# Meridian Mail Modular Option EC

Site and Installation Planning

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# Publication history

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# Contents

## Figures



## Tables

## Procedures

# About this document

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. Forms and checklists are provided to aid you in planning Meridian Mail installation and configuration.

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 book

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

## How this book is organized

This book is organized into five chapters and four 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, “Maximum networking combinations,” discusses the maximum number of sites, locations, dialing translation tables, and exchange codes allowed.
- Chapter 3, “Selecting a site,” examines the factors involved in selecting a site.
- Chapter 4, “Preparing for installation,” identifies the items required before you can install Meridian Mail.
- Chapter 5, “Planning spares requirements,” lists the number and type of Meridian Mail component spares needed for your installation.

- Chapter 6, “Reference documents,” lists documents that may be of value during the site planning and preparation process.
- Appendix A, “Component list,” identifies all the components that can be ordered individually.
- Appendix B, “Cable and wiring plan,” contains a form for use in planning the cabling and wiring of the system.
- Appendix C, “Site survey checklist,” is a checklist of items to prepare before installing the system.
- Appendix D, “Data forms and site log form,” contains data entry forms that help plan and configure Meridian Mail, as well as a site log form.

## NTP references

For references to the *System Administration Guide* or the *Installation Guide*, refer to the following lists to find the version of the NTP (as identified by the NTP number) that applies to your system:

- *System Administration Guide* (NTP 555-7001-301) for a single customer system
- *System Administration Guide for Multi-Customer System*s (NTP 555-7001-302)
- *Customer Administration Guide for Multi-Customer Systems* (NTP 555-7001-303)
- *Meridian Mail Modular Option EC Installation and Maintenance Guide* (NTP 555-7061-250)

# Chapter 1: Determining system size

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.

For hospitality systems, the estimates for system size requirements are different than for other Meridian Mail systems. As a result, the method for determining the system size for hospitality systems is discussed separately in the section titled “Determining system size for hospitality systems” on page 1-41. If you are purchasing a hospitality system, go to that section now.

## Basic-service, full-service, and multimedia ports

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, Northern Telecom (Nortel) 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 x 2) + full- and basic-service = total ports*

  **Example**

  If five multimedia ports and six full-service voice ports are required, purchase

  *(5 x 2) + 6 = 16 full-service ports*

  ***Note:*** The total should be evenly divided by 4 since ports are provided on voice processor cards in multiples of 4. If it cannot be divided evenly by 4, 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 | ACCESS 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 | HM | Hospitality Messaging |
| TS | Thru-Dial Service | CO | Post Checkout Mailbox |
| VS | Voice Softkey | VF | Voice Forms Service |
| | | TR | Transcription Service |
| | | NW | Meridian Networking |
| | | *FOC | Fax Outcalling |
| | | Plus all basic services | |

***Note 1:*** FOC (Fax Outcalling 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 the “Number of multimedia ports required” section for more details.

If you are going to have a mixture of port types and/or capabilities, you will need to 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, ACCESS or IVR). Then refer to the section “Determining the number of voice ports required” 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 the section “Determining the number of voice ports required” 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 voice 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 the section “Determining the number of multimedia ports required” for instruction on estimating traffic requirements for fax-related features. Follow only those procedures that refer to applications or features that 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 the section “Determining the total number of voice and multimedia ports required” to determine the system size required.

## ACD queue requirements

If you are going to have a mixture of port types and/or capabilities, you will need to set up a separate ACD queue for each group of ports. After you determine the number of ports required of each type and capability, use the Meridian Mail TNs data form in Appendix D to 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.

$$CCS = \frac{total\ call\ seconds}{100\ seconds}$$

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. Keep in mind that 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 (Figure 1-1) helps you perform the required calculations. The steps are

- Determine the busy hour voice messaging activity (connect time). For instructions, see Procedure 1-1.
- Determine the busy hour activity of all Meridian Mail applications used by your organization. For instructions, see Procedure 1-2.

- Determine the increase in activity that Networking will cause if that feature has been purchased. For instructions, see Procedure 1-3.

  If Networking has not been purchased, then skip this step.

- Estimate the increase in activity that Outcalling will cause if that feature has been purchased. For more information, see Table 1-3.

  If Outcalling has not been purchased, then skip this step.

- Calculate the number of ports required. For instructions, see Procedure 1-4.

**Figure 1-1**
**Worksheet for calculating busy hour activity and the number of 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 Procedure 1-1) | | 1 |
| **2** | Activity of all applications (see Procedure 1-2) | | |
| | Voice Menu activity | 2a | 2b |
| | ***Note:*** Voice menus with fax items for callback delivery must be on full-service voice ports. Refer to the heading "Fax call-back activity." Other voice menus only require basic-service ports. | | |
| | Announcements activity | 2c | |
| | Voice Forms activity | | 2d |
| | ACCESS applications activity | 2e | 2f |
| | Auto Attendant activity (if used during busy hour) | 2g | |
| **3** | Networking activity (if installed and not dedicated) (see Procedure 1-3) | | 3 |
| **4** | Outcalling activity (if installed and not dedicated) (see Table 1-3) | | 4 |
| **5** | Add each column | 5a | 5b |

**—continued—**

**Figure 1-1 (continued)**
**Worksheet for calculating busy hour activity and the number of ports required**

**6** Number of voice ports required (see Procedure 1-4)

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 Table 1-4 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 Table 1-4 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 ports dedicated to or required for other specialized services (see step 7 in Procedure 1-4) — 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 Table 1-14 in the “Determining the number of nodes” section. 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 Procedure 1-1, then record the result in box 1 of Figure 1-1. See Table 1-1 for an example.

**Procedure 1-1**
**Calculating the busy hour messaging activity**

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 Figure 1-1.

**Table 1-1**
**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 ACCESS 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, add the applications' estimated activity to the requirements for Voice Messaging (see Procedure 1-4).

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 Procedure 1-2. See Table 1-2 for an example.

**Procedure 1-2**
**Calculating the total busy hour activity**

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

**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 on a piece of note paper.

**5** Repeat steps 1 through 4 for each application item (that is, voice menu, announcement, or voice form).

**6** Add all the items together and record the result in the appropriate step 2 box of Figure 1-1.

**7** Repeat steps 1 through 6 for each application.

**Table 1-2**
**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 of Figure 1-1)** | | | **3600** |
| Announcement 1 | 40 | 5 | 200 |
| Announcement 2 | 30 | 10 | 300 |
| **Subtotal (recorded in box 2c of Figure 1-1)** | | | **500** |
| Voice Form 1 | 200 | 10 | 2000 |
| Voice Form 2 | 220 | 10 | 2200 |
| **Subtotal (recorded in box 2d of Figure 1-1)** | | | **4200** |
| Auto Attendant (if used during busy hour) (recorded in box 2g of Figure 1-1) | 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 Procedure 1-3. A typical assumption is that networking traffic will increase overall voice messaging traffic by 5%.

**Procedure 1-3**
**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 Figure 1-1.

**1** Multiply the result in box 1 of Figure 1-1 by .05.

**2** Record the result in box 3 of Figure 1-1.

## 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 Table 1-3.

**Table 1-3**
**Determining how your organization will use Outcalling**

| If | then |
|---|---|
| only a small number of users will be using Delivery to Non-Users and/or 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 is going to be restricted to low-traffic periods (for example, after-hours) | the feature should have no impact on your system requirements. |
| a large number 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 of Figure 1-1. |
| 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.<br>The result is recorded in box 13 of Figure 1-1. |

## Number of ports required

**Procedure 1-4**
**Calculating the number of voice ports required**

1. Copy the figure from box 5a on the first page of Figure 1-1 into box 6 on the second page of Figure 1-1.
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 Figure 1-1 into box 9 on the second page of Figure 1-1.
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 Table 1-4. In the column labelled “Capacity of system,” find the range within which the calculated total busy hour CCS falls. The corresponding value in the column labelled “Number of ports” is the number of ports required to accommodate the estimated total system activity.
6. Record the values from Table 1-4 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 Figure 1-1.
8. Add boxes 8 and 11 through 14 together. Record the result in box 15.

**Table 1-4**
**Port capacity**
**(based on 40-second sessions and 5% of busy-hour calls being queued for over one ring)**

| Number of ports | Capacity of system (in CCS) |
|---|---|
| 2 | 0 to 14 |
| 4 | 15 to 54 |
| 6 | 55 to 103 |
| 8 | 104 to 157 |
| 12 | 158 to 273 |
| 16 | 274 to 396 |
| 20 | 397 to 522 |
| 24 | 523 to 651 |
| 28 | 652 to 782 |
| 32 | 783 to 915 |
| 36 | 916 to 1049 |
| 40 | 1050 to 1183 |
| 44 | 1184 to 1318 |
| 48 | 1319 to 1455 |
| 52 | 1456 to 1591 |
| 56 | 1592 to 1729 |
| 60 | 1730 to 1866 |
| 64 | 1867 to 2004 |
| 68 | 2005 to 2143 |
| 72 | 2144 to 2282 |
| 76 | 2283 to 2421 |
| 80 | 2422 to 2561 |
| 84 | 2562 to 2700 |
| 88 | 2701 to 2839 |
| 92 | 2840 to 2980 |
| 96 | 2981 to 3120 |

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 Table 1-4, you can see that to accommodate that level of traffic, you would need a 20-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

If you are purchasing the Fax Outcalling/Fax-on-Demand (voice menu with fax items, fax callback delivery, fax announcements) feature, 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 the "Voice menus with fax items (same call delivery)" subsection later in this section. To calculate the traffic requirements for a fax announcement service with same call delivery, refer to the "Fax announcements (stand-alone fax service)" subsection later in this section.

### 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" |
| • requirements for the fax delivery | subsection called "Fax callback activity" (later in this section) |
| • traffic requirements for a fax announcement service with callback delivery | subsection called "Fax announcements (stand-alone fax service)" (later in this section) |

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" in the "Calculating the number of multimedia ports required" section for more details.

