

DEC 3000 Model 800/800S/900 AXP

Options Guide

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Preface

Audience This guide is intended for all users of the DEC 3000 Model 800 /800S/900 AXP system. It describes how to install and remove internal options.

Purpose of This Guide This guide provides the following information for internal options:

- How to install
- How to test for successful installation
- Drive SCSI ID settings

Structure of This Guide This guide is organized as follows:

Designation	Contents
Chapter 1	Overview of options, including a list of internal options and their locations in the system unit.
Chapter 2	What you need to do to prepare your system for adding one or more options, including shutting down software, checking system configurations, shutting down hardware, and removing panels.
Chapter 3	Information on installing a CD, tape or diskette drive in the system unit.
Chapter 4	Information on installing a fixed disk drive in the system unit.

Designation	Contents
Chapter 5	Information on memory modules, including how to determine which modules you need, installing them in and removing them from the system unit.
Chapter 6	Information on TURBOchannel options, including an overview of TURBOchannel and the system unit option positions and installing and removing them from the system unit.
Chapter 7	What you need to do to replace panels and confirm that options were installed correctly inside your system unit.
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Two Ways To Add Options

There are two ways to add options inside the system unit: add the options yourself or have a Digital service representative add them.

If you choose to add the options, note that system preparation takes about 20 minutes, additions take about 10 to 15 minutes per option, and system restoration takes about 10 minutes, on the average.

What You Should Know Beforehand

The instructions in this guide assume you are prepared to open the system unit, disconnect and connect internal cables, and use antistatic precautions. You should be familiar with concepts such as SCSI addresses, and the following diagnostic test displays:

- System power-up messages
- Configuration displays resulting from the `show config`, `show memory`, and `show device console` commands

For more information on these diagnostic test displays, refer to the *DEC 3000 Model 800/800S/900 AXP Owner's Guide*. For more information on SCSI concepts, refer to *Small Computer System Interface: An Overview*.

CAUTION: Option Damage

Improper addition of a drive or module could lead to damage and failure of that drive or module, or to damage of the system. The system warranty may not cover such a failure.

Conventions in This Guide

The following conventions are used in this guide:

<code>show config</code>	Words in this format indicate commands that you must enter exactly as shown. For example: Use the <code>show config</code> command.
WARNING:	Warnings contain information to prevent personal injury. Read these carefully.
CAUTION:	Cautions contain information to prevent damage to equipment or software. Read these carefully.
IMPORTANT:	Important notations contain information to allow your system to work properly.
OpenVMS	This designation represents the OpenVMS Alpha AXP operating system.
DEC OSF/1	This designation represents the DEC OSF /1 Alpha AXP operating system.
<i>Italics</i>	Italics are used for emphasis or to indicate the title of a manual.

**IMPORTANT:
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Product
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SPDs also describe a software product's system environment, and identify required and optional hardware and software. All information contained in the SPD is valid in the international marketplace.

For more information on the SPD for your operating system, please contact your Digital sales representative.

1

Options Overview

External Options

A number of options are available for the system. Some, such as drives and modules, are internal options. Others, such as a printer or modem, are external options connected to the system by a cable.

This chapter lists and illustrates internal options for the system and shows where to install them in the system unit.

Internal Options

Drives

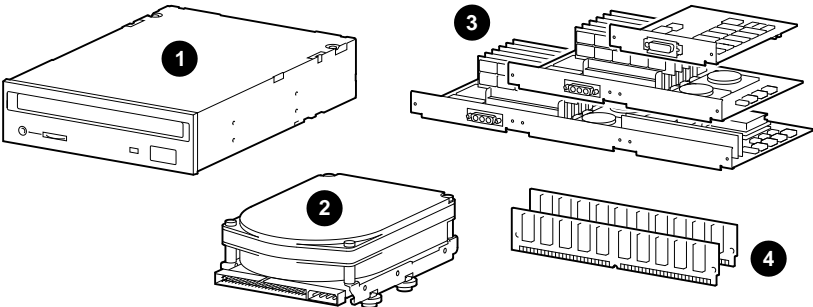
Your system unit can hold up to two half-height removable-media drives, that is, drives from which the storage medium is removable. To add more than two removable-media drives, you will need an expansion box.

In addition to the removable-media drives, you can have up to four half-height fixed disk drives in the system unit.

**Internal
Options
Illustration**

Figure 1-1 shows some of the internal option types you can add to the system unit.

Figure 1-1 Internal Option Types You Can Add



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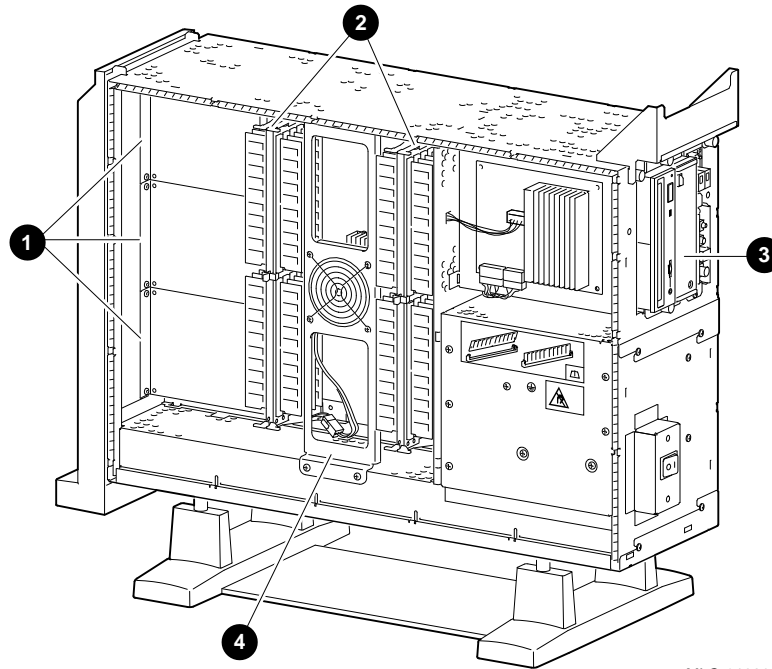
- ❶ CD/tape/diskette drive
- ❷ Fixed disk drive
- ❸ TURBOchannel modules
- ❹ Memory modules

Internal Options

Location of Internal Options: Left Side and Front

Figure 1-2 shows where to install the TURBOchannel modules ❶, memory modules ❷, and removable-media drives ❸ inside the system unit. Note that Figure 1-2 shows the system unit with the system cover, side panels, and front panel removed.

Figure 1-2 Option Locations (Left Side and Front)



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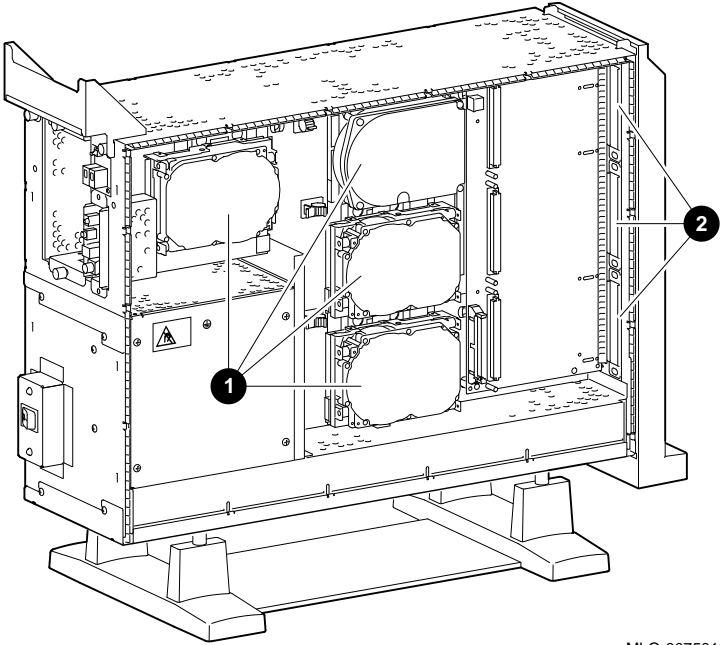
Note

For clarity, the rest of the figures in this manual do not show the impingement fan ❹. However, you do not need to remove the impingement fan to add or install options.

Location of Internal Options: Right Side

Figure 1-3 shows where to install the fixed disk drives **1** and TURBOchannel modules **2** inside the system unit. Note that Figure 1-3 shows the system unit with the system cover, side panels and front panel removed.

Figure 1-3 Option Locations (Right Side)



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2

Preparing to Add Internal Options

IMPORTANT: Read First

It is important to read this chapter before you install any of the internal options described in this guide.

Chapter Overview

This chapter covers the following information:

- Going to Console Mode
- Displaying the Configuration
- Shutting Down Hardware
- Removing Panels
- Using an Antistatic Wrist Strap

Going to Console Mode

Going to Console Mode

Back Up Your Files

If files are stored on a system disk, back them up following the instructions in your software documentation.

Shut Down Software

The procedure for shutting down your software will depend on whether or not your system is networked.

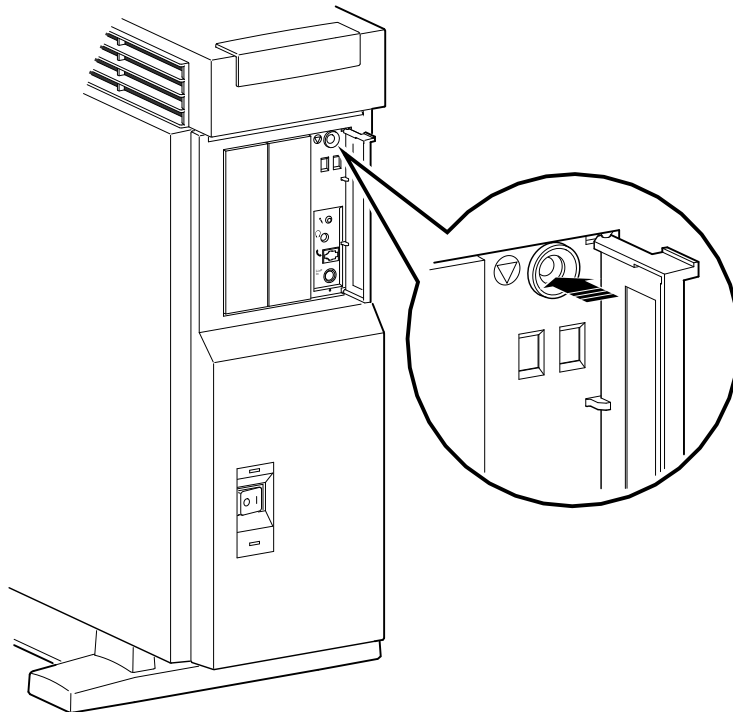
If you are...	See your...
Networked, or part of a cluster,	system manager.
<i>Not</i> networked, not part of a cluster,	software documentation.
Not sure whether you are networked,	system manager.

Going to Console Mode

Press the Halt Button

If you are not already in console mode (>>> prompt) after shutting down the software, put the system into console mode by pressing the halt button. The halt button is behind the door, as shown in Figure 2-1. The console prompt (>>>) should appear on the monitor.

Figure 2-1 Halt Button



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Displaying the Configuration

show device Display

If you are adding one or more drives, enter the `show device` command to show the drives installed in the system and their status. You should get a display similar to what is shown in Figure 2-2.

Figure 2-2 The show device Display

```
>>> show device

BOOTDEV      ADDR      DEVTYP     NUMBYTES   RM/FX  WP  DEVNAM  REV
-----      -
ESA0         08-00-2B-1D-1E-EF , THICK
DKA0         A/0/0     DISK       1.05GB     FX      RZ26   T368
DKA100      A/1/0     DISK       426.25MB   FX      RZ25   0700
DKA200      A/2/0     DISK       426.25MB   FX      RZ25   0700
DKA300      A/3/0     DISK       426.25MB   FX      RZ25   0700
DKA400      A/4/0     RODISK     .....    RM      WP  RRD42   4.3d
DKA500      A/5/0     DISK       .....    RM      RX26   0068
..HostID... A/7       INTR
..HostID... B/7       INTR

>>>
```

How to Read the show device Display

You should see the SCSI address for each drive in the ADDR column, as shown in Figure 2-2. The drive model is shown in the DEVNAM column. In this example, A/3/0 indicates an address of 3 on the SCSI-A (internal device) bus for an RZ25 drive. B/7 indicates the initiator (SCSI controller) for the SCSI-B (external device) bus.

