password Expiry Warning (days): _____ Range 0–60, default 5
- # * Minimum Number of Password Changes Before Repeats: _____ Range 0–5, default 5
- # * Minimum Password Length: _____ Range 4–16, default 4
- # * Call Answering/Express Messaging Thru-Dial restriction/permission codes: _____ Unrestricted,
On_switch, Local, Long_distance_1,
Long_distance_2

On_switch restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each) (read-only for customer administration):

**Restriction codes: 0 1 2 3 4 5 6 7 8 9

**Permission codes: _____

Local restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each) (read-only for customer administration):

**Restriction codes: 0 1 2 3 4 5 6 7 8 9

**Permission codes: _____

Long_distance_1 restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each):

**Restriction codes: 0 1 2 3 4 5 6 7 8 9

**Permission codes: _____

Long_distance_2 restriction/permission codes (restriction codes are 0 to 9 by default, permission codes are 1 to 5 digits each):

**Restriction codes: 0 1 2 3 4 5 6 7 8 9

**Permission codes: _____

- # *These fields appear only for MMUI systems.*
- * *These fields do not appear during system administration on multi-customer systems.*
- ** *These fields are read-only during customer administration on multi-customer systems.*

Mailbox Class of Service data form MM-8 (for MMUI systems)

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data required for Meridian Mail configuration. For more information, see the *System Administration Guide*. Default responses are underlined.

Mailbox Class of Service fields**Possible values**

Class of Service Number (automatically generated by the system)	_____	Up to 30 characters
Class of Service Name:	_____	Yes or <u>No</u>
Personal Verification Changeable by User:	_____	Range 1-360, default 3
Voice Storage Limit (minutes):	_____	00:30 to 99:00, 10
Maximum Message Length (mm:ss):	_____	second increments; default 03:00
Delayed Prompts:	_____	<u>Yes</u> or No
Dual Language Prompting (this field appears only on multilingual systems):	_____	Yes or <u>No</u>
Auto Logon:	_____	Yes or <u>No</u>
Administrator Capability:	_____	Yes or <u>No</u>
Auto Play:	_____	Yes or <u>No</u>
Callers Notified of Busy Line:	_____	Yes or <u>No</u>
Maximum Call Answering Message Length (mm:ss):	_____	00:30 to 99:00, 10 second increments; default 01:00
Receive Composed Messages:	_____	<u>Yes</u> or No
Receive External Messages:	_____	<u>Yes</u> or No
Message Waiting Indicating Options:	_____	None, <u>Any</u> , or Urgent
External Call-Sender Restriction/Permission Codes:	_____	Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2
Maximum Read Message Retention (days):	_____	Range 0-31, default 0, 0 means 99 days or until the user deletes them
Broadcast Capability:	_____	Yes or <u>No</u>
Send Messages to External Users:	_____	Yes or <u>No</u>
Retain Copy of Sent Messages:	_____	Yes or <u>No</u>

-continued-

Mailbox Class of Service (continued) (for MMUI systems)		MM-8
Mailbox Class of Service fields		Possible values
Delivery to Non-Users Capability:	_____	Yes or <u>No</u>
* Delivery to Non-User Restriction/Permission Codes:	_____	Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2
* Send Message via DNU if Mailbox Not Found:	_____	Yes or <u>No</u>
* DNU DTMF Confirmation Required:	_____	Yes or <u>No</u>
Remote Notification Capability:	_____	Yes or <u>No</u>
** Remote Notification Restriction/Permission Codes:	_____	Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2
Remote Notification Retry Limits and Frequency		
Busy Retry Limit:	_____	0–10, default 3
** Busy Retry Interval:	_____	00:00 to 23:59
No Answer Retry Limit:	_____	0–10, default 10
No Answer Retry Interval:	_____	00:00 to 23:59
Answered Retry Limit:	_____	0–10, default 1
Answered Retry Interval:	_____	00:00 to 23:59
RN Business Days:		
Sunday	_____	Yes or <u>No</u>
** Monday	_____	<u>Yes</u> or No
Tuesday	_____	<u>Yes</u> or No
Wednesday	_____	<u>Yes</u> or No
Thursday	_____	<u>Yes</u> or No
Friday	_____	<u>Yes</u> or No
Saturday	_____	Yes or <u>No</u>
Receive AMIS messages:	_____	Yes or <u>No</u>
# Compose/Send AMIS messages:	_____	Yes or <u>No</u>
# AMIS Restriction/Permission Codes:	_____	Unrestricted, ! # On_switch, Local, Long_distance_1, Long_distance_2
External Dialing Restriction/Permission Codes:	_____	Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2
Custom Revert Restriction/Permission Codes:	_____	Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2
* These fields appear only if Delivery to Non-Users Capability is set to "Yes."		
** These fields appear only if Remote Notification Capability is set to "Yes."		
# These fields appear only if AMIS Networking is installed.		
! This field appears only if Compose/Send AMIS messages is set to "Yes."		
-end-		

Voice services data form**MM-9**

Customer: _____ Rep: _____
 Customer rep: _____ Location: _____
 Date: _____ Job #: _____ Meridian Mail release: _____

This form contains guidelines for Voice Services configuration. For more information, see the *Voice Menus Application Guide* (NTP 555-7001-325).