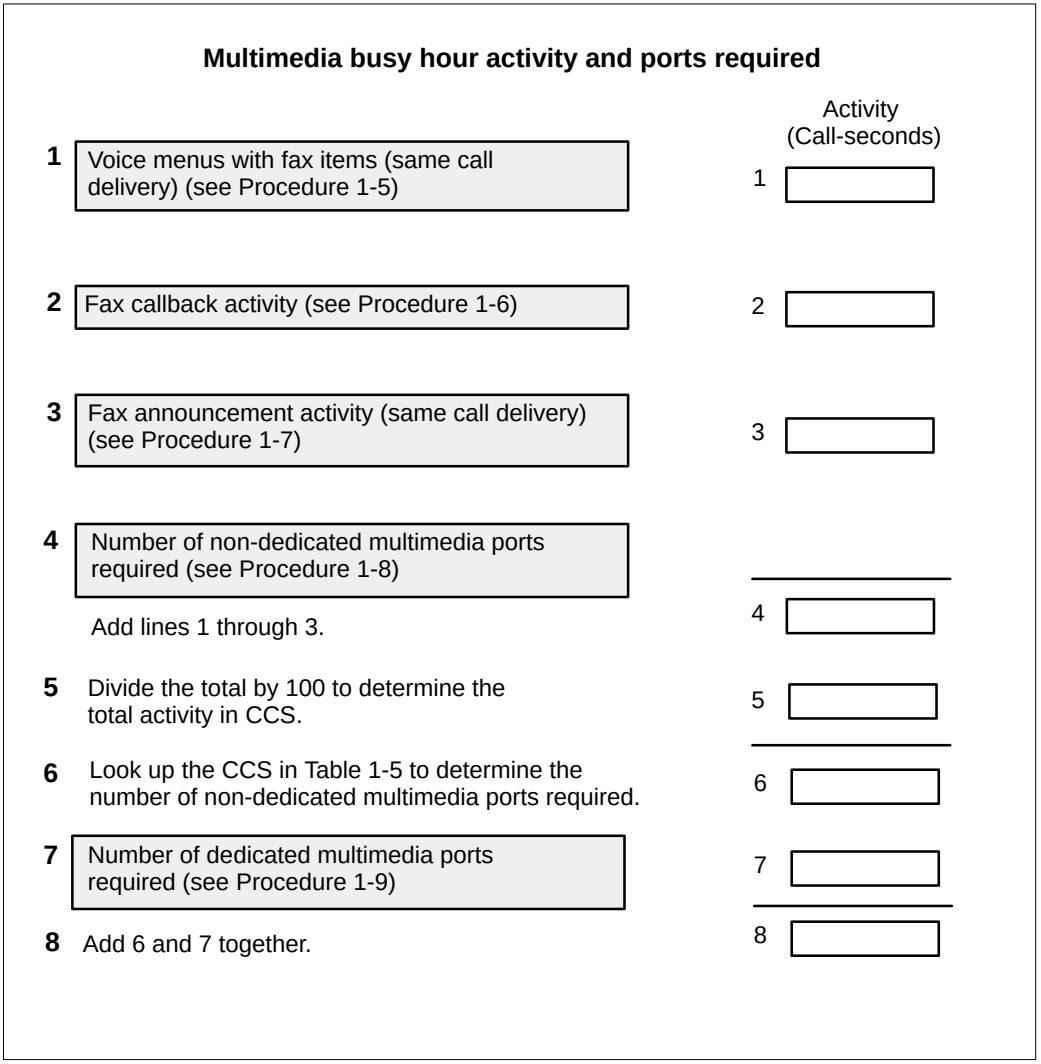
Keep in mind that the traffic requirements you need to estimate are those requirements you anticipate during the busy hour. If you set up your system so that callback deliveries are made outside of the busy hour, then the callback traffic will not impact your busy hour calculations.

***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 10 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 10 same call deliveries and 15 callback deliveries.

***Note 2:*** Figure 1-2 is a worksheet that helps you with your estimates and calculations for each step.

**Figure 1-2**
**Worksheet for calculating the number of multimedia ports required**



## 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).

To estimate the call connect time (traffic) for multimedia voice menus during the busy hour, use Procedure 1-5.

**Procedure 1-5**
**Estimating the call connect time for multimedia voice menus**

**1** Select a multimedia voice menu and estimate the average duration of calls during the busy hour.

When estimating this duration, include the following:

- 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
  - — 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 on a piece of note paper.

**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 Figure 1-2.

## 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.

To estimate the total busy-hour connect time for the fax callback deliveries, use Procedure 1-6.

> ***Note:*** If you want to dedicate ports to fax callback deliveries, see page 1-22.

**Procedure 1-6**
**Estimating the total busy-hour connect time for fax callback deliveries**

1. Estimate the average duration of fax callback delivery calls during the busy hour. When estimating this duration, include the following:
   - 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 Figure 1-2.

## 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 these types of announcements, refer to the section “Determining the number of voice ports required.” To estimate the traffic generated by the actual fax delivery, use Procedure 1-6.

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. Use Procedure 1-7.

**Procedure 1-7**
**Estimating the connect time for fax announcements with “same call” fax delivery**

1. Select a fax announcement and estimate the average duration of calls to this fax announcement during the busy hour.

   When estimating this duration, include the following:

   - 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 Figure 1-2.

## Calculating the number of multimedia ports required

### Non-dedicated multimedia ports

To calculate the number of non-dedicated multimedia ports required, use Procedure 1-8.

**Procedure 1-8**
**Calculating the number of non-dedicated multimedia ports required**

1. Add the totals from Procedures 1-5 through 1-7 and record the result in box 4 of Figure 1-2.
2. Divide the result in box 4 by 100 to get the estimated busy hour multimedia activity in centi (hundred) call seconds (CCS), and 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 Table 1-5. 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, you should calculate the non-dedicated port requirements for other Fax-on-Demand services separately (see Procedure 1-8). 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.

To calculate the number of dedicated multimedia ports required for fax callback deliveries, use Procedure 1-9.

**Procedure 1-9**
**Calculating the number of dedicated multimedia ports required for fax callback deliveries**

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

Ports required = (Total fax callback delivery call seconds in busy hour) / (Maximum wait time for delivery in seconds)

**2** Record the result in box 7 of Figure 1-2.

**Table 1-5**
**Port capacity**
**(based on 234-second sessions and 5% of busy-hour calls being queued for over one ring)**

| Number of ports | Capacity of system (in CCS) |
|---|---|
| 2 | 0 to 12 |
| 3 | 13 to 29 |
| 4 | 30 to 48 |
| 5 | 49 to 70 |
| 6 | 71 to 93 |
| 7 | 94 to 117 |
| 8 | 118 to 142 |
| 10 | 143 to 194 |
| 12 | 195 to 248 |
| 14 | 249 to 303 |
| 16 | 304 to 360 |
| 18 | 361 to 418 |
| 20 | 419 to 477 |
| 22 | 478 to 536 |
| 24 | 537 to 596 |
| 26 | 597 to 657 |
| 28 | 658 to 718 |
| 30 | 719 to 779 |
| 32 | 780 to 841 |
| 34 | 841 to 904 |
| 36 | 905 to 966 |
| **—continued—** | |

**Table 1-5 (continued)**
**Port capacity**
**(based on 234-second sessions and 5% of busy-hour calls being queued for over one ring)**

| Number of ports | Capacity of system (in CCS) |
|---|---|
| 38 | 967 to 1029 |
| 40 | 1030 to 1092 |
| 42 | 1093 to 1156 |
| 44 | 1157 to 1219 |
| 46 | 1220 to 1283 |
| 48 | 1284 to 1347 |
| **—end—** | |

In Table 1-5, you can see that a traffic capacity (total activity) of 145 CCS would require 10 ports.

# 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 5 multimedia ports and 6 voice ports as per your calculations to this point, you would actually need a system with 16 physical port locations (10 ports to configure 5 multimedia ports, and 6 ports to configure 6 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)

Follow Procedure 1-10 to calculate the total number of ports required to support voice and multimedia services. Use Figure 1-3 as your worksheet.

**Figure 1-3**
**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 Figure 1-1 — 1 ☐

**2** Number of ports required for multimedia services (including dedicated ports) from box 8 of Figure 1-2 — 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" section.

**Procedure 1-10**
**Calculating the total number of voice and multimedia ports**

1. Copy the figure from box 15 (total voice ports) of Figure 1-1 into box 1 of Figure 1-3.
2. Copy the figure from box 8 (total multimedia ports) of Figure 1-2 into box 2 of Figure 1-3.
3. Multiply box 2 by "2" and record the result in box 3.
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 4. (Ports are provided on voice processor cards in multiples of 4.) Record the new total in box 5.
6. Look up the total in the section "Determining the number of nodes" (on page 1-34) to decide the number of nodes your system will require.

# Determining storage hours required

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 upcoming sections ("Message storage requirements," "Voice services storage requirements," and "Personal verifications storage requirements"). These sections are followed by "Determining system size required based on traffic (nodes and ports) and storage hour requirements," which explains how to calculate the total storage hours required and the overall system size your site requires.

# Message storage requirements

Message storage includes received messages or unsent composed messages stored in your mailbox, personal verifications, 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 which 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 yet) and the average length of each message, plus the length of the personal verifications. This varies depending on the organization and applications. The minimum storage time which should be allowed per user is one minute. Average message length is about 30 seconds. If each user is allocated ten minutes of storage time, then approximately twenty messages (including personal verifications) can be stored per user.

> ***Note:*** The storage requirements for personal verifications are calculated separately. Refer to Table 1-13.

When determining storage requirements for messages, consider the average storage time required per user, since the average 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
- 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

**Procedure 1-11**
**Calculating the storage time required for messages and personal verifications**

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% 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% safety margin added on, total storage time is 6000 minutes or 100 hours as shown in Table 1-6.

**Table 1-6**
**Message storage time calculation example**

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

## Storage time required for responses to voice forms

Voice forms allow subscribers using a touch tone phone to call the system and provide verbal information to prerecorded prompts.

A typical voice form contains ten prompts, and responses to the prompts are typically 10 seconds long for each prompt. 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.

**Procedure 1-12**
**Calculating the storage time required for voice forms responses**

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.

**Table 1-7**
**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

**Procedure 1-13**
**Calculating the total message storage requirements**

1. Add the storage times determined in Procedures 1-11 and 1-12.
2. If you have not already done so, convert the storage times to hours.