You can have only one of each address (0-6) on each SCSI bus. Use the `show device` output to choose an unused SCSI address for drives you add to your system.

What You Need to Do

Record the information in the ADDR and DEVNAM columns for later reference. After adding a drive, you can compare the new system configuration with the previous one to make sure that all drives, including the ones you added, are present and functioning correctly.

If your drive does not display, it may be set to the same SCSI ID address as another drive. Change the SCSI address setting to ensure that each drive has a unique address.

The show memory Display

If you are adding or removing memory modules, enter the show memory command to display the amount of memory in the system.

Figure 2–3 The show memory Display

```
>>> show memory

DEC 3000 - M800 Memory: 64 Mbytes
-----
BANK #      MEMORY_SIZE      START_ADDRESS
-----
0           032 Mbytes       0x00000000
1           032 Mbytes       0x02000000
2           000 Mbytes       0x00000000
3           000 Mbytes       0x00000000
4           000 Mbytes       0x00000000
5           000 Mbytes       0x00000000
6           000 Mbytes       0x00000000
7           000 Mbytes       0x00000000

>>>
```

How to Read the show memory Display

Figure 2–3 shows an example of the display resulting from the show memory command. In this example, banks 0 and 1 contain 64 megabytes of memory (eight 8-megabyte modules). All other banks contain 0 megabytes, therefore, they are empty.

What You Need to Do

Record the information shown in the BANK # and MEMORY_SIZE columns for later reference. After adding or removing memory modules, you can compare the new system memory figure with the previous figure to make sure that all modules are installed and functioning correctly.

Displaying the Configuration

The show config Display

If you are adding one or more TURBOchannel options, enter the show config command to show the TURBOchannel modules currently installed in the system.

Figure 2-4 shows an example of the display resulting from the show config command.

Figure 2-4 The show config Display

```
>>> show config

DEC 3000 - M800
Digital Equipment Corporation
VPP PAL X5.41-82000101 - Built on 25-JUN-1994 00:00:00.00

TCINFO      DEVNAM      DEVSTAT
-----      -
              CPU      OK KN17-AA V1.x-S086-IO62- DECchip 21064 P3.0
              ASIC      OK
              MEM      OK
8
7
              NVR      OK
              SCC      OK
              NI       OK
              ISDN     OK
6
              SCSI     OK
1-PMAZC-AA   TC1
0-PMAGB-BE   TC0

>>>
```

How to Read the show config Display

The TCINFO column lists the system's TURBOchannel slots and the modules in each. Note that slots 0 through 5 are for TURBOchannel *option* modules (listed under DEVNAM as TC0 through TC5); slot 6 contains the built-in SCSI controller; and slots 7 and 8 are for built-in system devices.

Note that *if a TURBOchannel option module takes more than one slot, only one of its slot designations will be shown in the display.*

Displaying the Configuration

The "OK" in the DEVSTAT column indicates that the device has successfully completed the startup test.

Note that *some TURBOchannel option modules do not have a startup test*, therefore, no "OK" will appear for them.

In Figure 2-4, a PMAGB-BE module is installed in slot 0, and a PMAZC-AA is installed in slot 1. These are two TURBOchannel option modules that may be installed in your system.

What You Need to Do

Record the information in the TCINFO and DEVNAM columns for later reference. After adding a module, you can compare the new system configuration with the previous one to make sure that all modules are present and functioning correctly.

How to Identify Errors

If two question marks appear in the DEVSTAT column of the `show config` display, an error has been detected for that module.

If an error indicator appears, as shown in Figure 2-5, follow these steps:

1. Use the `show error` command, as shown in Figure 2-5, and note the FRU and error numbers. In this example, the FRU is 004, and the error number is 0060. The FRU is a field replaceable unit, a drive or module that can be replaced by your Digital service representative.
2. Refer to the *DEC 3000 Model 800/800S/900 AXP Owner's Guide*. It will explain how to contact your Digital service representative.

Displaying the Configuration

Figure 2-5 The show config Display with Error

```
>>> show config

DEC 3000 - M800
Digital Equipment Corporation
VPP PAL X5.41-82000101 - Built on 25-JUN-1994 00:00:00.00

TCINFO      DEVNAM      DEVSTAT
-----      -
              CPU      OK KN17-AA V1.x-S086-IO62- DECchip 21064 P3.0
              ASIC      OK
              MEM      OK
8
7
              NVR      OK
              SCC      ? 60
              NI      OK
              ISDN     OK
6
              SCSI     OK

1-PMAZC-AA   TC1
0-PMAGB-BE   TC0

>>> show error
?? 004      SCC 0x0060

>>>
```

See Chapter 7 for information on testing TURBOchannel options.

If no error indicators appear, proceed with shutting down the hardware.

Shutting Down Hardware

Shutdown Sequence

Turn off (O) the equipment in the following order:

1. System unit
2. Expansion boxes
3. Printer and modem
4. Monitor (Note that turning off the system unit will *not* automatically turn off the monitor.)

Leave the power cord plugged into the electrical outlet to help protect against static discharge, which might otherwise damage internal components.

Removing Panels

Selecting Panels

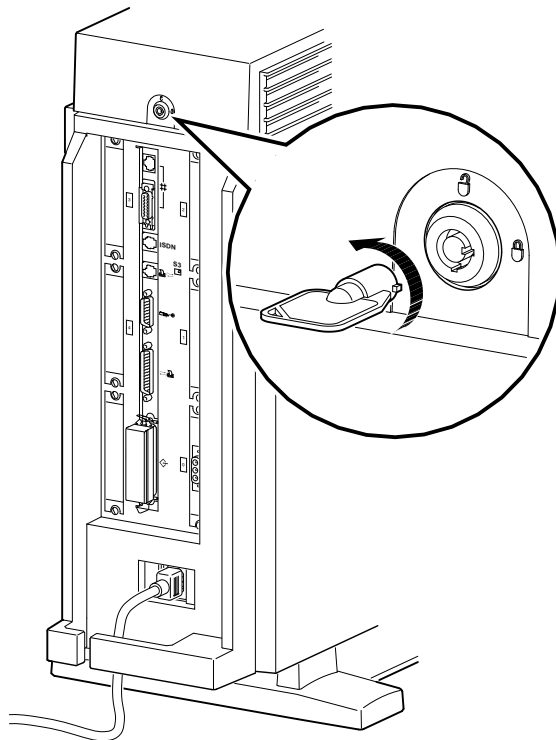
Depending on the options you plan to add, you may not need to remove all panels. Read the instructions for removing each panel to determine whether or not you need to remove that panel.

To remove the panels, follow these steps:

Step 1: Unlock Cover

Unlock the system cover, as shown in Figure 2-6.

Figure 2-6 Unlocking the System Cover

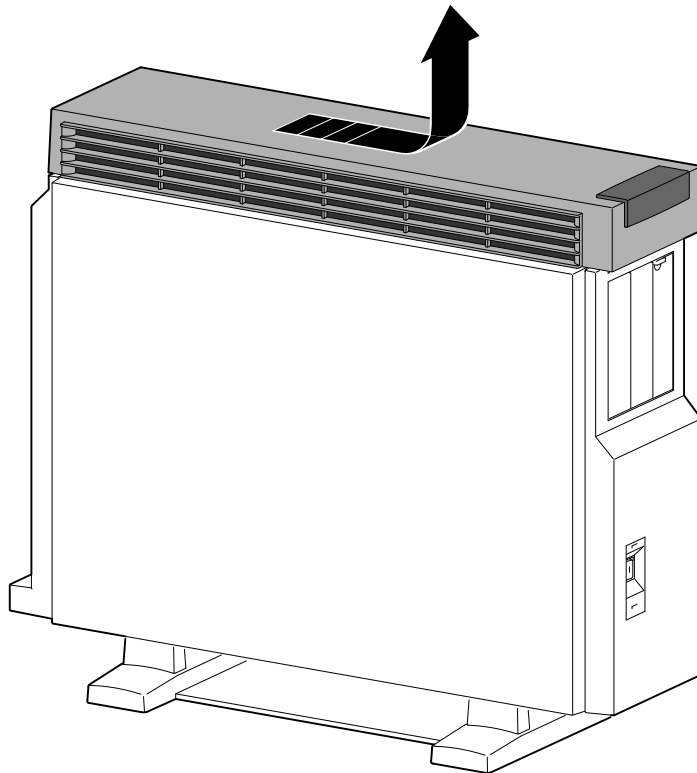


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**Step 2:
Remove Cover**

Remove the system cover by sliding it forward and lifting it off, as shown in Figure 2-7. Note that the cover must be removed before you can remove the front panel or either side panel.

Figure 2-7 Removing the System Cover



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Removing Panels

WARNING: Capacitor Discharge

Allow 15 seconds from the time the system power is turned off until you remove the system's side panels. This delay gives the power supply capacitors time to discharge safely.

CAUTION: Static Damage

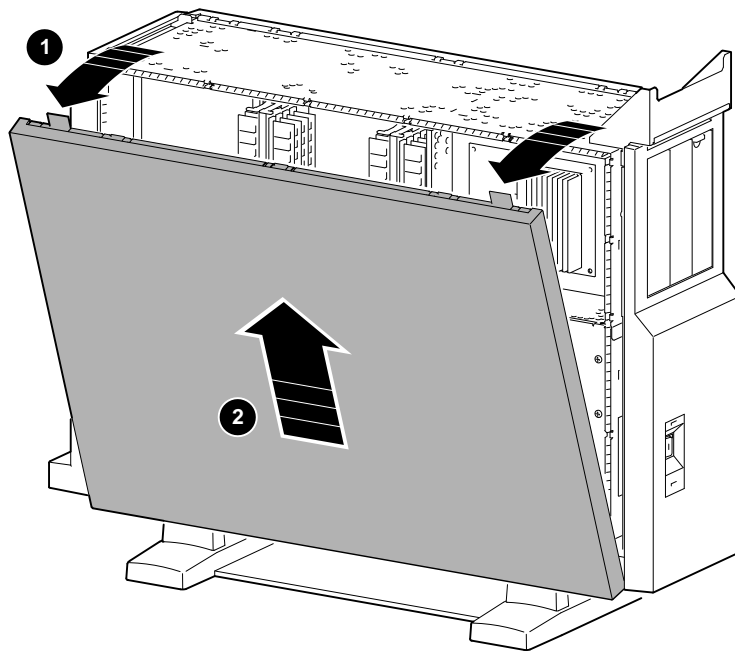
To avoid damage from static discharge after removing the side panels and before touching anything inside the system, wear an antistatic wrist strap. For information on using an antistatic wrist strap, see *Using an Antistatic Wrist Strap* later in this chapter.

Step 3: Remove Left Panel

If adding memory to the system, or if adding TURBOchannel modules to the *left* side of the system unit (slots 0, 1, or 2); remove the left side panel by pulling the tabs on the top edge away ❶ and lifting the bottom edge out of the track ❷, as shown in Figure 2-8. Do *not* pull on the plastic part of the panel. (TURBOchannel options may be installed in either the left or right side.)

Removing Panels

Figure 2-8 Removing the Left Side Panel



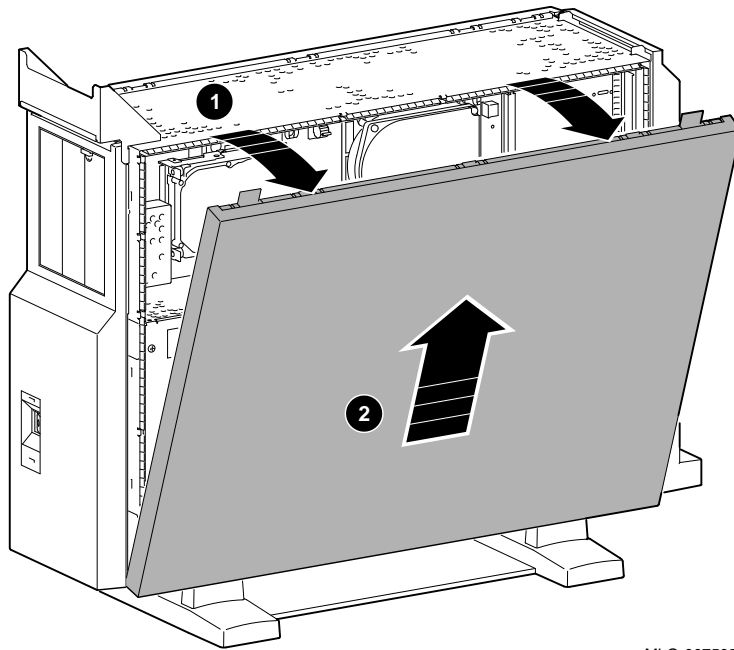
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Removing Panels

Step 4: Remove Right Panel

If adding one or more fixed disk drives or a removable-media drive to the system unit, or if adding TURBOchannel modules to the *right* side of the system unit (slots 3, 4, or 5); remove the right side panel by pulling the tabs on the top edge away ❶ and lifting the bottom edge out of the track ❷, as shown in Figure 2-9. Do *not* pull on the plastic part of the panel. (TURBOchannel options may be installed in either the left or right side.)