Voice services profile

Command entry time-out: _____ default 3.5 seconds
 Short disconnect time-out (time with no user response): _____ default 10 seconds
 Record time-out: _____ default 2 minutes
 Maximum prompt size for announcements: _____ default 30 seconds
 Maximum prompt size for other voice recordings: _____ default 2 minutes
 Act on AMIS initiation tone (only if AMIS installed): _____ Yes or No, default is No
 Enable update logging: _____ Yes or No, default is No
 Business hours: _____ default 08:30 to 17:00

Holidays	Start date	End date	Start time	Comments
1	_____	_____	_____	_____
2	_____	_____	_____	_____
3	_____	_____	_____	_____
4	_____	_____	_____	_____
5	_____	_____	_____	_____
6	_____	_____	_____	_____
7	_____	_____	_____	_____
8	_____	_____	_____	_____
9	_____	_____	_____	_____
10	_____	_____	_____	_____
11	_____	_____	_____	_____
12	_____	_____	_____	_____

(up to 20 holidays)

Voice Form Definition data form**MM-10**

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains guidelines for defining a voice form. For more information, see the *Voice Forms Application Guide* (NTP 555-7001-326).

Voice form ID: _____

Title: _____

Transcription password: _____ (4 to 16 digits)

Form name recorded (Yes or No) (read-only; indicates whether or not the voice form prompts have been recorded)

Maximum untranscribed responses: _____ (1000 or less is recommended)

Overflow handling DN: _____ (1 to 30 digits; the symbols #, *, (,), -, _, \$ are also allowed, but can't start with \$)

New responses notification DN: _____ (1 to 30 digits; the symbols #, *, (,), -, \$ are also allowed, but can't start with \$)

New responses SMDI link name: _____

Special responses notification DN: _____ (1 to 30 digits; the symbols #, *, (,), -\$ are also allowed, but can't start with \$)

Special responses SMDI link name: _____

Transcription field separator: _____ (Field Name, Tone, or Silence)

Default field separator delay: _____ (Stop, or Delay _____ deciseconds)

Play envelope for header: _____ (No or Yes)

Delay after header (deciseconds): _____ (0 to 32767)

Caller confirmation mode: _____ (None, At Each Field, or Whole Form)

Default revert DN: _____ (1 to 30 digits; the symbols #, *, (,), -, \$ are also allowed, but can't start with \$)

Caller "0" allowed: _____ (No or Yes)

System messages file (this field appears only on systems with more than one language installed): _____ (English or French)

Voice Menu Definition data form

MM-11

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains guidelines for defining a voice menu and planning the greeting and the menu choices. For more information, see the *Voice Menus Application Guide* (NTP 555-7001-325).

Voice Menu ID: _____ (up to 8 digits)

Title: _____ (up to 29 characters)

Revert DN: _____ (Optional)

ICL password: _____ (Optional, 4 to 16 digits)

Update password: _____ (Optional, 4 to 16 digits)

Greeting recorded (Yes or No) (read-only; indicates whether or not the menu greeting has been recorded)

Menu choices recorded (Yes or No) (read-only; indicates whether or not the menu choices have been recorded)

Silent disconnect: _____ (Yes or No)

Language for prompts (this field appears only if multiple languages are installed on your system): _____

Key	Action	Comment
1	_____	_____
2	_____	_____
3	_____	_____
4	_____	_____
5	_____	_____
6	_____	_____
7	_____	_____
8	_____	_____
9	_____	_____

Initial No response: _____

Delayed response: _____

-continued-

Announcement Definition data form MM-12

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains guidelines for defining a voice menu and planning the greeting and the menu choices. For more information, see the *Voice Menus Application Guide* (NTP 555-7001-325).

* Customer number: _____ (PBX customer number)

* Customer name: _____ (PBX customer name)

Announcement ID: _____ (up to 8 digits)

Title: _____ (up to 29 characters)

Revert DN: _____ (Optional)

ICL password: _____ (Optional, 4 to 16 digits)

Update password: _____ (Optional, 4 to 16 digits)

Announcement recorded (Yes or No) (read-only; indicates whether or not the announcement has been recorded)

Language for prompts (this field appears only if multiple languages are installed on your system): _____

Announcement (Plan what you want to record. This will not appear on the Announcement Definition screen.)