**Table 1-8**
**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

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

The voice services storage time depends on the following things:

- 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 items listed above, is divided into four procedures which 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.

**Procedure 1-14**
**Estimating the storage time required for voice menus and announcements**

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

**Table 1-9**
**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 Procedure 1-15.

**Procedure 1-15**
**Estimating the storage time required for voice forms definitions**

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.

**Table 1-10**
**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 Procedure 1-16.

**Procedure 1-16**
**Estimating the fax storage requirements**

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.

**Table 1-11**
**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 |

## Calculate the total hours of storage required for voice services

**Procedure 1-17**
**Estimating the total storage requirements**

Add the storage times determined in Procedures 1-14 through 1-16. See Table 1-12 for an example.

**Table 1-12**
**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 seven seconds per personal verification. Therefore, if you have 1000 subscribers, required storage time is 1000 x 7 = 7000 seconds or approximately 2.0 hours.

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

**Table 1-13**
**Personal verifications storage time calculation example**

| Number of users x | Estimated average personal verification length (seconds) = | Required storage time |
|---|---|---|
| 1000 | 7 | 7000 seconds/3600 = 2.0hours |

# Determining the number of nodes

Table 1-14 shows the number of ports and the range of storage hours available with different numbers of nodes (with only one language installed).

**Table 1-14**
**Node configurations**

| Ports | Nodes | Storage hours (disk size) | Storage hours (disk size) with disk-to-disk backup |
|---|---|---|---|
| 4–24 | 1 | 5 | n/a |
| | | 11 | n/a |
| | | 24 | n/a |
| | | 36 | n/a |
| | | 54 | n/a |
| | | 100 | n/a |
| 28–48 | 2 | 26 | 19 |
| | | 54 | 48 |
| | | 84 | 78 |
| | | 114 | 108 |
| | | 200 | 193 |
| 28–32 | 3 | 30 | n/a |
| | | 60 | 37 |
| | | 90 | 67 |
| | | 120 | 97 |
| | | 200 | 177 |
| 52–72 | 4 | 45 | n/a |
| | | 90 | 66 |
| | | 120 | 96 |
| | | 180 | 156 |
| | | 300 | 276 |
| 76–96 | 5 | 60 | n/a |
| | | 120 | 94 |
| | | 180 | 154 |
| | | 240 | 214 |
| | | 400 | 374 |

# 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 personal verifications and voice forms responses)
- the number of storage hours required for personal verifications

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

Use Table 1-17 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 Table 1-17 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 Table 1-17 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.

## 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 Table 1-17. 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 Table 1-15. 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.

**Table 1-15**
**Additional language storage requirements for VS1 and VS2**

| Number of nodes | Number of languages | | | |
|---|---|---|---|---|
| | 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 Table 1-17, you will have to 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

On multi-node systems, this allows 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 Table 1-17.

## Selecting the required system size

The steps required for selecting the system size based on traffic and storage requirements are listed in Procedure 1-18. You will need to refer to Table 1-17 when following these steps.

**Procedure 1-18**
**Determining the system size**

1 Consider the number of nodes required based on the traffic calculations earlier in this chapter.

For example, if your system requires two nodes to handle the traffic requirements, then that is the smallest system you can have regardless of storage requirements.

2 Refer to Table 1-17 and 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 Table 1-16 to confirm your decision.

**Table 1-16**
**Validating your system selection decision**

***Note:*** Use Table 1-17 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.<br>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.<br>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 would 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 would also have to 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, voice services plus personal verifications would not both be able to fit on VS1. In this case, 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 is 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).

**Table 1-17**
**Message storage and Voice Services storage hours available per system size**

| Number of-nodes | Total storage hours (without disk-to-disk backup) | Total storage hours (with disk-to-disk backup) | Maximum hours available for Voice Services and messages (per disk volume) 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 | | |
| 1.2 Gbyte disk | 100 | n/a | 5.4 | 100 | | |
| 2 | 26 | 19 | 2.0 | 9 | 16.8 | 10.4 |
| | 54 | 48 | 3.5 | 23 | 32.0 | 25.6 |
| | 84 | 78 | 3.5 | 23 | 61.9 | 55.5 |
| | 114 | 108 | 3.5 | 54 | 61.9 | 55.5 |
| 1.2 Gbyte disk | 200 | 193 | 5.5 | 100 | 100.0 | 93.6 |
| 3 | 30 | n/a | 18.3 | | 16.8 | n/a |
| | 60 | 37 | 18.3 | | 32.0 | 25.6 |
| | 90 | 67 | 18.3 | | 61.9 | 55.5 |
| | 120 | 97 | 18.3 | | 61.9 | 55.5 |
| 1.2 Gbyte disk | 200 | 177 | 18.3 | | 100.0 | 93.6 |
| 4 | 45 | n/a | 18.3 | | 16.8 | n/a |
| | 90 | 66 | 18.3 | | 32.0 | 25.6 |
| | 120 | 96 | 18.3 | | 61.9 | 55.5 |
| | 180 | 156 | 18.3 | | 61.9 | 55.5 |
| 1.2 Gbyte disk | 300 | 276 | 18.3 | | 100.0 | 93.6 |
| 5 | 60 | n/a | 19.5 | | 16.8 | n/a |
| | 120 | 94 | 19.5 | | 32.0 | 25.6 |
| | 180 | 154 | 19.5 | | 61.9 | 55.5 |
| | 240 | 214 | 19.5 | | 61.9 | 55.5 |
| 1.2 Gbyte disk | 400 | 374 | 19.5 | | 100.0 | 93.6 |

***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.

# Determining system size for hospitality systems

Hospitality systems are not used as heavily as other Meridian Mail systems. As a result, many of the estimates and guidelines presented earlier in this chapter for estimating system usage and system requirements are not realistic for hospitality systems. To determine the required system size for hospitality systems, refer to Table 1-18 in this section which provides estimates based on normal conditions for hotel environments.

**Table 1-18**
**Determining system size for hospitality systems**

| Number of rooms (R) | Staff users (S) | Total CCS (T) | Hours Req'd (H) | Minimum system | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Message storage hours | | | |
| | | | | Nodes | Ports | 1 Lang | 2 Lang | 3 Lang | 4 Lang |
| 1 to 227 | 32 | 38.6 | 5.0 | 1 | 4 | 5 | 11 | 11 | 24 |
| 228 to 319 | 45 | 54.2 | 7.0 | 1 | 4 | 11 | 11 | 24 | 24 |
| 320 to 500 | 71 | 85.0 | 11.0 | 1 | 8 | 11 | 24 | 24 | 24 |
| 501 to 927 | 132 | 157.6 | 20.4 | 1 | 8 | 24 | 24 | 36 | 36 |
| 928 to 1225 | 175 | 208.3 | 27.0 | 1 | 12 | 36 | 36 | 36 | 36 |
| 1226 to 2330 | 332 | 396.1 | 51.3 | 2 | 16 | 54 | 84 | 84 | 84 |
| 2331 to 3073 | 439 | 522.4 | 67.6 | 2 | 20 | 84 | 84 | 84 | 84 |
| 3074 to 3832 | 547 | 651.4 | 84.3 | 2 | 24 | 114 | 114 | 114 | 114 |
| 3833 to 4603 | 657 | 782.5 | 101.3 | 3 | 28 | 120 | 120 | 120 | 120 |
| 4604 to 5382 | 768 | 914.9 | 118.4 | 3 | 32 | 120 | 120 | 120 | 120 |
| 5383 to 6169 | 881 | 1048.7 | 135.7 | 4 | 36 | 180 | 180 | 180 | 180 |
| 6170 to 6961 | 994 | 1183.4 | 153.1 | 4 | 40 | 180 | 180 | 180 | 180 |
| 6962 to 7758 | 1108 | 1318.9 | 170.7 | 4 | 44 | 180 | 180 | 180 | 180 |

For Table 1-18, make the following assumptions:

- There is one staff mailbox for every seven rooms (S = R/7).
- A staff mailbox uses 80 seconds of storage and 0.27 CCS in busy hour.
- A guest mailbox uses 50 seconds of storage and 0.1 CCS in busy hour in a full hotel.
- Allow a 30% safety margin in required storage hours.

- Other features (for example, auto-attendant, menus, forms, Outcalling, Networking) use at most another 20% of busy hour port time.
- Message Waiting Indication (MWI) is not on for the introductory greeting. If the system is to be set up such that the MWI is turned on for the introductory greeting, then increase traffic (that is CCS) by another 20%. This may increase port requirements but will not affect storage requirements.
- Busy hour traffic is calculated as follows:
  $T = 1.2 \times (0.27S + 0.1R) = 0.17R$
- Hours of message storage required is calculated as follows:
  $H = 1.3 \times (80S + 50R)/3600 = 0.022R$

# Meridian ACCESS links

Multiple ACCESS links 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 Table 1-19.

**Table 1-19**
**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 ACCESS link can be configured for use by AdminPlus.

Table 1-21 shows which data ports can be used for ACCESS links and the maximum baud rate (in Kbps) that can be used on those ports. Table 1-20 lists both the minimum and maximum baud rates.