Figure 2-9 Removing the Right Side Panel

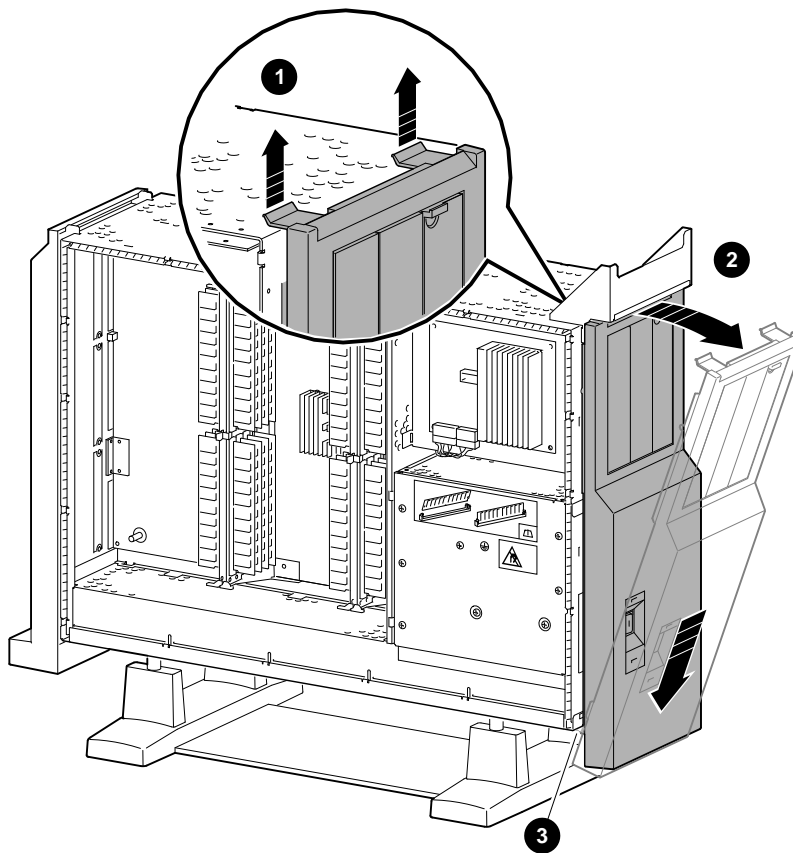


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**Step 5:
Remove Front
Panel**

If adding one or two removable-media drives to the system, remove the front panel by releasing the catches at the top **1**. Pull the panel away **2** and unhook the panel bottom **3**, as shown in Figure 2-10.

Figure 2-10 Removing the Front Panel



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Using an Antistatic Wrist Strap

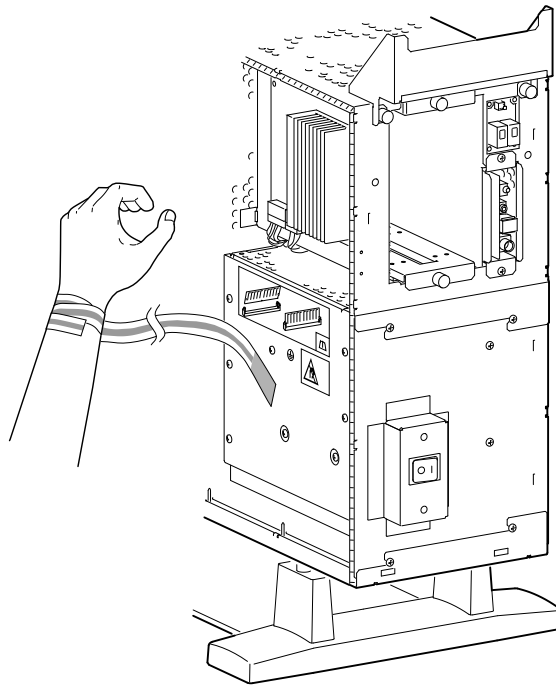
CAUTION:
Component
Damage

To avoid damage to internal components from static discharge, wear an antistatic wrist strap before handling any drive or module, and before touching anything inside the system.

Putting On an
Antistatic Wrist
Strap

To use the wrist strap, follow the instructions on the envelope. Note that the wrist strap may be attached to the metal surface of either side of the power supply, as shown in Figure 2–11.

Figure 2–11 Using the Antistatic Wrist Strap



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Where to Go from Here

To Install a Specific Option

Each of the following chapters covers the installation of one type of option. To add a particular internal option, refer to the chapter indicated in Table 2-1.

Table 2-1 Where to Go

To install a	Refer to
Removable-media drive	Chapter 3
Fixed disk drive	Chapter 4
Memory modules	Chapter 5
TURBOchannel modules	Chapter 6

3

Installing a Removable-Media Drive

IMPORTANT: Read First

Your system must be prepared before you can install this drive. See Chapter 2 to:

- Back up files.
- Shut down the system software.
- Display the `show device` screen to review the SCSI ID addresses for each drive in the system. Refer to the option documentation if you need to set or change a SCSI ID address.
- Shut down the system hardware.
- Remove panels.
- Attach the antistatic wrist strap.

Chapter Overview

This chapter covers the following topics:

- Installing a Removable-Media Drive
- Removing a Removable-Media Drive

Installing a Removable-Media Drive

SCSI ID Setting Before proceeding, make sure the drive you are installing is set to an available SCSI ID address. To set or change the SCSI ID address on the drive you are installing, refer to your drive's owner's guide.

Overview Removable-media drives are installed in a bracket in the front of the system unit. These are the steps involved in preparing to install or replace a removable-media drive:

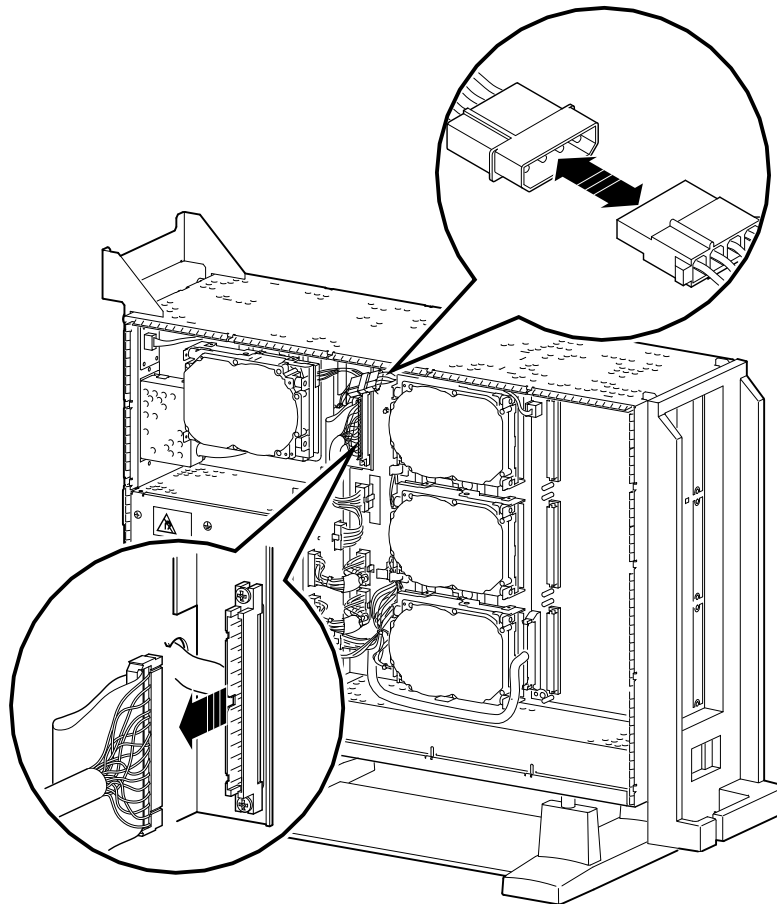
Step	Action
1	Disconnect the power and SCSI cables.
2	Remove the bracket.
3	Identify the power and SCSI cables.
4	Connect the cables to the drive.
5	Place the drive in the bracket.
6	Position the cables.
7	Slide the bracket into the system.
8	Guide the bracket power cable.
9	Connect the cables to the system.
10	Tighten the thumbscrews.
11	Remove the blank filler plate.

The following sections describe these steps.

**Step 1:
Remove Cables
from System**

Disconnect the power and SCSI cables on the right side of the system, as shown in Figure 3-1. The power and SCSI cables for the bracket are shown in Figure 3-3 and Figure 3-4.

Figure 3-1 Disconnecting Power and SCSI Cables



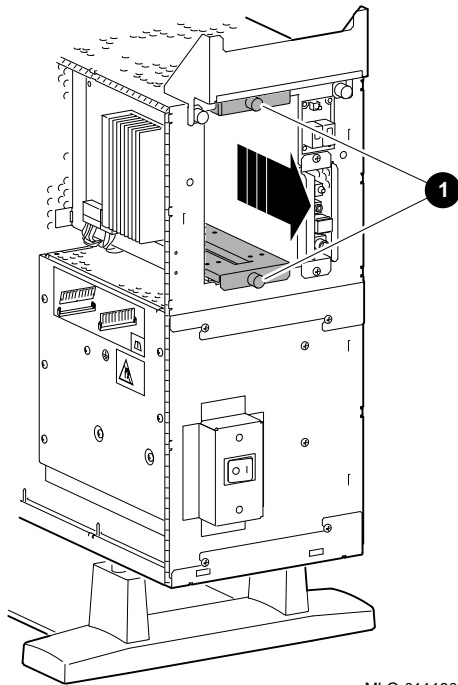
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Installing a Removable-Media Drive

Step 2: Remove Bracket

Remove the drive bracket from the system by releasing the two thumbscrews ❶, as shown in Figure 3–2 and pulling the bracket straight out. The thumbscrews will pop out a little when they are fully loosened. If the thumbscrews are too tight, use a screwdriver to loosen the screws.

Figure 3–2 Removing the Drive Bracket

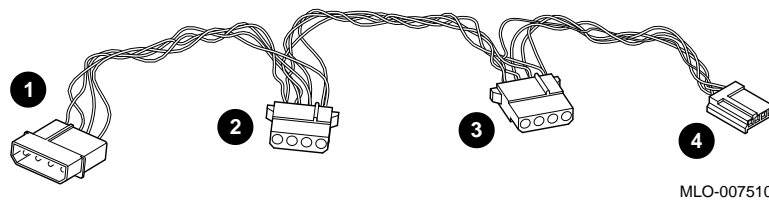


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**Step 3: Identify
Power and
SCSI Cables**

Each cable has several connectors. Refer to Figure 3-3 and Figure 3-4 when making cable connections.