**These fields appear only during system administration on a multi-customer system.*

Fax Item Definition data form**MM-13**

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains guidelines for defining a fax item. For more information, see the *Fax on Demand Application Guide* (NTP 555-7001-327).

Fax Item ID: _____ (1 to 8 digits)

Title: _____ (up to 29 characters; do not use _, +, or ?)

ICL Password: _____ (0 to 16 digits; default is blank, which means no password required)

Update Password: _____ (0 to 16 digits; default is blank, which means the fax item cannot be updated)

Language for prompts (this prompt appears on multilingual systems only): _____ (choose from the listed available languages)

Confirmation prompt recorded (Yes or No) (read-only; indicates whether or not the confirmation prompt has been recorded)

Fax content stored (Yes or No) (read-only; indicates whether or not the fax item has been stored)

Confirmation prompt modifiable via telephone set: _____ (Yes or No, default is No)

Verification fax number: _____ (the default fax number to send verification to when fax item content is changed)

Verification fax number modifiable via telephone set: _____ (Yes or No, default is No)

Verification contact ID: _____ (up to 31 characters for the name and/or phone number to appear on the cover of the call back verification fax)

Confirmation prompt (plan what you intend to record as the confirmation prompt when loading the fax item as this will not appear on the Fax Item Definition screen):

Networking data form (part 1)**MM-14**

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data for Networking configuration. For more information, see the Meridian Networking administration chapter in the *Networking Services Administration Guide* (NTP 555-7001-335).

Networking DN: _____
 Networking modem DNs: _____ (up to 20)

Site Networking administration parameters (copy this form and repeat for local and remote sites)

Site number: _____ Range 1–500
 Site name: _____ Max. 32 characters
 Dialing plan: _____ ESN/CDP/hybrid/none

Maximum number of digits in local mailbox: _____

* ESN access codes : _____

* Number of digits in common between ESN prefix and local ext.: _____

** Number of digits in common between CDP Steering Code and local ext.: _____

*** ESN prefix and/or CDP steering codes (max. length 8 for CDP/hybrid, 1 for ESN):

1. _____ 2. _____ 3. _____ 4. _____

5. _____ 6. _____ 7. _____ 8. _____

Mailbox numbering follows Dialing Plan? Yes _____ No _____

- If Yes, Mailbox = DN? Yes _____ No _____ If Yes, no mailbox prefix
 If No, enter mailbox prefix: _____

- If Yes, Mailbox = DN? Yes _____ No _____ If Yes, enter dial prefix _____
 If No, enter mailbox prefix: _____

Remote sites (Fill out this part of the form for each remote site)

Site number	Site name	Network connection DNs	Passwords (Initiate, Respond)
_____	_____	_____	Init _____ Resp _____

* Fill this in if the dialing plan is ESN or hybrid (CDP/ESN).

** Fill this in if the dialing plan is CDP or hybrid.

*** Fill this in if the dialing plan is ESN or CDP or hybrid.

Networking data form (part 2)**MM-14**

Customer: _____ Rep: _____

Customer rep: _____ Location: _____

Date: _____ Job #: _____ Meridian Mail release: _____

This form contains site-specific data for Networking configuration. For more information, see the Meridian Networking administration chapter in the *Networking Services Administration Guide* (NTP 555-7001-335).

To set the message delivery thresholds for the remote site, fill in the network scheduling parameters listed below. Create a separate form for each remote site.

Networking scheduling parameters

Site number:	_____	Range 1-500
Site name:	_____	Max. 32 characters
Economy class initiation time:	_____	default 18:00
Economy class stale time:	_____	default 6 hours
Standard class holding time:	_____	default 3 hours
Standard class stale time:	_____	default 9 hours
Urgent class holding time:	_____	default 30 minutes
Urgent class stale time:	_____	default 1.5 hours
Batch threshold:	_____	default is 20
Wakeup interval (minutes):	_____	default is 5
Networking call maximum:	_____	default is 4

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Reader Response Form

**Meridian Mail Modular Option GP
Site and Installation Planning Guide
555-7051-200**

Tell us about yourself:

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Company: _____

Address: _____

Occupation: _____ **Phone:** _____

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- New User Intermediate Experienced Programmer

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?

*Please return your comments by fax to (416) 597-7104, or mail your comments to:
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How the world shares ideas.

Reader Response Form

Meridian Mail Modular Option GP

Site and Installation Planning Guide

Toronto Information Products
Nortel Networks
522 University Avenue, 14th Floor
Toronto, Ontario Canada
M5G 1W7

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