**Table 1-20**
**Baud rate limitations for data links**

| For | Minimum baud rate (per port) | Maximum baud rate (per port) | Maximum combined baud rate (per node) |
|---|---|---|---|
| RSM/Utility card | 2 400 bps | 9 600 bps | 19 200 bps |
| CPU card | 2 400 bps | 38 400 bps | 38 400 bps |
| ACCESS link | 4 800 bps | 38 400 bps | not applicable |
| AdminPlus link | 2 400 bps | 9 600 bps | not applicable |

**Table 1-21**
**Dataports that can be used for ACCESS links (recommended setup for nodes 1 and 2)**

***Note:*** Baud rates are shown in Kbps. For nodes 3, 4, and 5, see Table 1-22.

| System limits | | | | Node 1 | | | | | | Node 2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| # of Nodes | Data links | Max. voice ports | Cum. baud rate | 6804#1 | 6804#2 | UTL#1 | UTL#2 | UTL#3 | UTL#4 | 6804#1 | 6804#2 |
| 1 | 0 | 24 | | | | | | | | | |
| | 1 | 24 | 9.6 | | | 9.6 | | | | | |
| | 2 | 24 | 19.2 | | | 9.6 | 9.6 | | | | |
| | 3 | 24 | 19.2 | | | 9.6 | 4.8 | 4.8 | | | |
| | 4 | 24 | 19.2 | | | 4.8 | 4.8 | 4.8 | 4.8 | | |
| 2 | 0 | 48 | | | | | | | | | |
| | 1 | 48 | 38.4 | | | | | | | 38.4 | |
| | 2 | 48 | 38.4 | | | | | | | 19.2 | 19.2 |
| | 3 | 48 | 48.0 | | | 9.6 | | | | 19.2 | 19.2 |
| | 4 | 48 | 57.6 | | | 9.6 | 9.6 | | | 19.2 | 19.2 |
| | 5 | 48 | 57.6 | | | 9.6 | 4.8 | 4.8 | | 19.2 | 19.2 |
| | 6 | 48 | 57.6 | | | 4.8 | 4.8 | 4.8 | 4.8 | 19.2 | 19.2 |
| 3 | 0 | 48 | | | | | | | | | |
| | 1 | 48 | 38.4 | | | | | | | 38.4 | |
| | 2 | 48 | 76.8 | | | | | | | 38.4 | |
| | 3 | 48 | 76.8 | | | | | | | 19.2 | 19.2 |
| | 4 | 48 | 76.8 | | | | | | | 19.2 | 19.2 |
| | 5 | 48 | 86.4 | | | 9.6 | | | | 19.2 | 19.2 |
| | 6 | 48 | 96.0 | | | 9.6 | 9.6 | | | 19.2 | 19.2 |
| | 7 | 48 | 96.0 | | | 9.6 | 4.8 | 4.8 | | 19.2 | 19.2 |
| | 8 | 48 | 96.0 | | | 4.8 | 4.8 | 4.8 | 4.8 | 19.2 | 19.2 |

**—continued—**

**Table 1-21 (continued)**
**Dataports that can be used for ACCESS links (recommended setup for nodes 1 and 2)**

| System limits | | | | Node 1 | | | | | | Node 2 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| # of Nodes | Data links | Max. voice ports | Cum. baud rate | 6804 0#1 | 6804 0#2 | UTL#1 | UTL#2 | UTL#3 | UTL#4 | 6804 0#1 | 6804 0#2 |
| 4 | 0 | 72 | | | | | | | | | |
| | 1 | 72 | 38.4 | | | | | | | 38.4 | |
| | 2 | 72 | 76.8 | | | | | | | 38.4 | |
| | 3 | 72 | 115.2 | | | | | | | 38.4 | |
| | 4 | 72 | 115.2 | | | | | | | 19.2 | 19.2 |
| | 5 | 72 | 115.2 | | | | | | | 19.2 | 19.2 |
| | 6 | 72 | 115.2 | | | | | | | 19.2 | 19.2 |
| | 7 | 72 | 124.8 | | | 9.6 | | | | 19.2 | 19.2 |
| | 8 | 72 | 134.4 | | | 9.6 | 9.6 | | | 19.2 | 19.2 |
| 5 | 0 | 96 | | | | | | | | | |
| | 1 | 96 | 38.4 | | | | | | | 38.4 | |
| | 2 | 96 | 76.8 | | | | | | | 38.4 | |
| | 3 | 96 | 115.2 | | | | | | | 38.4 | |
| | 4 | 96 | 153.6 | | | | | | | 38.4 | |
| | 5 | 96 | 153.6 | | | | | | | 19.2 | 19.2 |
| | 6 | 96 | 153.6 | | | | | | | 19.2 | 19.2 |
| | 7 | 96 | 153.6 | | | | | | | 19.2 | 19.2 |
| | 8 | 96 | 153.6 | | | | | | | 19.2 | 19.2 |
| **—end—** | | | | | | | | | | | |

**Table 1-22**
**Dataports that can be used for ACCESS links (recommended setup for nodes 3, 4, and 5)**

***Note:*** Baud rates are shown in Kbps. For nodes 1 and 2, see Table 1-21.

| System limits | | | | Node 3 | | Node 4 | | Node 5 | |
|---|---|---|---|---|---|---|---|---|---|
| # of Nodes | Data links | Max. voice ports | Cum. baud rate | 6804 0#1 | 6804 0#2 | 6804 0#1 | 6804 0#2 | 6804 0#1 | 6804 0#2 |
| 1 | 0 | 24 | | | | | | | |
| | 1 | 24 | 9.6 | | | | | | |
| | 2 | 24 | 19.2 | | | | | | |
| | 3 | 24 | 19.2 | | | | | | |
| | 4 | 24 | 19.2 | | | | | | |
| 2 | 0 | 48 | | | | | | | |
| | 1 | 48 | 38.4 | | | | | | |
| | 2 | 48 | 38.4 | | | | | | |
| | 3 | 48 | 48.0 | | | | | | |
| | 4 | 48 | 57.6 | | | | | | |
| | 5 | 48 | 57.6 | | | | | | |
| | 6 | 48 | 57.6 | | | | | | |
| 3 | 0 | 48 | | | | | | | |
| | 1 | 48 | 38.4 | | | | | | |
| | 2 | 48 | 76.8 | 38.4 | | | | | |
| | 3 | 48 | 76.8 | 38.4 | | | | | |
| | 4 | 48 | 76.8 | 19.2 | 19.2 | | | | |
| | 5 | 48 | 86.4 | 19.2 | 19.2 | | | | |
| | 6 | 48 | 96.0 | 19.2 | 19.2 | | | | |
| | 7 | 48 | 96.0 | 19.2 | 19.2 | | | | |
| | 8 | 48 | 96.0 | 19.2 | 19.2 | | | | |

**—continued—**

**Table 1-22 (continued)**
**Dataports that can be used for ACCESS links (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 | 6804 0#1 | 6804 0#2 | 6804 0#1 | 6804 0#2 | 6804 0#1 | 6804 0#2 |
| 4 | 0 | 72 | | | | | | | |
| | 1 | 72 | 38.4 | | | | | | |
| | 2 | 72 | 76.8 | 38.4 | | | | | |
| | 3 | 72 | 115.2 | 38.4 | | 38.4 | | | |
| | 4 | 72 | 115.2 | 38.4 | | 38.4 | | | |
| | 5 | 72 | 115.2 | 19.2 | 19.2 | 38.4 | | | |
| | 6 | 72 | 115.2 | 19.2 | 19.2 | 19.2 | 19.2 | | |
| | 7 | 72 | 124.8 | 19.2 | 19.2 | 19.2 | 19.2 | | |
| | 8 | 72 | 134.4 | 19.2 | 19.2 | 19.2 | 19.2 | | |
| 5 | 0 | 96 | | | | | | | |
| | 1 | 96 | 38.4 | | | | | | |
| | 2 | 96 | 76.8 | 38.4 | | | | | |
| | 3 | 96 | 115.2 | 38.4 | | 38.4 | | | |
| | 4 | 96 | 153.6 | 38.4 | | 38.4 | | 38.4 | |
| | 5 | 96 | 153.6 | 38.4 | | 38.4 | | 38.4 | |
| | 6 | 96 | 153.6 | 19.2 | 19.2 | 38.4 | | 38.4 | |
| | 7 | 96 | 153.6 | 19.2 | 19.2 | 19.2 | 19.2 | 38.4 | |
| | 8 | 96 | 153.6 | 19.2 | 19.2 | 19.2 | 19.2 | 19.2 | 19.2 |

**—end—**

# Chapter 2: Maximum networking combinations

If you are planning to install Meridian Networking or Network Message Service (NMS), you should be aware of the number of sites and/or locations you can set up, and how that number affects the total number of dialing translation tables and exchange codes possible. For more details, refer to the *Networking Installation Guide* (NTP 555-7001-213), and the *Networking Services Administration Guide* (NTP 555-7001-335).

Table 2-1 shows the maximum combinations possible of sites, locations, dialing translation tables, and exchange codes. Note that not all combinations are covered, but tradeoffs are possible at approximate ratios of

1 site to 1 location to 3 translation tables to 10 exchange codes

The sites or locations defined in the Meridian Networking may be communicated with by either the AMIS protocol (that is, virtual node) or Meridian protocol (using modems).

Translation tables and Exchange codes are present if the local site requires any special dialing translations for the AMIS or Fax on Demand features. Please refer to the Dialing Translations administration NTP for further details.

***Note:*** The maximum number of steering codes (for ESN, CDP, or Hybrid dialing plans) is assumed in the tables (that is, up to 50 steering codes for each site or location).

The table limits are enforced during addition or modification of Networking or Dialing translation tables.

**Table 2-1**
**Maximum networking combinations**

| Sites | Locations | Translation tables | Exchange codes |
|---|---|---|---|
| **Dialing translations** | | | |
| 0 | 0 | 15 | 930 |
| 0 | 0 | 8 | 960 |
| **Networking/dialing translation** | | | |
| 2 | 0 | 15 | 830 |
| 5 | 0 | 15 | 770 |
| 10 | 0 | 15 | 670 |
| 20 | 0 | 15 | 470 |
| 30 | 0 | 5 | 340 |
| 40 | 0 | 5 | 140 |
| 48 | 0 | 0 | 0 |
| **NMS** | | | |
| 1 | 2 | 15 | 820 |
| 1 | 30 | 5 | 420 |
| 1 | 57 | 0 | 0 |
| **Networking/NMS** | | | |
| 2 | 56 | 0 | 0 |
| 5 | 53 | 0 | 0 |
| 10 | 47 | 0 | 0 |
| 20 | 35 | 0 | 0 |
| 30 | 22 | 0 | 0 |
| 40 | 10 | 0 | 0 |
| 47 | 2 | 0 | 0 |

**—continued—**

**Table 2-1 (continued)**
**Maximum networking combinations**

| Sites | Locations | Translation tables | Exchange codes |
|---|---|---|---|
| **Networking/NMS/Dialing translation** | | | |
| 2 | 2 | 15 | 800 |
| 2 | 36 | 5 | 300 |
| 3 | 2 | 15 | 780 |
| 3 | 35 | 5 | 300 |
| 5 | 2 | 15 | 740 |
| 5 | 32 | 5 | 300 |
| 10 | 2 | 15 | 640 |
| 10 | 26 | 5 | 300 |
| 20 | 2 | 5 | 520 |
| 20 | 14 | 5 | 300 |
| 30 | 2 | 5 | 310 |
| 40 | 2 | 5 | 110 |
| 43 | 2 | 5 | 50 |

***Sites*** are the Networking sites defined in the Network database. Sites are present if the Meridian Networking feature is used.