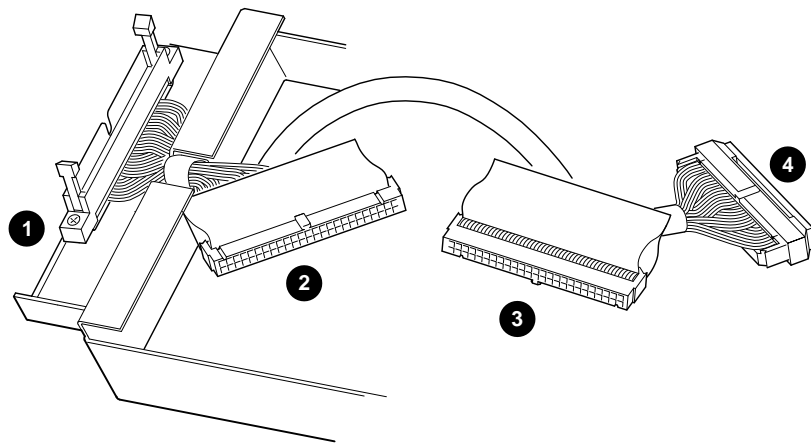
Figure 3-3 Bracket Power Cable Connectors



MLO-007510

- ❶ to system power harness
- ❷ to CD and other removable-media drives in the upper bracket position
- ❸ to removable-media drives in the lower bracket position
- ❹ to the second power connector on a diskette drive only

Figure 3-4 Bracket SCSI Cable Connectors



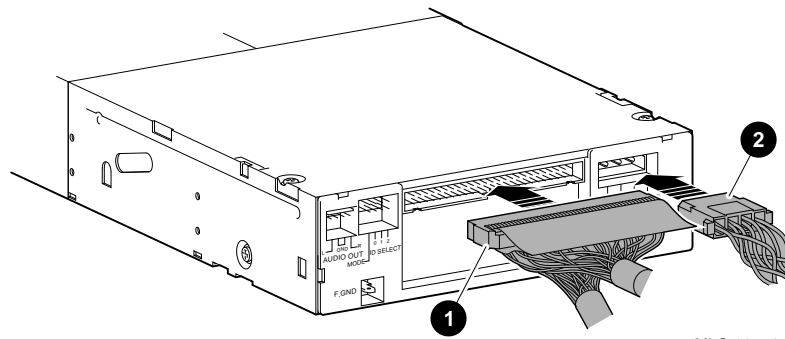
MLO-009887

- ❶ to system SCSI bus
- ❷ to drives in the lower bracket position
- ❸ to drives in the upper bracket position
- ❹ SCSI bus terminator

**Step 4:
Connect Cables
to Drive**

Connect the SCSI **1** and power **2** cables to the ports on the rear of the drive, as shown in Figure 3-5. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive ports.

Figure 3-5 Connecting Cables to a Removable-Media Drive



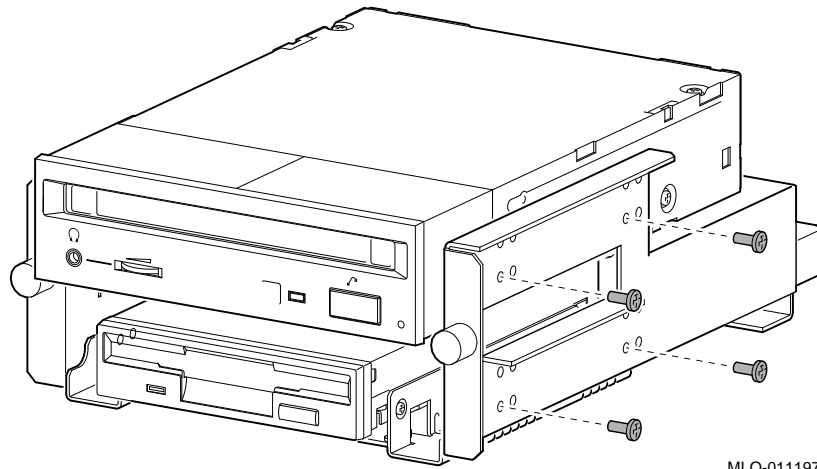
MLO-007515

Installing a Removable-Media Drive

Step 5: Place Drive in Bracket

Place the drive in the bracket, as shown in Figure 3-6, and using the screws that came with the drive, secure it with two screws on each side.

Figure 3-6 Placing the Drive into the Bracket



MLO-011197

Position in Bracket

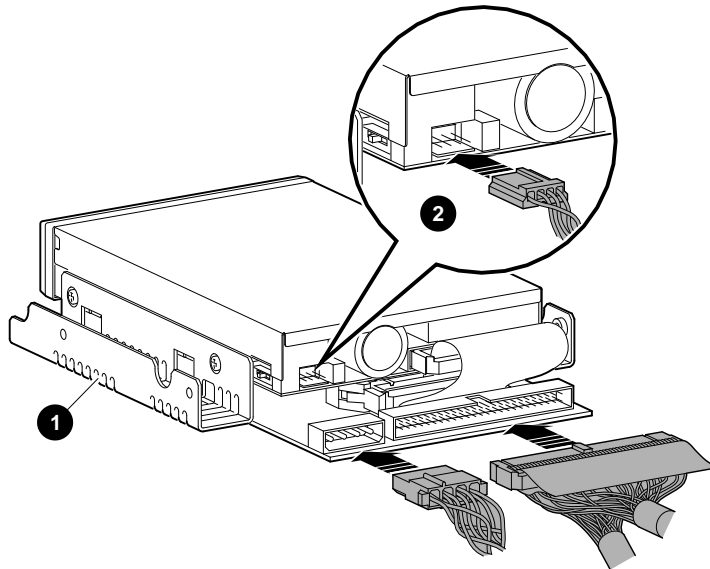
There are two drive positions for the bracket. Mount the CD drive in the upper position, as shown in Figure 3-6, so that it is on the left after the bracket is reinstalled. If a drive other than another CD drive occupies this upper position, move the other drive to the lower position.

Installing a Removable-Media Drive

Diskette Drive

Figure 3-7 shows the extension brackets **1** and second power cable **2** that you attach to the 3.5-inch diskette drive.

Figure 3-7 Diskette Drive Brackets and Cables



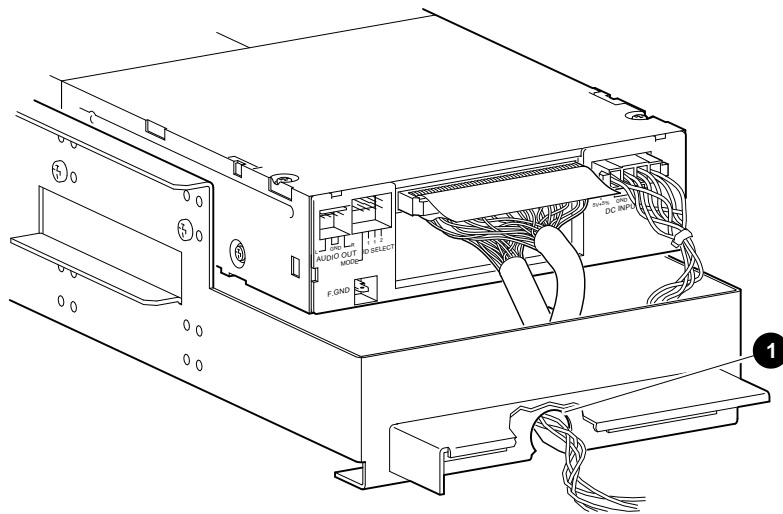
MLO-010993

Installing a Removable-Media Drive

Step 6: Position Cables

Position the power and SCSI cables in the slot ❶ at the rear of the bracket, as shown in Figure 3-8.

Figure 3-8 Positioning the Cables in the Slot



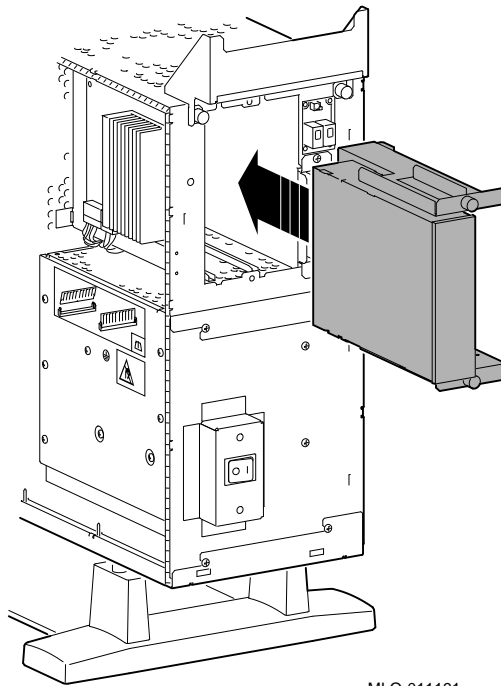
MLO-009392

Installing a Removable-Media Drive

Step 7: Slide Bracket into System

Slide the bracket partly into the system, as shown in Figure 3-9.

Figure 3-9 Sliding the Bracket into the System



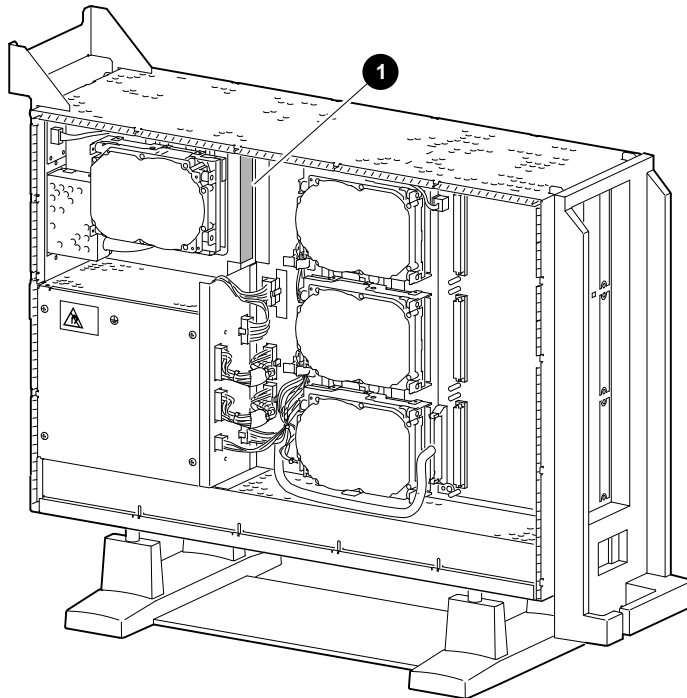
MLO-011191

Installing a Removable-Media Drive

Step 8: Guide Bracket Power Cable

Guide the bracket power cable through the opening **1** into the right side of the system, as shown in Figure 3-10.

Figure 3-10 Bracket Power Cable Opening



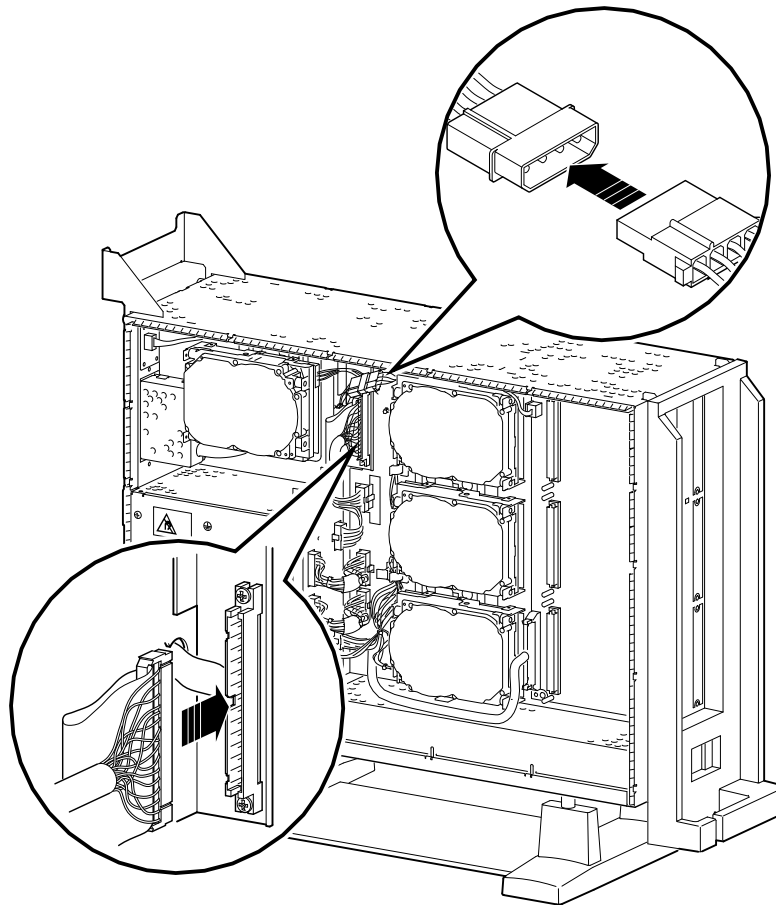
MLO-011264

Installing a Removable-Media Drive

Step 9: Connect Cables to System

Connect the SCSI cable to the SCSI bus connector, and the power cable to the power harness, as shown in Figure 3–11.

Figure 3–11 Connecting Cables to the System



MLO-011265

Step 10: Tighten Thumbscrews

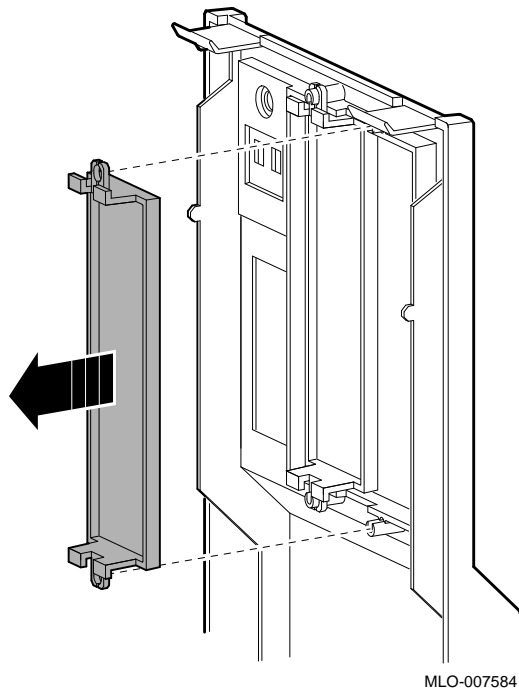
Slide the bracket all the way in, and tighten the two thumbscrews.

Installing a Removable-Media Drive

Step 11: Remove Blank Bezel

Remove the blank bezel from the front panel, as shown in Figure 3-12. Push the bezel out from the sides. Pushing from the middle may break the bezel. This bezel is on the *left* as you face the front of the panel. When installing two drives, remove both blank bezels.

Figure 3-12 Removing the Blank Bezel from the Front Panel



Save the blank bezel in case you ever remove the drive and need to replace the bezel.

Completion

This completes the installation of a removable-media drive.

Removing a Removable-Media Drive

Removal Steps

To take a removable-media drive out of the system unit, follow these steps:

1. Disconnect the SCSI and power cables from the system.
2. Release the two thumbscrews and remove the drive bracket from the system.
3. Disconnect the SCSI and power cables from the drive.
4. Remove the two screws on each side of the drive bracket that secure the drive.
5. Lift the drive out of the bracket.
6. Replace the bracket in the system unit and tighten the two thumbscrews.
7. Reconnect the system SCSI and power cables.
8. Install the filler plate.

Where to Go from Here

If you	Refer to
Have other options to add inside the system,	The appropriate chapter.
Have <i>no</i> other options to add inside the system,	Chapter 7 to replace the panels and check the system.

4

Installing and Removing a Fixed Disk Drive

IMPORTANT: Read First

Your system must be prepared before you can install this drive. See Chapter 2 to:

- Back up files.
- Shut down the system software.
- Display the show device screen to review the SCSI ID addresses for each drive in the system.
- Shut down the system hardware.
- Remove panels.
- Attach the antistatic wrist strap.

Chapter Overview

This chapter covers the following topics:

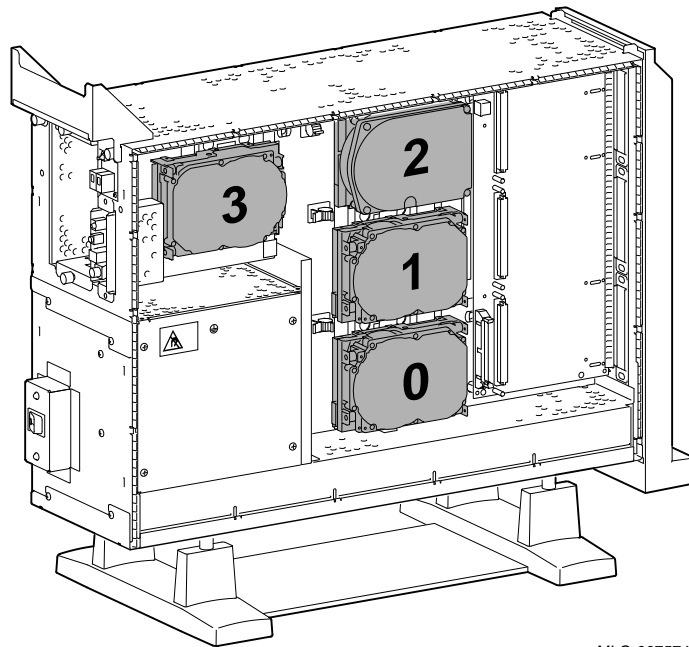
- Installing a Fixed Disk Drive
- Removing a Fixed Disk Drive

Installing a Fixed Disk Drive

SCSI ID Setting Before proceeding, make sure the drive you are installing is set to an available SCSI ID address. To set or change the SCSI ID address on the drive you are installing, refer to the option documentation.

Overview Up to four fixed disk drives can be installed in any of the four drive positions shown in Figure 4-1. The numbers refer to the preferred SCSI addresses for given drive positions.

Figure 4-1 Fixed Disk Drive Positions

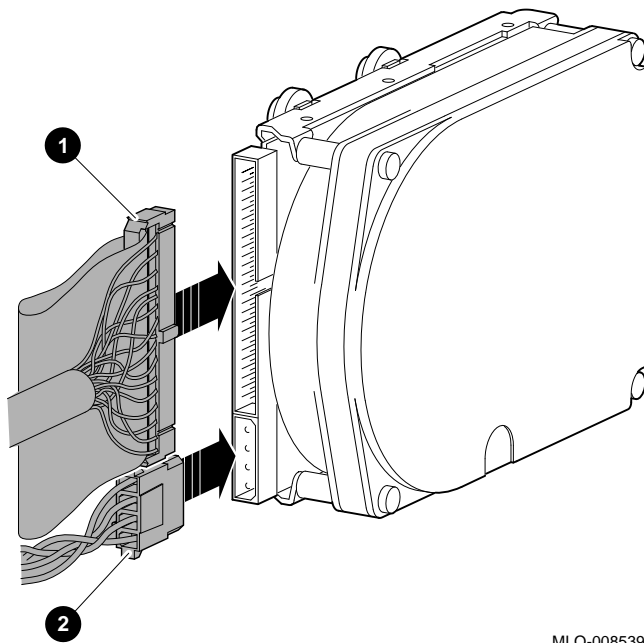


MLO-007574

**Step 1:
Connect Cables**

Connect the SCSI **1** and power **2** connectors to the fixed disk drive, as shown in Figure 4-2. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive.

Figure 4-2 Connecting Fixed Disk Drive SCSI and Power Cables



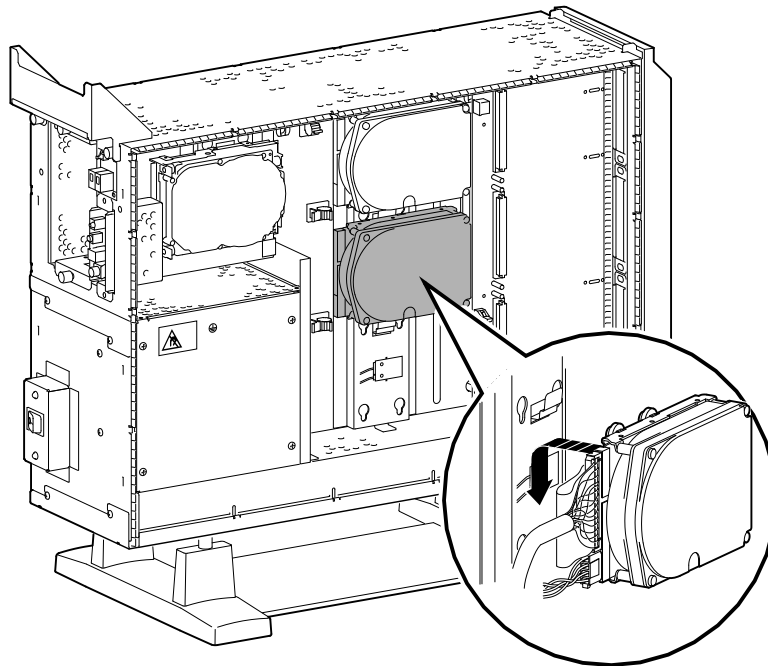
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Installing a Fixed Disk Drive

Step 2: Attach Drive to System

Orient the drive as shown in Figure 4-3, insert the bumpers on the bottom of the drive into the holes in the mounting position, and slide the drive towards the latch, until the latch engages.

Figure 4-3 Installing a Fixed Disk Drive



MLO-008538

Completion

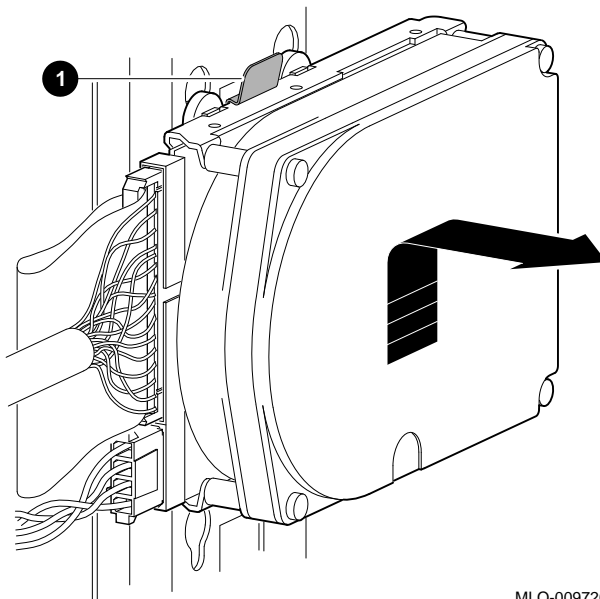
This completes installation of a fixed disk drive.

Removing a Fixed Disk Drive

Remove Drive from System Unit

To remove a fixed disk drive, press the release latch **1** at the top of the drive, as shown in Figure 4-4, and slide the drive up and away from the system unit.

Figure 4-4 Removing a Fixed Disk Drive



MLO-009720

Disconnect Cables

Remove the power and SCSI cables from the drive.

Removing a Fixed Disk Drive

Where to Go from Here

If you	Refer to
Have other options to add inside the system,	The appropriate chapter.
Have <i>no</i> other options to add inside the system,	Chapter 7 to restore and check the system.

5

Memory Modules

IMPORTANT: Read First

Your system must be prepared before you can install memory modules. See Chapter 2 to:

- Back up files.
- Shut down the system software.
- Display the `show memory` screen to review the memory configuration already installed.
- Shut down the system hardware.
- Remove the system panels.
- Attach the antistatic wrist strap.

Chapter Overview

This chapter covers the following topics:

- Determining What Modules You Need
- Memory from Other Systems
- Configuration Table
- Installing Memory Modules
- Removing Memory Modules

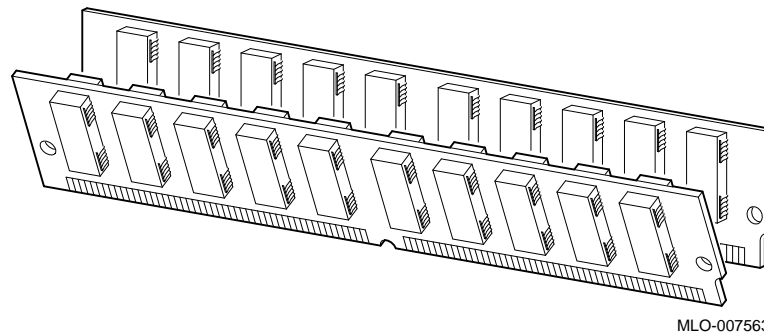
Determining What Modules You Need

Memory Module Sizes

Memory modules are available in 4-megabyte, 8-megabyte, 16-megabyte, and 32-megabyte sizes. 4-megabyte and 16 megabyte modules have components on one side. 8-megabyte and 32-megabyte modules have components on both sides (front and back).

Figure 5-1 shows the memory modules.

Figure 5-1 Memory Modules



System Memory

To increase the system's memory capacity, you can order memory upgrades. For a particular memory configuration, see Table 5-1.

The system can hold a maximum of 1 gigabyte of memory (32 32-megabyte memory modules).

Configuration Table

Table 5-1 provides an example of which modules need to be installed for a given total amount of memory.

Table 5–1 Memory Configurations

Desired Memory	Modules to Add
32 MB	Eight 4-MB modules
64 MB	Eight 8-MB modules
64 MB	Sixteen 4-MB modules
96 MB	Eight 4-MB and Eight 8-MB modules
96 MB	Twenty-four 4-MB modules
128 MB	Eight 16-MB modules
128 MB	Sixteen 8-MB modules
160 MB	Eight 4-MB and Sixteen 8-MB modules
192 MB	Sixteen 4-MB and Sixteen 8-MB modules
192 MB	Twenty-four 8-MB modules
256 MB	Eight 32-MB modules
256 MB	Sixteen 16-MB modules
384 MB	Twenty-four 16-MB modules
512 MB	Sixteen 32-MB modules
512 MB	Thirty-two 16-MB modules
768 MB	Twenty-four 32-MB modules
1 GB	Thirty-two 32-MB modules

Note that modules are installed in sets of eight (two modules on each of four memory mother boards (MMBs), as shown in Figure 5–2).