***Locations*** are the total number of Networking locations defined in the network database, both local and remote. Locations are present if the NMS feature is supported on the local site, or on any remote site in a network (that is, if the Meridian Networking feature is used).

***Translation tables*** are the number of Dialing Translation tables defined.

***Exchange codes*** are the total number of exchange (office) codes defined in the Dialing Translation tables.

**—end—**

# Chapter 3: Selecting a site

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 each other 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

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).

- *Installation and Acceptance (*NTP 553-2431-200)
- *Additional Shelf Installation/Removal* (NTP 553-2431-210)

The system is housed in stackable Universal Equipment Modules (UEMs), each containing up to three Meridian Mail nodes. A UEM 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.) |

The first UEM, when fully loaded, weighs approximately 60 kg (132 lb). Each additional UEM weighs either 50 kg (110 lb) or 55 kg (121 lb). For shadowed systems, the weights are about 5 kg (11 lb) higher.

The card set includes the MMP40 card, the utility card, and 4- or 8-port voice processor cards.

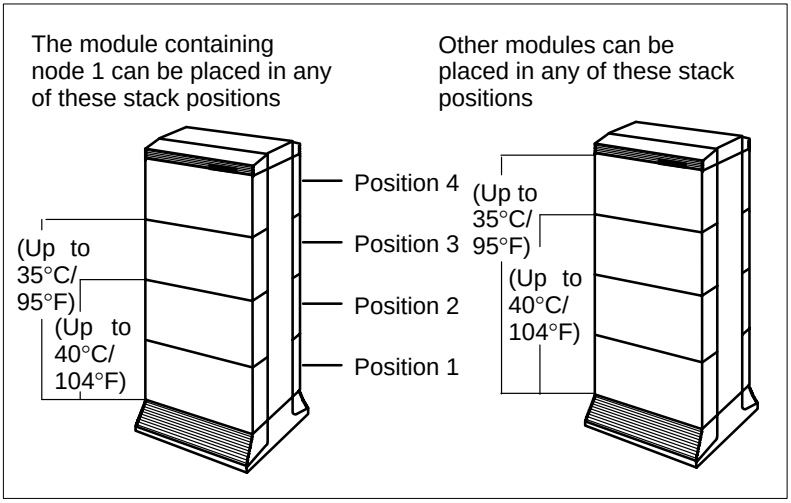
For easy maintenance, the floor space for the Meridian Mail Modular Option EC must include at least 90 cm (36 in.) of unobstructed space at the front, 90 cm (36 in.) at the rear, and 30 cm (12 in.) on each side of the equipment column.

## Module placement

Meridian Mail modules should be placed (as shown in Figure 3-1) 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).

**Figure 3-1**
**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 will 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)

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:

- administration/maintenance terminal and printer
- AC panel and outlets
- cable racks
- modem
- A/B switchbox
- switch
- Meridian Mail

# Power requirements

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

## Meridian Mail

Meridian Mail uses an NT8D40 power distribution unit. One power supply unit is located in modules with one node, and two power supply units are located in 2- or 3-node modules.

Table 3-1 indicates the required power supply for each system size.

**Table 3-1**
**EC 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 which enables you to download billing records from Meridian Mail. These records can be processed on the PC using any popular spreadsheet, reporting, or accounting program.

> ***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

- Table 3-2
- *Meridian Mail Reporter User Guide*

**Table 3-2**
**Meridian Mail Reporter terminal power supply requirements**

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

## LA75 printer

The power supply requirements for the LA75 printer are shown in Table 3-3.

**Table 3-3**
**LA75 printer power supply requirements**

| | |
|---|---|
| Power input | 100 or 120 V ac @ 1.6 A, 50/60 Hz |
| Power usage | 50 W |

## Modems

The power supply requirements for modems are shown in Table 3-4.

**Table 3-4**
**Modem power supply requirements**

| Modem type | Power input | Power usage |
|---|---|---|
| Ven-tel 2400 modem | 120 V ac, 60 Hz | 8 W nominal |
| Ven-tel 9600plus II | 120 V ac, 60 Hz | 8 W nominal |
| UDS EC 224A/D modem | 115V ac +/– 10, 50/60 Hz | 8 W nominal |

# Heat dissipation

The air conditioning in the equipment room must be capable of maintaining the operating temperature for the equipment (see Table 3-5) while handling heat produced by the following sources:

- 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

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:

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

### Power cable

The ac power cables are grounded 3-wire cables used for the module/cabinet, administration terminal, printer, and modem. They are 1.84 m (6 ft), 16-gauge, 3-conductor type SJT cables. The dc 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 to up to 1231 m (4000 ft) by use of limited distance modems.

### 2-pair twisted cable

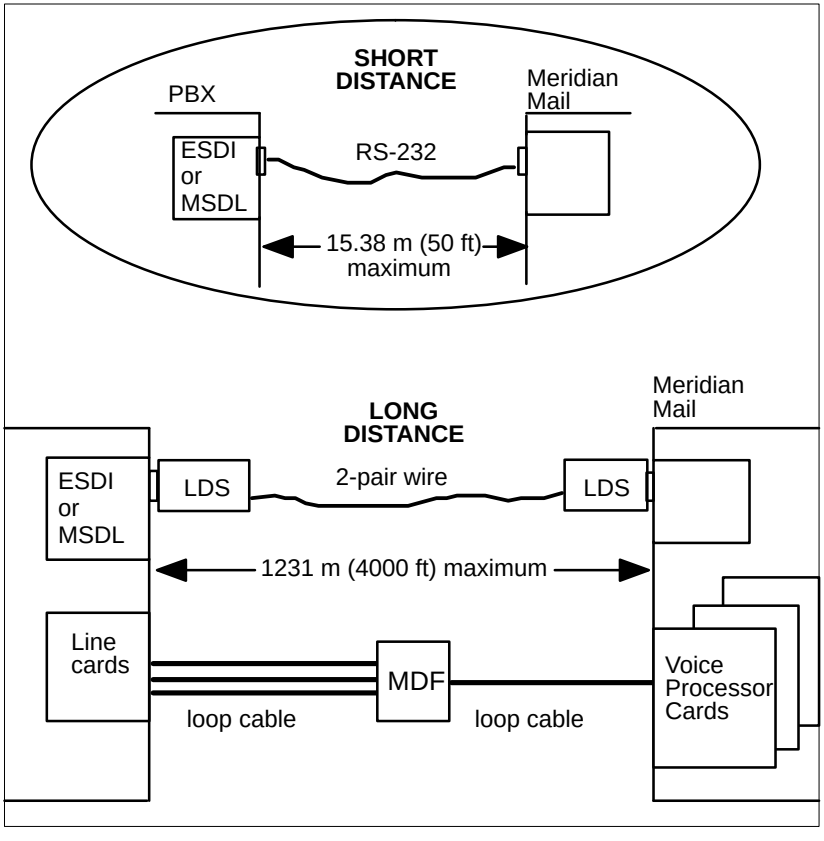
The 2-pair twisted cable connects the Local Data Sets in installations where Meridian Mail is between 15.38 and 1231 m (50 and 4000 ft) from the switch.

### Network loop cable

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

See Figure 3-2 for Meridian Mail short and long distance cable layouts. If you are using the AdminPlus program, some cabling changes are necessary. For details, see the *System Administration Guide - AdminPlus* (NTP 555-7001-310).

**Figure 3-2**
**Short and long distance cable layouts**




## Creating the cable plan

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

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). Vibration can cause slow deterioration of mechanical parts and, if severe, 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 10–40°C (50–104°F) and 10–80% RH non-condensing humidity (see Table 3-5). 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 -20–60°C (-4–140°F) and an RH non-condensing humidity range of 10–80%.

**Table 3-5**
**Equipment temperature/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 |

## Dust density

Recommended 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 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 $m^2$ (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, can result in temperatures exceeding those recommended for 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 $CO_2$ 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 4: Preparing for installation

## Meridian 1 equipment requirements

To connect Meridian Mail to Meridian 1 equipment, the Meridian 1 requires

- one ESDI port (QPC513H, or later version) or MSDL port (NT6D80A) for the Meridian (AML/CSL) link

  ***Note:*** QPC45 SDI cards are not compatible and should not be installed on the same Meridian 1.

- one or more network loops, as required
- appropriate CPU BootROM daughter board (containing AML/CSL-related firmware)

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

- 18-pair cables for voice ports
- proper commercial power line cord

***Note:*** The Modular Option EC card set supports System 21/21 A and System 51/61/71 only.

# Meridian 1 software requirements

Along with the above hardware requirement, the following Meridian SL-1 software packages are also needed:

- Meridian 1 X11 Release 14 or later
- Make Set Busy (MSB - 17)
- Basic ACD features (BACD - 40)
- Automatic Call Distribution - package A (ACDA - 45)
- AML/CSL link (Option 77)
- Integrated Message System (IMS - 35)
- Message Waiting Center (MWC - 46)
- End-to-end signalling (EES - Option 10)

## Network Message Service

Network Message Service (NMS) is an optional feature which allows a single Meridian Mail system to support multiple Meridian 1 sites. If you need NMS, the additional requirements *for each site* are as follows:

- Meridian 1 software release X11 Release 16.55 or later
- AML/CSL Primary Rate Access or AML/CSL Signalling Link (PRA/ISL) (Option 145/6 or 145/7)
- Advanced AML features (NTWK - Option 148)
- Network Message Services (NMS - Option 175)
- Message Waiting Center (MWC - 46, and ACD options 40, 45 )

  ***Note:*** Tandem nodes, which are nodes in the NMS network that pass information between the originating (remote site/s) and terminating nodes (main site), do not require the MWC (40, 45, 46) and NMS (175) options.

## Hospitality Voice Services

Hospitality Voice Services (HVS) is a voice messaging system that is designed specifically for the hospitality industry (hotels, inns, resorts, and so on). Some of the software requirements for HVS are listed below.

If you are purchasing a property management system, it must follow specifications 3.1 or later. To support a property management system, the following basic packages are required on the Meridian 1:

- Controlled Class of Service (CCOS)
- Background Terminal Facility (BGD)
- Property Management System Interface (PMSI or PMS)
- Room Status (RMS)

For lamp status, the following is required:

- Message Center (MWC)

Optional packages for PMSI are

- Message Registration (MR)
- Automatic Wake Up (AWU)

  ***Note:*** PMSI is not compatible with the following packages: AUTOVON (DSN), Centralized Attendant Services (CAS), and Coordinated Dialing Plans (CDP).

For HVS, the additional requirements are

- Meridian 1 X11 Release 16 or later
- Recorded Announcement (RAN)
- Do-Not-Disturb, Individual (DNDI)
- End-To-End Signalling (EES)
- Intercept Treatment (INTR)
- Make Set Busy (MSB)
- Digit Display (DDSP)
- Integrated Message System (IMS)
- Basic Automatic Call Distribution

- ACD CDR Queue Record
- Auxiliary Processor Link (APL)
- Hospitality Voice Services (HVS)
- Digit Key Signalling (DKS)

  ***Note:*** This feature may also be referred to as "Automatic End to End Signalling."

## Information to have on hand

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

- completed work order data forms (see Appendix D)
- equipment room floor plan
- building cable plan
- installation plans
- Meridian Mail NTPs
  - — *System Administration Guide* (NTP 555-7001-30x)
  - — *Installation and Maintenance Guide* NTP 555-7061-250
  - — *Maintenance Messages (SEERs)* (NTP 555-7001-510)
- Meridian 1 NTPs
  - — *Meridian 1 System Options 21, 51, 61, 71, Power Engineering Guide* (NTP 553-3001-152)

The work order should include

- system and terminal cross-connect assignments
- a detailed listing of the equipment and services ordered

# Pre-installation inspections

Table 4-1 identifies the items that should be inspected and signed off before starting the installation.

**Table 4-1**
**Pre-installation inspection checklist**

| For | Ensure the following are completed: |
|---|---|
| Equipment room | • The equipment room complies with physical and environmental requirements.<br>• Utility outlets are installed.<br>• Lighting is installed.<br>• The equipment room is cleaned and prepared.<br>• The cabinet location is marked on the equipment room floor. |
| Peripheral device locations | • The terminal, printer, modem, A/B switchbox, and PC locations are ready.<br>• AC outlets are provided.<br>• Sufficient and appropriate terminal connecting blocks are provided. |
| General inspections | • Building cross-connect terminals are provided.<br>• Conduits or floor-ducts to terminal locations (including service fittings) are installed.<br>• Access conduit for raceway is placed.<br>• Sufficient terminal blocks are provided.<br>• Sufficient cross-connect wires are provided. |

## Preparing for Meridian Mail delivery

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

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.
- 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 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 wrist strap is included with the equipment. When using the ESD wrist 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 5: Planning spares requirements

Table 5-1 lists the mean time between failures (MTBF) for the field-replaceable components of the Meridian Mail system. Table 5-2 lists the number of spares of each item a branch should stock.

Table 5-1 lists the mean time between failures (MTBF) for the field-replaceable components of the Meridian Mail system, and Table 5-2 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. When planning spares, consider the sizes of the systems being serviced.

The MTBF of the disk drives used in Meridian Mail is 17 years for the $3^1/_2$-inch drives, 11 years for the $5^1/_4$-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.

**Table 5-1**
**Spares planning—Mean time between failures (MTBF)**

| Components serviced | Code | MTBF (years) |
|---|---|---|
| 300-Mbyte disk (no power) | NT6P06AA | 11.0 |
| 300-Mbyte disk (with power) | NT6P43AA | 11.0 |
| 1-Gbyte disk (no power) | NT6P07AA | 16.0 |
| 1-Gbyte disk (with power) | NT6P44AA | 16.0 |
| MMP40 | NT6P97AA | 15.0 |
| Utility with modem | NT6P03AA | 34.6 |
| Utility without modem | NT6P42AA | 34.6 |
| VP4 | NT6P04AA | 54.0 |
| VP8 | NT6P08AA | 27.0 |
| CEPS | NT8D29AA | 90.0 |
| DCEPS | NT6D41AA | 187.0 |
| Viper tape drive | NT6P05AA | 2.9 |
| 2.5-Gbyte Tandberg tape drive unit | NT6P05BA | 2.9 |
| Total system | — | 6.0 |

***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 3-node unshadowed 32-port, 200-hour system.

**Table 5-2**
**Spares planning—Number of spares required**

| Components serviced | Code | Number of units serviced by branch * | | | | |
|---|---|---|---|---|---|---|
| | | 1 | <5 | <10 | <20 | <30 |
| 300-Mbyte disk (no power) | NT6P06AA | 1 | 2 | 3 | 3 | 3 |
| 300-Mbyte disk (with power) | NT6P43AA | 1 | 2 | 3 | 3 | 3 |
| 1-Gbyte disk (no power) | NT6P07AA | 1 | 2 | 3 | 3 | 3 |
| 1-Gbyte disk (with power) | NT6P44AA | 1 | 2 | 3 | 3 | 3 |
| MMP40 | NT6P97AA | 1 | 2 | 2 | 3 | 3 |
| 68K | NT6P02AA | 1 | 2 | 2 | 3 | 3 |
| Utility with modem | NT6P03AA | 1 | 2 | 2 | 2 | 2 |
| Utility without modem | NT6P42AA | 1 | 1 | 2 | 2 | 2 |
| VP4 | NT6P04AA | 1 | 1 | 2 | 2 | 2 |
| VP8 | NT6P08AA | 1 | 2 | 2 | 3 | 3 |
| CEPS | NT8D29AA | 1 | 1 | 2 | 2 | 2 |
| DCEPS | NT6D41AA | 1 | 1 | 2 | 2 | 2 |
| Viper tape drive | NT6P05AA | 1 | 1 | 2 | 2 | 2 |
| 2.5-Gbyte tape drive unit | NT6P05BA | 1 | 1 | 2 | 2 | 2 |
| ***** Assumes that when a spare is committed, a replacement will be available within one week. | | | | | | |

# Chapter 6: Reference documents

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

- *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 A: Component list

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

| Component | PEC Code | Part No. | Order code |
|---|---|---|---|
| 300-Mbyte disk drive | NT6P06AA | A0351371 | —— |
| 300-Mbyte disk drive plus power | NT6P43AA | A0394780 | —— |
| 300-Mbyte disk pack (Seagate ST3390N) | NT6P06AA | A0602257 | —— |
| 1.0-Gbyte disk drive module | NT6P07AA | A0391976 | —— |
| 1.0-Gbyte disk drive module with auxiliary power (Maxtor or Seagate) | NT6P44AA | A0394781 | —— |
| 1.2-Gbyte disk drive (Seagate ST31230N) | A0616792 | —— | —— |
| MMP40 card | NT6P97AA | A0405603 | —— |
| Utility card (with modem) | NT6P03AA | A0391972 | —— |
| Utility card (without modem) | NT6P42AA | A0394182 | —— |
| VP4 Card | NT6P04AA | A0391973 | —— |
| VP8 Card | NT6P08AA | A0392020 | —— |
| Viper tape unit | NT6P05AA | A0391974 | —— |
| Tandberg tape unit | NT6P05BA | A0630014 | —— |
| Tandberg tape drive cleaning kit | —— | A0633585 | —— |
| CEPS (ac) | NT8D29AA | A0358724 | —— |
| CEPS (dc) | NT6D41AA | A0359960 | —— |
| **Power and cable equipment** | | | |
| Ground extension cable | QCAD310 | A0336878 | —— |
| Alarm modem cable | NT6P0112 | A0393845 | —— |
| Adapter cable | NT6P0113 | A0393846 | —— |

**—continued—**

| Power and cable equipment (continued) | PEC Code | Part No. | Order code |
|---|---|---|---|
| EVB cable 76.2 cm (30 in.) | NT6P0124 | A0407824 | —— |
| EVB cable 152.4 cm (60 in.) | NT6P0125 | A0407825 | —— |
| EVB cable 243.84 cm (96 in.) | NT6P0126 | A0407826 | —— |
| RS-232 5-port fanout cable | NT6P0109 | A0393842 | —— |
| RS-232 4-port fanout cable | NT6P0110 | A0393843 | —— |
| I/O to backplane cable | NT6P0123 | A0407823 | —— |
| I/O to QPC414 cable | NT8D86AD | A0362869 | —— |
| I/O to QPC513 cable | —— | P0695822 | —— |
| CSL to I/O cable | NT6D4410 | A0363749 | —— |
| Net Loop to I/O cable | NT6P0122 | A0366395 | —— |
| INMAC 328 terminal adapter | —— | A0351509 | —— |
| RS-232 terminal to printer cable | NT4R59AA | A0347499 | —— |
| RS-232 cable | —— | A0363518 | —— |
| 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 | —— |
| A/B data switchbox | NT3M50AD | A0345353 | —— |
| Ven-Tel 2400–33 MNP/X.modem (Rev 5.2) | NT3M50AF | A0345963 | —— |
| Ven-Tel 9600plus II | —— | A0381458 | —— |
| 2400-BPS UDS modem (EC 2440) | NT3M50AC | A0345346 | —— |
| NT Personal Printer | NT3M56AC | A0345125 | —— |
| Networking kit | NT9D67AA | AS7007 | —— |
| 50-position EMI filter and mounting | —— | A0361136 | —— |

**—continued—**

| User guides | PEC Code | Part No. | Order code |
|---|---|---|---|
| Meridian Mail user guides (15) | NT5R25AA | A0403732 | P0741311 |
| Guest Administration Console/Guest Voice Messaging Guide | —— | —— | P0741307 |
| **—end—** | | | |