Memory from Other Systems

Do not attempt to use memory modules from any other system in the system. Other modules are not necessarily compatible with this system.

Before Installing

CAUTION: **Memory Module** **Damage**

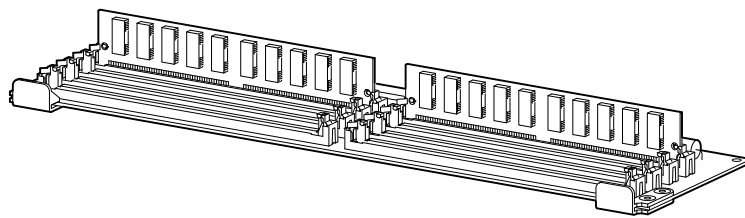
To avoid damage from static discharge after removing the left side panel and before opening the shipping bag for any memory module, and before touching anything inside the system, wear an antistatic wrist strap. See *Using an Antistatic Wrist Strap* in Chapter 2 for more information.

Handle memory modules by their edges to avoid damaging and contaminating the module pins and connectors.

Memory Mother **Boards (MMBs)**

Memory modules are installed onto four memory mother boards (MMBs), which are installed into the system. Figure 5–2 shows an MMB with two memory modules installed on it.

Figure 5–2 Memory Mother Board (MMB)



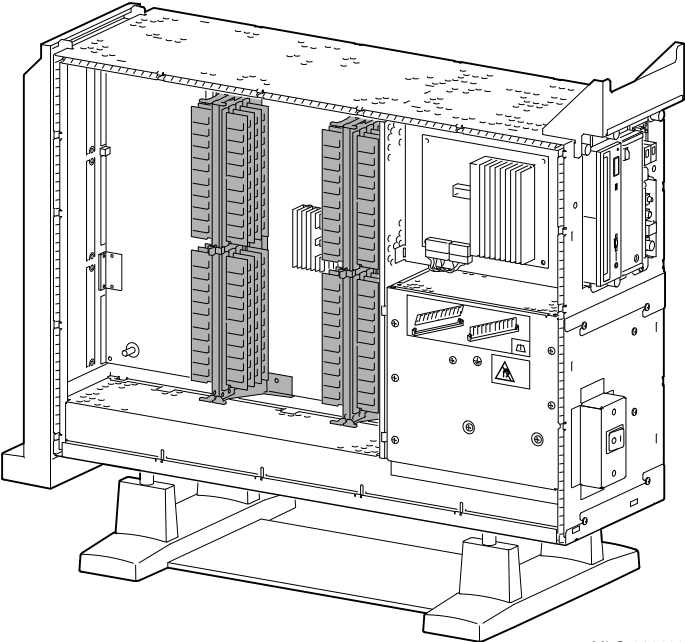
MLO-007564

Before Installing

Where to Install

Figure 5-3 shows the location of MMBs with memory modules inside the system.

Figure 5-3 Location of MMBs and Memory Modules



MLO-011192

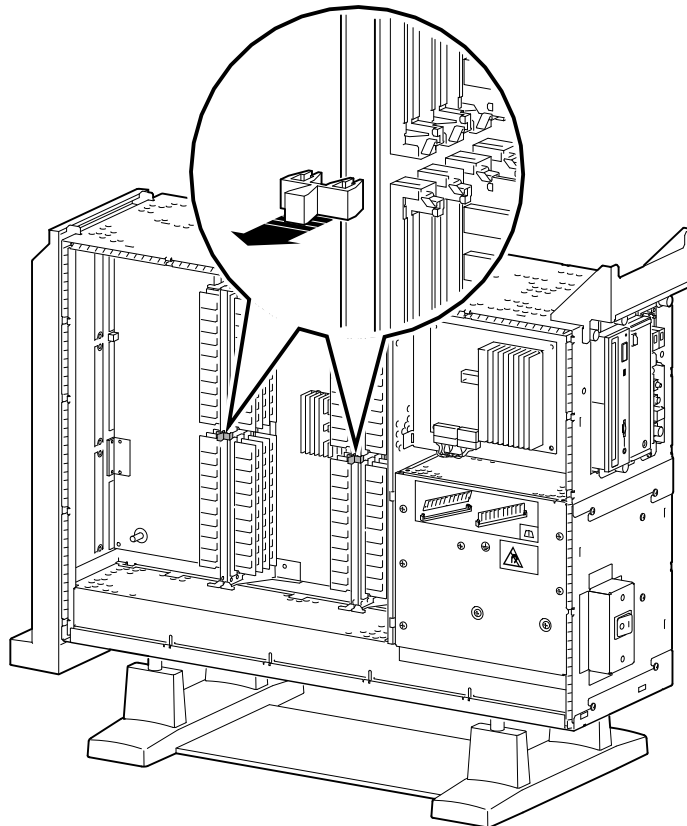
Installing Memory Modules

To install memory modules in the system, follow these steps:

Step 1:
Remove the
MMB Clips

Remove the two clips from the MMBs, as shown in Figure 5–4.

Figure 5–4 Removing MMB Clips



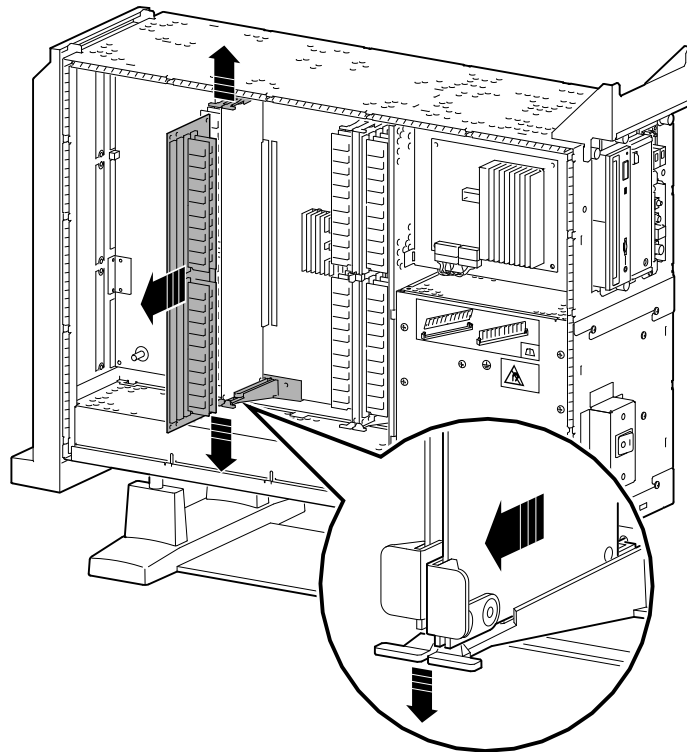
MLO-011193

Installing Memory Modules

Step 2: Remove the MMBs

Remove all four MMBs from their channels by releasing the catches and sliding the boards out, as shown in Figure 5-5.

Figure 5-5 Removing an MMB



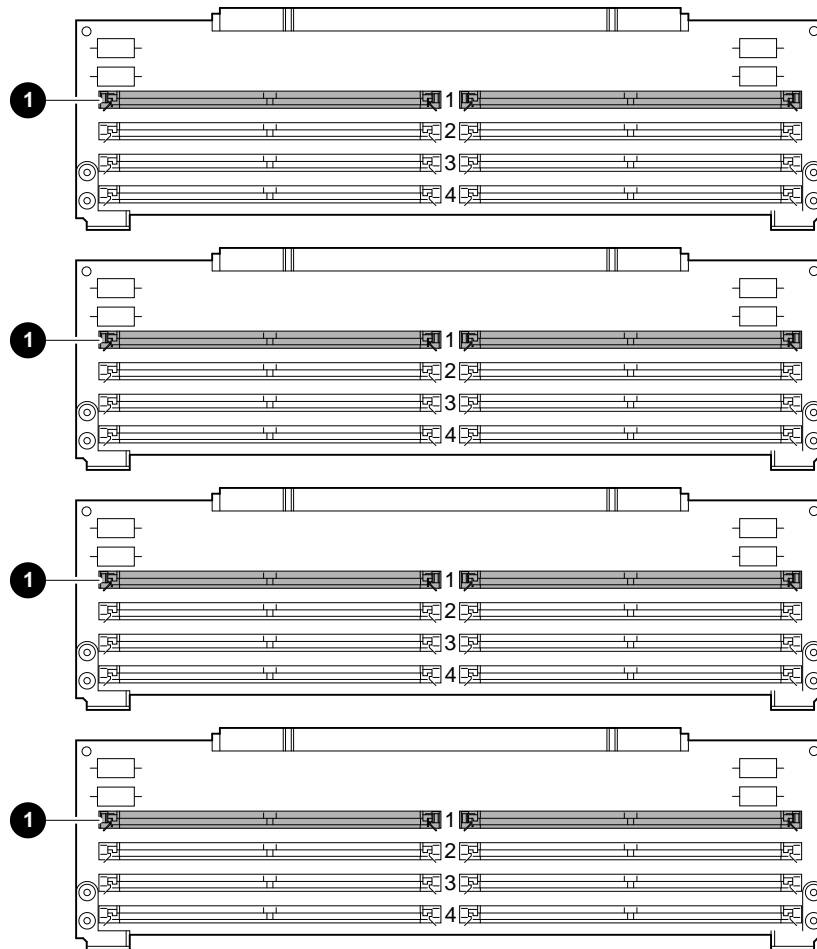
MLO-011194

Installing Memory Modules

Step 3: Place the MMBs on Protected Surface

Place the four MMBs, with the connectors up, on a flat surface that is protected from electrostatic discharge (such as the top of the system or an antistatic mat), as shown in Figure 5-6.

Figure 5-6 Placing the MMBs



MLO-009721

Guidelines for Installing

The following guidelines should be used when installing memory modules:

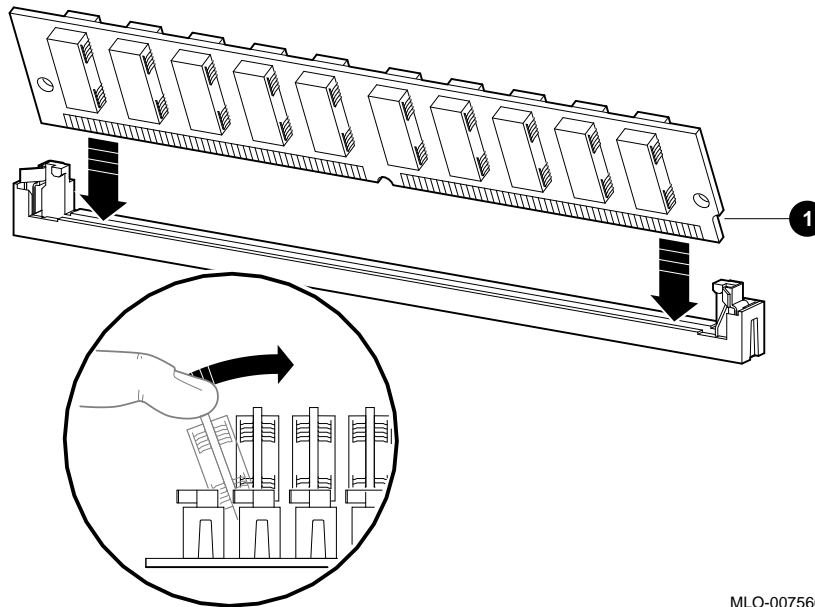
- Modules must be added in sets of eight, adding two modules to each of the four MMBs.
- Add modules starting at the empty MMB slots with the lowest numbers. Add two modules to the corresponding slots ❶ on each MMB, as shown by the shaded areas in Figure 5-6.
- Use the same size (MB) modules for a set of eight slots. For example, you might add a set of eight 4-MB modules or a set of eight 8-MB modules, but do not mix 4- and 8-MB modules within a set. If you do mix different sizes of memory modules within a set, your system will not recognize some of the memory.