# Appendix B: Cable and wiring plan

**Table 8-1**
**Cable and wiring plan data form**

| DN | TN | 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 |

**—continued—**

**Table 8-1 (continued)**
**Cable and wiring plan data form**

| DN | TN | Name | Features/Remarks | Terminal device | Blocks | Color |
|---|---|---|---|---|---|---|
| | | | | | | V/OR |
| | | | | | | V/GR |
| | | | | | | V/BR |
| | | | | | | V/SL |
| **—end—** | | | | | | |

# Appendix C: Site survey 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: _____

Permit(s) 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: _____

**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 Meridian 1 software release: _____

Meridian 1 Generic X11 Release 14 (or later) required

Meridian 1 Generic X11 Release 16.55 (or later) required if the Network Messaging Service (NMS) feature is purchased

( ) Meridian 1 software conversion required

Release _____ to Release _____

( ) Meridian 1 software packages equipped

| | |
|---|---|
| MSB 17 | ( ) |
| BACD 40 | ( ) |
| ACDA 45 | ( ) |
| CSL 77 (ISDN/AP link) | ( ) |
| IMS 35 | ( ) |
| MWC 46 | ( ) |
| NMS 175 (for NMS) | ( ) |
| ISDN PRA/ISL 145/6 or 145/7 (for NMS) | ( ) |
| NTWK 148 (for NMS) | ( ) |
| EES 10 (for NMS) | ( ) |

**4. Meridian Mail model considerations** (See the chapter on “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 Northern Telecom [Nortel] representative for a list of available languages)

| | |
|---|---|
| Voice Menus | Yes ( ) No ( ) |
| Networking | Yes ( ) No ( ) |
| Meridian Mail ACCESS | Yes ( ) No ( ) |
| AdminPlus/Meridian Mail Reporter | Yes ( ) No ( ) |
| Network Message Services | Yes ( ) No ( ) |
| Outcalling | Yes ( ) No ( ) |
| Fax Outcalling | Yes ( ) No ( ) |
| AMIS | Yes ( ) No ( ) |
| Voice Forms | Yes ( ) No ( ) |
| HVS | Yes ( ) No ( ) |
| Hospitality | Yes ( ) No ( ) |
| Multiple Administration | Yes ( ) No ( ) |
| Multi-Customer | Yes ( ) No ( ) |
| Bilingual Prompting | Yes ( ) No ( ) |
| Install/Data Tape | Yes ( ) No ( ) |
| Backup Tape(s) | Yes ( ) No ( ) |
| Keycode Available | Yes ( ) No ( ) |

### 6. Hardware

PBX Equipment cabinets Quantity Type

_____

_____

( ) Meridian 1 CPU compatibility

CPU ROM upgrades required: Yes ( ) No ( )

Memory upgrade required: Yes ( ) No ( )

( ) Input/Output devices

Space available for ESDI/MSDL: Yes ( ) No ( )

( ) NMS requirements (if needed)

ISDN/PRI hardware: Yes ( ) No ( )

### 7. Equipment room information

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

### 8. Power and ground considerations

Separately grounded 110 V ac outlet for Meridian Mail: Yes ( ) No ( )

( ) Calculate Maximum Cable Distance

PBX 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 installation conform to NTP and Product Bulletins? Yes ( ) No ( )

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

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

**11. Comments and recommendations**

# Appendix D: Data forms and site log form

This appendix contains data entry forms that help in the planning and configuration of Meridian Mail. They should be filled in 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.
- ***Meridian Mail TNs (SYS-2)*** This is a table for planning the port locations and the corresponding TNs.
- ***Meridian 1 Data Forms (PBX-x)*** This form contains data corresponding to Meridian 1 prompts that require an entry. This data should be written in before initiating the system start-up procedures.

  The filled-in PBX Data Forms should be used with the *Installation and Maintenance Guide* (NTP 555-7061-210). The person inputting PBX data must be familiar with the use of the Meridian 1 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*, please refer to the section called “NTP references” in the “About this document” chapter for the exact NTP number.

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.

## System Data Form SYS-1

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

| | | |
|---|---|---|
| Serial Number | | _____ |
| System Name | | _____ |
| System DN Length | | _____ |
| Meridian 1 customer number (0-99): | | _____ |
| System DNs | Default | Site |
| 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, ACCESS) | 3602 | _____ |
| Full-Service Multimedia ACD DN: (if Fax on Demand is installed) | 3603 | _____ |

| Meridian Mail TNs | | | | | | | | SYS-2 |
|---|---|---|---|---|---|---|---|---|
| **Port number** | **Basic or full** | **Multi-media or voice** | **Loop (0-159)** | **Shelf (0-1)** | **Card (2 or 3)** | **Unit (0-7)** | **ACD DN XXXX** | **Key1-SCN XXXX** |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |
| 6 | | | | | | | | |
| 7 | | | | | | | | |
| 8 | | | | | | | | |
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| **Meridian Mail TNs (continued)** | | | | | | | | **SYS-2** |
|---|---|---|---|---|---|---|---|---|
| **Port number** | **Basic or full** | **Multi-media or voice** | **Loop (0-159)** | **Shelf (0-1)** | **Card (2 or 3)** | **Unit (0-7)** | **ACD DN XXXX** | **Key1-SCN XXXX** |
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| 32 | | | | | | | | |
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**—continued—**

| **Meridian Mail TNs (continued)** | | | | | | | | **SYS-2** |
|---|---|---|---|---|---|---|---|---|
| **Port number** | **Basic or full** | **Multi-media or voice** | **Loop (0-159)** | **Shelf (0-1)** | **Card (2 or 3)** | **Unit (0-7)** | **ACD DN XXXX** | **Key1-SCN XXXX** |
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**—continued—**

**Meridian Mail TNs (continued)** **SYS-2**

| Port number | Basic or full | Multi-media or voice | Loop (0-159) | Shelf (0-1) | Card (2 or 3) | Unit (0-7) | ACD DN XXXX | Key1-SCN XXXX |
|---|---|---|---|---|---|---|---|---|
| 93 | | | | | | | | |
| 94 | | | | | | | | |
| 95 | | | | | | | | |
| 96 | | | | | | | | |

The Meridian 1 DN and Meridian Mail System DNs should not conflict with existing DNs in the Meridian 1 numbering plan. If the System DNs are not provided with the customer order, the defaults are used.

For Loop, Shelf, Card, and Unit, the allowable responses are shown in parentheses.

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 TNs. For example

7-0-1-0 (Basic Voice)
7-0-1-1 (Basic Voice)
7-0-1-2 (Full Voice)
7-0-1-3 (Full Voice)
7-0-1-4 (Full Voice)
7-0-1-5 (Full Voice)
7-0-1-6 (Full Voice)
7-0-1-7 (Full Voice)

Multimedia ports use two TNs. When you list a multimedia port, the Unit portion of the TN for the next port should increase by 2. For example

7-0-1-0 (Basic Voice)
7-0-1-1 (Basic Voice)
7-0-1-2 (Full Multimedia)
7-0-1-4 (Full Multimedia)
7-0-1-6 (Full Voice)
7-0-1-7 (Full Voice)

**—end—**

# Meridian 1 Data Form (common items) PBX-1

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

This form contains all site-specific data required to configure the Meridian 1 for Meridian Mail. Only those prompts specific to Meridian Mail configuration are listed below. For more information on these overlays, see the *Installation and Maintenance Guide* (NTP 555-7061-250) and the *X11 Input/Output Guide* (NTP 553-3001-400).

| Overlay | Prompt | Site response | Comments |
|---|---|---|---|
| 15 | CUST | _____ | PBX customer number (range 0-99) |
| | ATDN | _____ | Attendant DN |
| | FNAD | _____ | DN to which Call Forward No Answer DID calls are routed |
| | FNAN | _____ | DN to which Call Forward No Answer non-DID calls are routed |
| | FNAL | _____ | DN to which Call Forward No Answer are routed |
| | CFNA | _____ | Number of ring cycles before calls are forwarded. (range is 1-15, default is 4) |
| 17 | CTYP | _____ | Card type (MSDL or ESDI) |
| 11 | TN | _____ | ACD agent TN in the form ll ss cc uu (loop shelf card unit) (Use values from the SYS-2 data form.) |
| | CUST | _____ | PBX customer number |
| | KEY | 0 ACD xxxx yyyy | Define key 0 as an ACD agent key. DN xxxx is the Primary ACD DN. Basic-service, full-service, and multimedia ports each have a unique Primary DN. The Primary DN can be any unused number. yyyy is the position ID which Meridian 1 uses to distribute calls to agents. It can be any unused number. |
| | | 1 SCN zzzz | Define key 1 as a single call non-ringing DN, where zzzz is an unused DN. |
| | | ___MSB | Define key (1-9) as a make set busy key. |
| | | ___NRD | Define key (1-9) as a not ready key. |
| | | ___TRN | Define key (1-9) as a transfer key. |
| | | ___AO3 | Define key (1-9) as a 3-party conference key (this is necessary for Thru-dial.). |
| | | ___RLS | Define key (1-9) as a release key. |

# Meridian 1 Data Form (for each queue: basic-service, full-service, multimedia) PBX-2

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

**Basic-service voice**

| Overlay | Prompt | Site response | Comments |
|---|---|---|---|
| 23 | CUST | _____ | PBX customer number |
| | ACDN | _____ | Basic-Service Voice DN |
| | EES | _____ | End-to-End Signalling (Enabled or Disabled) |
| | VSID | _____ | Meridian Mail identifier (defined in LD 17) |
| | MAXP | _____ | Maximum number of ACD agents (voice ports) |
| | NCFW | _____ | Night call forward DN for ACD calls (attendant DN) |

**Full-service voice**

| Overlay | Prompt | Site response | Comments |
|---|---|---|---|
| 23 | CUST | _____ | PBX customer number |
| | ACDN | _____ | Voice Messaging DN (Full-Service Voice DN) |
| | EES | _____ | End-to-End Signalling (Enabled or Disabled) |
| | VSID | _____ | Meridian Mail identifier (defined in LD 17) |
| | MAXP | _____ | Maximum number of ACD agents (voice ports) |
| | NCFW | _____ | Night call forward DN for ACD calls (attendant DN) |
| | ACDN | _____ | Express Messaging DN (optional) |