Installing Memory Modules

Step 4: Install Modules in MMB

Install the memory modules in the MMBs, using the previous guidelines. Hold the module at an angle, with the notch end **1** as shown in Figure 5-7, and place it in the slot. *Make sure that the board is firmly seated in the connector, but do not force it.* Push the board upright so that it stands vertically. You should hear a distinctive click on each side when the module is secured by the metal clips.

Figure 5-7 Installing a Memory Module



MLO-007566

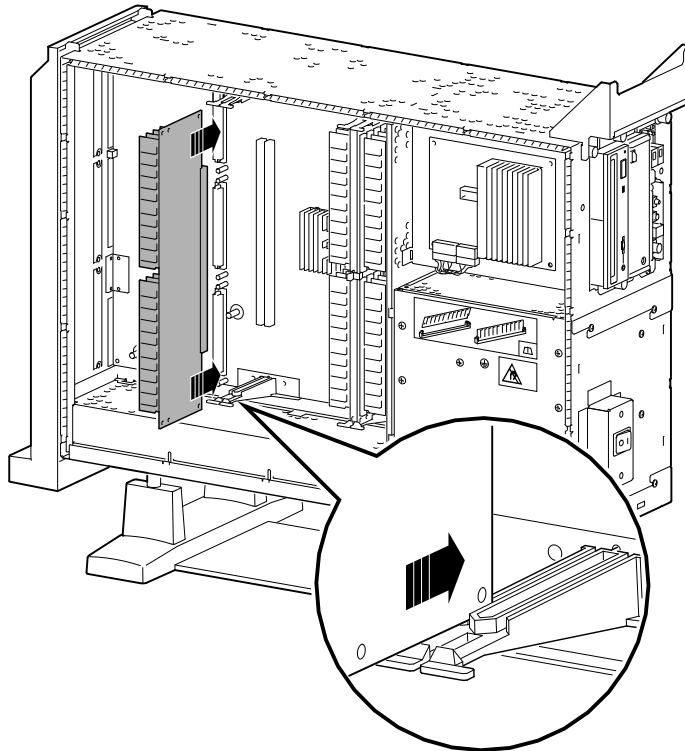
Working from the lower numbered slots to the higher numbered slots, continue adding modules in empty slots of the MMBs until the system contains the desired amount of memory.

Installing Memory Modules

Step 5: Install MMBs

Install the MMBs into the card guides in the side of the system, as shown in Figure 5–8. Make sure that the MMBs are firmly seated in their connectors, but do not force them.

Figure 5–8 Installing an MMB



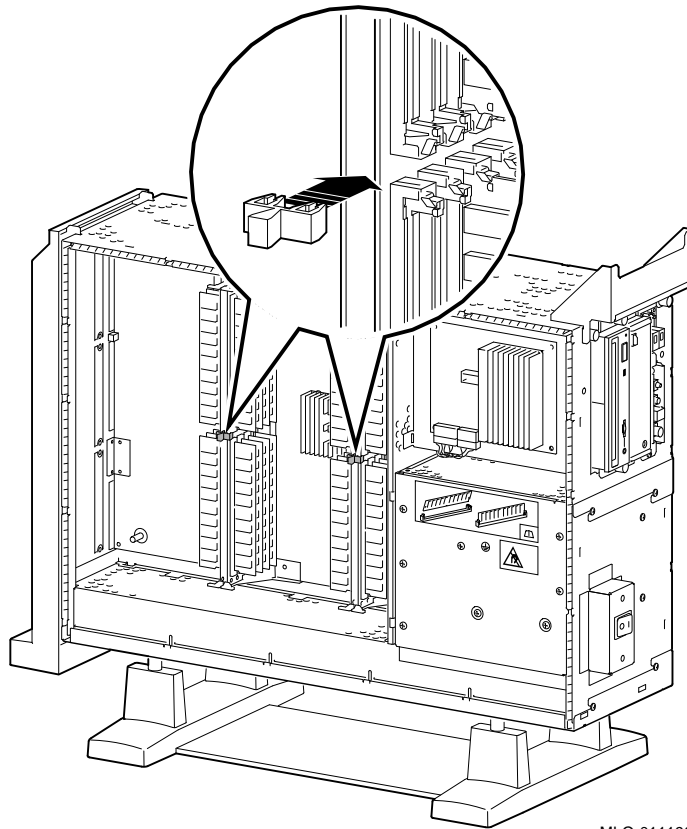
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Installing Memory Modules

Step 6: Install the MMB Clips

Install the two clips on the MMBs, as shown in Figure 5–9.

Figure 5–9 Installing MMB Clips



MLO-011196

Completion

This completes installation of the memory modules.

Removing Memory Modules

You may need to remove memory modules at some time, such as when replacing them with higher capacity modules. To remove modules, see the following steps.

**IMPORTANT:
System Needs**

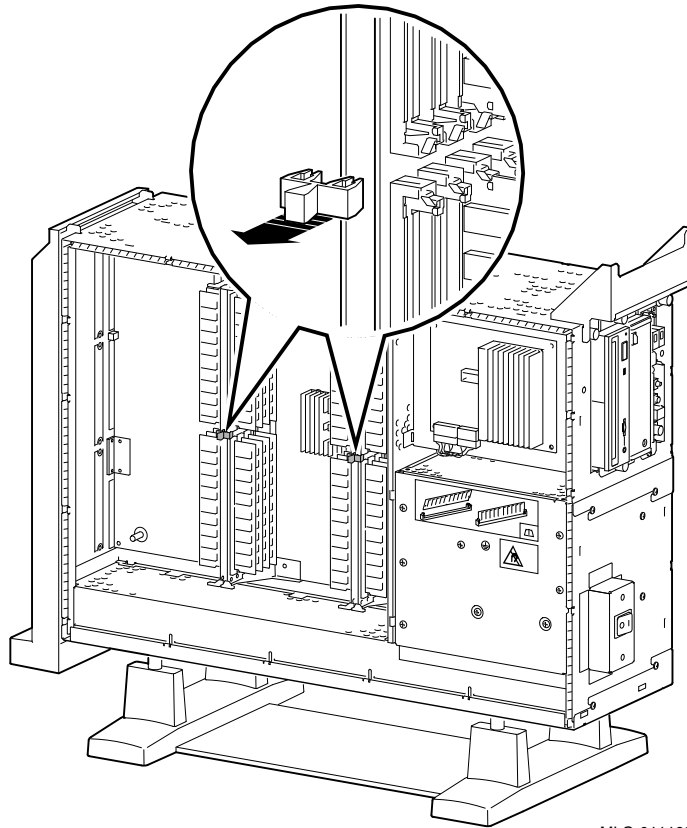
Note that the system will *not* operate if no memory modules are installed. You must have at least one set of eight memory modules.

Removing Memory Modules

Step 1: Remove the MMB Clips

Remove the two clips from the MMBs, as shown in Figure 5-10.

Figure 5-10 Removing MMB Clips



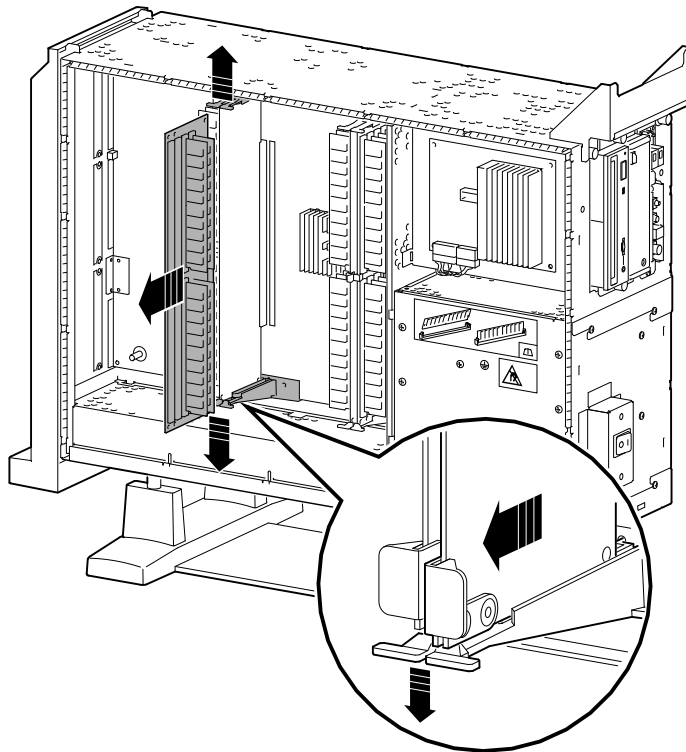
MLO-011193

Removing Memory Modules

Step 2: Remove MMBs

Remove all four MMBs from their channels by releasing the catches and sliding the boards out, as shown in Figure 5–11.

Figure 5–11 Removing an MMB



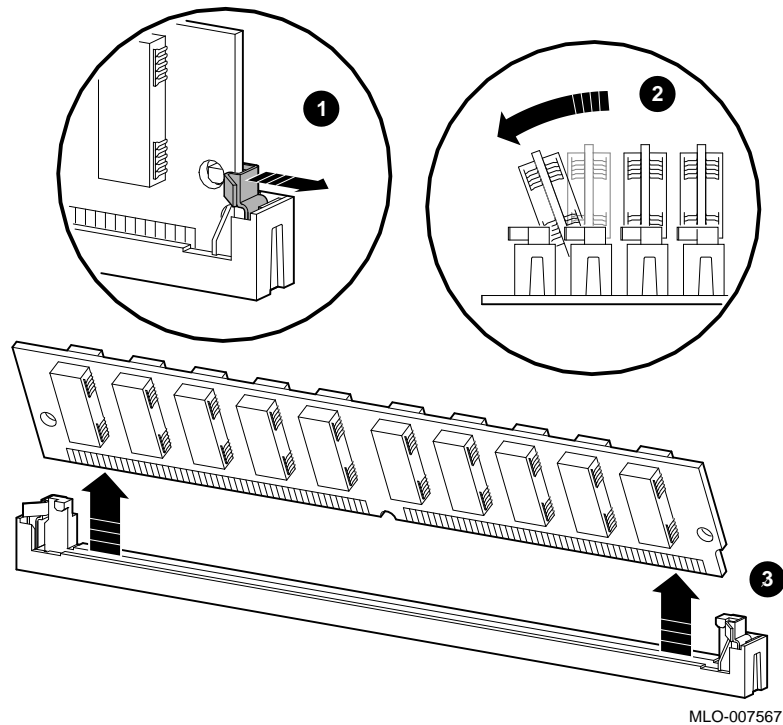
MLO-011194

Removing Memory Modules

Step 3: Remove Memory Modules

To remove modules, start at the MMB slots with the highest numbers, and work toward the slots with the lowest numbers. Remove the memory modules from the MMBs by releasing the metal clips at each end of the module **1**, tilting the module **2**, and lifting it out **3**, as shown in Figure 5–12. Remove modules in sets of eight, removing both modules from corresponding slots on each of the four MMBs.

Figure 5–12 Removing a Memory Module

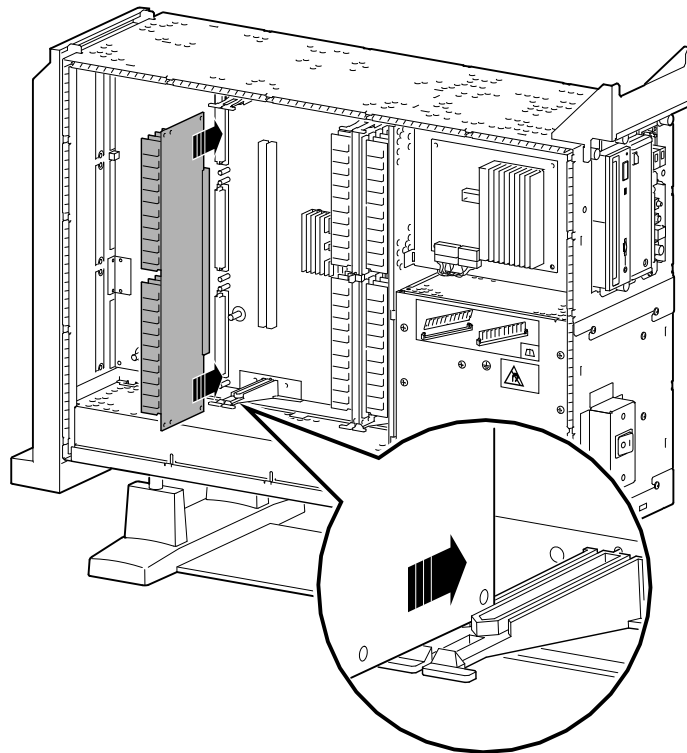


Removing Memory Modules

Step 4: Replace MMBs

Place the MMBs back into the card guides in the side of the system, as shown in Figure 5–13. Make sure that the MMBs are firmly seated in their connectors, but do not force them.