**Full-service multimedia**

| Overlay | Prompt | Site response | Comments |
|---|---|---|---|
| 23 | CUST | _____ | PBX customer number |
| | ACDN | _____ | Multimedia DN |
| | EES | _____ | End-to-End Signalling (Enabled or Disabled) |
| | VSID | _____ | Meridian Mail identifier (defined in LD 17) |
| | MAXP | _____ | Maximum number of ACD agents (voice ports) |
| | NCFW | _____ | Night call forward DN for ACD calls (attendant DN) |

# Meridian Mail NMS Data Form PBX-3

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

This form contains all site-specific data required to configure the NMS option on the Meridian 1 for Meridian Mail. Only those prompts specific to Meridian Mail configuration are listed below. For more information on these overlays, see the appropriate Meridian 1 data administration manuals. See also the chapter on "Configuring the Meridian 1" in the *Meridian Mail Installation and Maintenance Guide* (NTP 555-7061-250).

| Overlay | Prompt | Site response | Comments |
|---|---|---|---|
| 15 | REQ CHG | | |
| | TYPE | CDB | Customer Data Block |
| | MATT | NO | |
| | ISDN | YES | |
| | PNI | _____ | Private Network Identifier |
| | HLOC | _____ | Home Location code (ESN) of the Meridian 1 (Range 100-999) |
| | LSC | _____ | Local Steering Code (CDP) of the Meridian 1 |
| 16 | REQ_____ | NEW or CHG | |
| | TYPE | RDB | Route Data Block |
| | CUST | _____ | Meridian 1 customer number |
| | ROUTE | _____ | Route number |
| | PNI | _____ | Customer Private Network ID of the non-local target Meridian 1 |
| | VCRD | YES | |
| | TRO YES | | |
| | INAC | YES | |
| 16 | REQ CHG | | |
| | ISDN | YES | To update the ISDN records |
| | IFC | Meridian 1 | Interface type is Meridian 1 |
| | RLS | 16 | Minimum switch software release at the far end |
| 23 | NCFW | _____ | Meridian Mail DN. (Use network format if this is an NMS satellite site.) |

# General Options Data Form MM-1
## (for single-customer systems)

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 number : | _____ | PBX customer no. |
| System addressing length: | _____ | (0 to 18) |
| Voice Menus & Announcements: | _____ | Disabled or Enabled |
| Voice Forms: | _____ | Disabled or Enabled |
| Fax on Demand: | _____ | Disabled or Enabled |
| Hospitality: | _____ | Disabled or Enabled |
| Meridian Mail Networking: | _____ | Disabled or Enabled |
| Networking Messages Services: | _____ | Disabled 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: | _____ | mm/dd/yy yy/mm/dd dd/mm/yy |
| SEER printing: | _____ | Disabled or Enabled |
| 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) which can be modified, if necessary, or left as is.

# General Options Data Form MM-2

## (for system administration on multi-customer systems)

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 number : | _____ | PBX customer no. |
| System DN length: | _____ | (0 to 18) |
| ACCESS default customer number (only if ACCESS is installed): | _____ | PBX customer no. |
| Integrated mailbox administration default customer number | _____ | 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/yy |
| SEER printing: | _____ | Disabled or Enabled |
| 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) which can be modified, if necessary, or left as is.

# General Options Data Form MM-3
## (customer administration on multi-customer systems)

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 number | _____ | PBX customer no. |
| System DN length: | _____ | (0 to 18) |
| ACCESS default customer number (only if ACCESS is installed): | _____ | PBX customer no. |
| Integrated mailbox administration default customer number | _____ | 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.): | _____ | Private, Residential, or Hospitality |
| Multi-Customer: | _____ | Disabled or Enabled |
| Multiple Administration Terminals: | _____ | Disabled or Enabled |
| Disk-to-disk backup: | _____ | Disabled or Enabled |
| Meridian ACCESS: | _____ | Disabled or Enabled |
| AdminPlus (Meridian Mail Reporter): | _____ | Disabled or Enabled |
| Integrated Mailbox Administration: | _____ | Disabled or Enabled |
| Voice Messaging: | _____ | Disabled or Enabled |
| AMIS: | _____ | Disabled or Enabled |
| Dual Language Prompting: | _____ | Disabled or Enabled |
| Outcalling: | _____ | Disabled or Enabled |
| Voice Menus & Announcements: | _____ | Disabled or Enabled |
| Voice Forms: | _____ | Disabled or Enabled |
| Fax on Demand: | _____ | Disabled or Enabled |
| Hospitality: | _____ | Disabled or Enabled |
| Meridian Mail Networking: | _____ | Disabled or Enabled |

**—continued—**

## General Options Data Form (continued) MM-3
## (customer administration on multi-customer systems)

| | | |
|---|---|---|
| Class of Service selection: | _____ | (up to 15 COSs) |
| Attendant DN: | _____ | (default 0, up to 30 digits) |
| Date format for administration and maintenance reports: | _____ | mm/dd/yy yy/mm/dd dd/mm/yy |
| SEER printing: | _____ | Disabled or Enabled |
| 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) which can be modified, if necessary, or left as is.

**—end—**

# Voice Messaging Options Data Form MM-4
## (for MMUI systems)

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 Enabled |
| 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 |
| * 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): | _____ | Standard 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) which can be modified, if necessary, or left as is.

# Voice Messaging Options Data Form MM-5
## (for VMUIF systems)

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 |
| * | 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) which can be modified, if necessary, or left as is.

# Voice Security Options
## (for single-customer systems)

**MM-6**

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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) | | |
| Class of Service Name: | _____ | Up to 30 characters |
| Personal Verification Changeable by User: | _____ | Yes or <u>No</u> |
| Voice Storage Limit (minutes): | _____ | Range 1-360, default 3 |
| Maximum Message Length (mm:ss): | _____ | 00:30 to 99:00, 10 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: | _____ | <u>Yes</u> or No |
| 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 No |
| * | 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 No |
| * | DNU DTMF Confirmation Required: | _____ | Yes or No |
| | Remote Notification Capability: | _____ | Yes or No |
| ** | Remote Notification Restriction/Permission Codes: | _____ | Unrestricted, On_switch, Local, Long_distance_1, Long_distance_2 |
| ** | Remote Notification Keypad Interface | _____ | Yes or No |
| | 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 No |
| | Monday | _____ | Yes or No |
| | Tuesday | _____ | Yes or No |
| | Wednesday | _____ | Yes or No |
| | Thursday | _____ | Yes or No |
| | Friday | _____ | Yes or No |
| | Saturday | _____ | Yes or No |
| | Receive AMIS messages: | _____ | Yes or No |
| # | Compose/send AMIS messages: | _____ | Yes or No |
| # | 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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 $)

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

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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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)

Access 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—**

## Voice Menu Definition Data Form (continued) MM-11

Greeting (plan what you want to record):

Menu choices (plan what you want to record):

**—end—**

# Announcement Definition Data Form MM-12

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

This form contains guidelines for defining an announcement and planning what the announcement will say. 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)

Access 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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 ?)

Access 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 telset: _____ (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 telset: _____ (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. This will not appear on the Fax Item Definition screen.):

_____

_____

# Networking Data Form (part 1) MM-14

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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._____ (up to 50)

Mailbox numbering follows Dialing Plan? Yes___ No___

- If Yes, Mailbox = DN? Yes___No___ If Yes, no mailbox prefix
  If No, enter mailbox Prefix: _____
- If No, 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: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

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 |

# NMS Data Form MM-15

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

This form contains site-specific data for the Network Message Service (NMS) feature. For more information, see the “Network Message Service” and “Meridian Networking” and “Network Message Service” chapters in the *Networking Services Administration Guide* (NTP 555-7001-335).

Networking DN: _____

Networking modem DNs: _____ _____ _____

**NMS Networking Administration Parameters**

Location Number: _____ Range 1-500

Location Name: _____ Max. 32 characters

Location is network message center? (NMS+Network sites) _____ Yes/No

Dialing plan: _____ ESN/CDP/hybrid

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. 49 for CDP/hybrid, 1 for ESN):

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

5._____ 6._____ 7._____ 8._____ (up to 50)

Mailbox numbering follows dialing plan: Yes___No___

If No, enter Mailbox Prefix: _____

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

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

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

If your system has both NMS and Networking features installed, fill in the Networking Data Form (MM-14) too. Also, fill out the list of remote locations. Message Center = Yes defines location as a Network Message Center serving other locations.

| Location Number | Location Name | Message Center (Yes/No?) |
|---|---|---|
| _____ | _____ | _____ |
| _____ | _____ | _____ |
| _____ | _____ | _____ |

# Site Log Form LOG-1

Customer: _____ Nortel Rep: _____

Location: _____ Customer Rep: _____

Date: _____ Job #: _____ Meridian Mail Release: _____

Site Log Number: _____

| Date | Event |
|---|---|
| | |
| | |
| | |
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# Index

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# Reader's Response Form for

**Modular Option EC**
***Site and Installation Planning*, 555-7061-200,**
**August 1995**

**Tell us about yourself:**

**Name:** _____ **Date:** _____

**Company:** _____

**Address:** _____

_____

**Occupation:** _____ **Phone:** _____

1. What is your level of experience with this product?

   ❑ New user ❑ Intermediate ❑ Experienced ❑ Programmer

2. How do you use this book?

   ❑ Learning ❑ Procedural ❑ Problem solving ❑ Reference

3. Did this book meet all of 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? (For example, books can also be evaluated in many other ways, including ease of information retrieval, presentation, and use of reading aids, such as diagrams.)

   _____

   _____

*Please return your comments by fax to (416) 597-7104, or mail your comments to: Customer Documentation, Northern Telecom, Toronto Lab, 522 University Ave., 12th Floor, Toronto, ON, Canada M5G 1W7*

NORTEL

# Reader's Response Form

# Meridian Mail Modular Option EC

Site and Installation Planning

Customer Documentation
Northern Telecom
522 University Avenue, 12th Floor
Toronto, ON, Canada
M5G 1W7

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