Figure 5–13 Installing an MMB



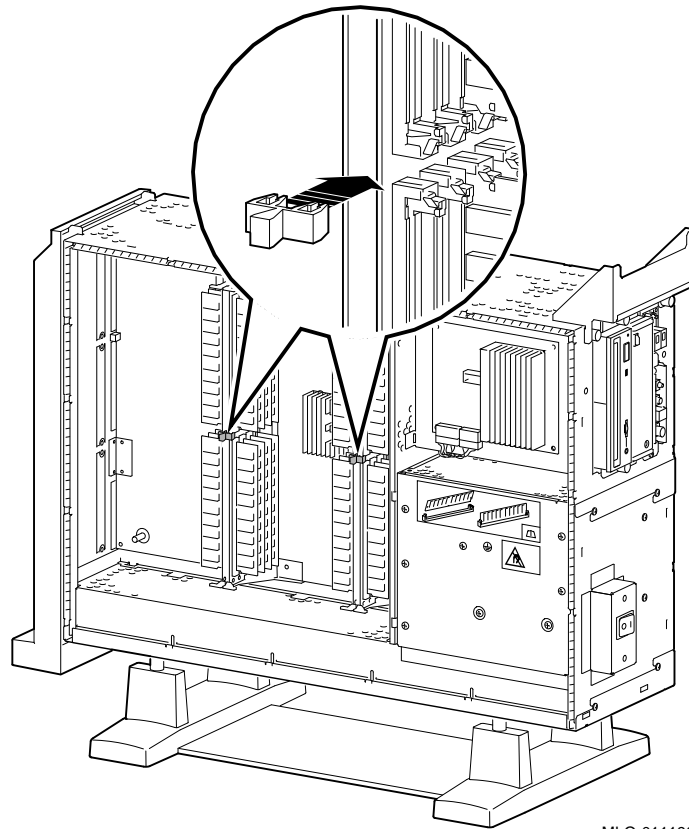
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Removing Memory Modules

Step 5: Install the MMB Clips

Install the two clips on the MMBs, as shown in Figure 5–14.

Figure 5–14 Installing MMB Clips



MLO-011196

Where to Go from Here

If you	Refer to
Have other options to add inside the system,	The appropriate chapter.
Have <i>no</i> other options to add inside the system,	Chapter 7 to replace the panels and check the system.

6

TURBOchannel Options

IMPORTANT: Read First

Your system must be prepared before you can install TURBOchannel modules. See Chapter 2 to:

- Back up files
- Shut down the system software
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

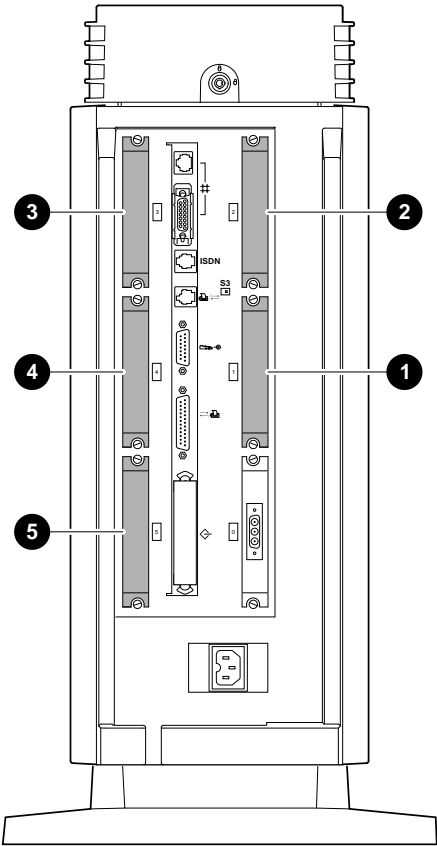
Chapter Overview

This chapter covers descriptions, installation, and removal of TURBOchannel options.

TURBOchannel Overview

What It Is	TURBOchannel is a high-performance module interconnect technology that permits the use of graphics, multimedia, and communications options. Refer to your Software Product Descriptions (SPD) for available options.
Third-Party Options	Although this chapter covers TURBOchannel option modules manufactured by Digital, other companies have developed modules that may be compatible with the system. Consult your Digital sales representative for more information.
System TURBOchannel Slots	<p>The system unit has six TURBOchannel option module slots: three on the system module (left side of the system), and three on the I/O module (right side of the system).</p> <p>Note that, since Figure 6-1 shows the rear of the system, the left side of the system is on the right side of the figure (slots 0, 1, and 2), and the right side of the system is on the left side of the figure (slots 3, 4, and 5).</p>

Figure 6-1 TURBOchannel Option Slots

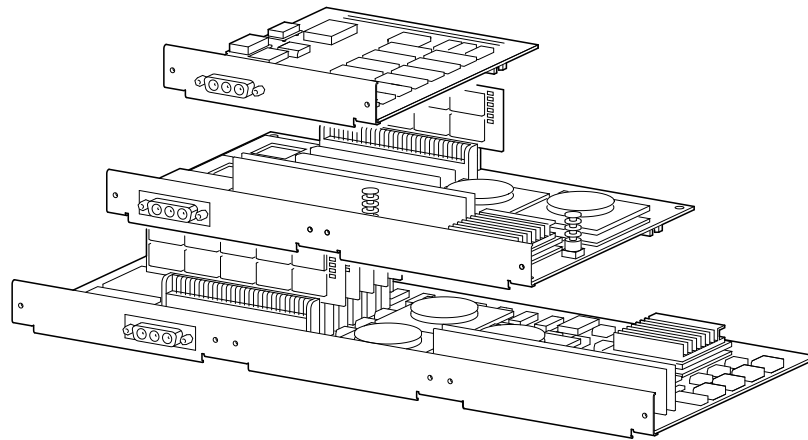


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TURBOchannel Options

The TURBOchannel option modules have different widths, each occupying 1, 2, or 3 slots, as shown in Figure 6-2.

Figure 6-2 TURBOchannel Option Widths



MLO-011276

Compatibility of Graphics Modules

Some of the TURBOchannel modules provide graphics enhancements, but not all graphics modules are compatible with all monitors. Before upgrading the graphics module, you should consider the monitor requirements. Consult your Digital sales representative and your monitor documentation for more information.

Installation

Choosing a TURBOchannel Slot

The TURBOchannel modules plug directly into either the system module (3 slots) or the I/O module (3 slots). See Figure 6–1.

If you are installing options, you should consider the widths of the modules you plan to use, as well as where future options would be placed.

Installation Procedure

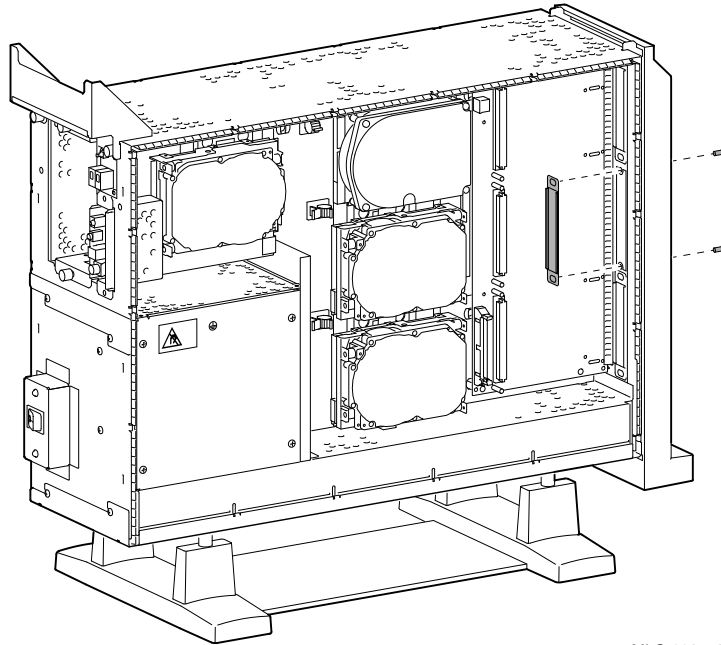
To install a TURBOchannel module, follow these steps:

1. Wear an antistatic wrist strap whenever you handle a module or work inside the system box. See Using An Antistatic Wrist Strap in Chapter 2.
2. Choose one or more unused TURBOchannel slots, as needed, considering the locations and sizes of existing modules. You may find that one or more existing modules need to be moved to make space for a new module software configuration when changing module slots.

Installation

3. Remove the two screws and metal filler plate at the chosen slot or slots, as shown in Figure 6-3. Save the plate, in case you remove a module later. Save the screws for attaching the new module to the system cabinet.

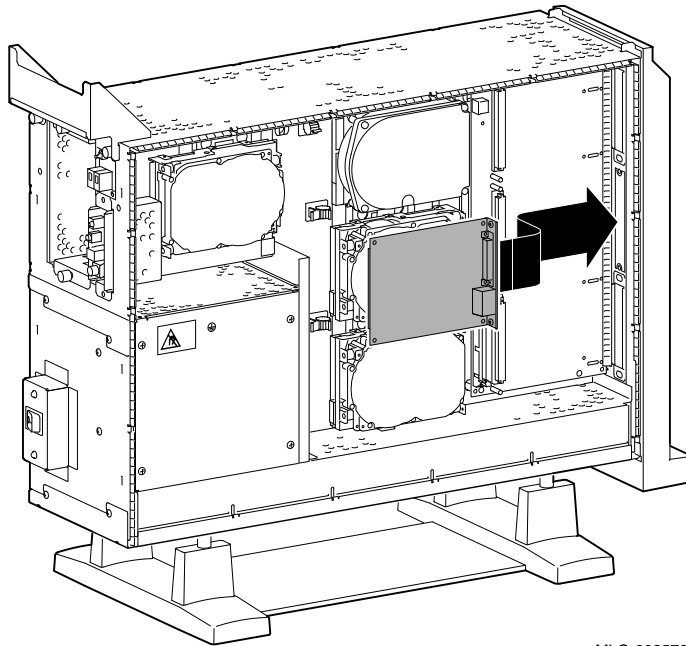
Figure 6-3 Removing a Metal Filler Plate



MLO-008578

4. Orient the new module as shown, inserting the module port through the slot, as shown in Figure 6-4.

Figure 6-4 Seating a TURBOchannel Module



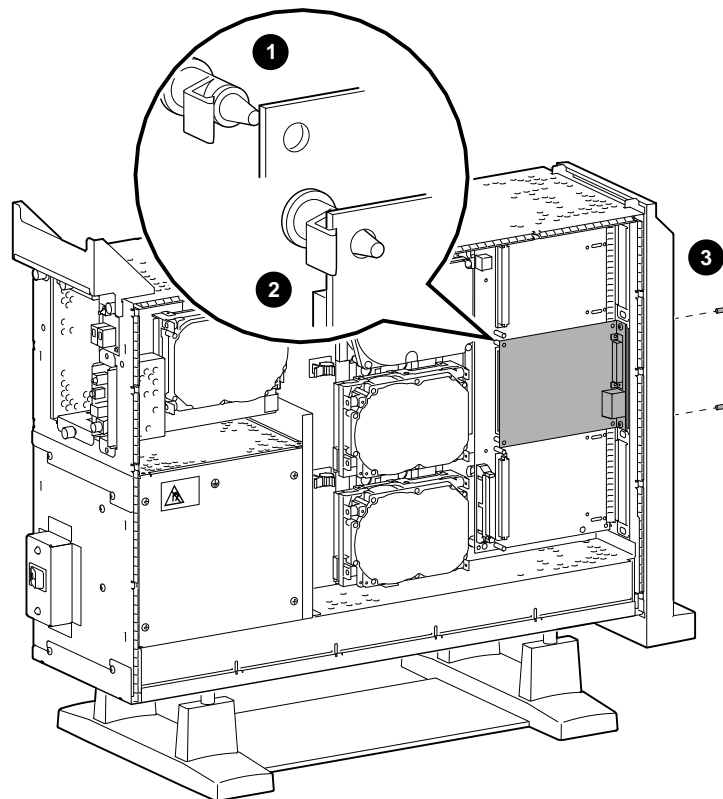
MLO-008579

Installation

5. Press the corners of the module over each mounting post **1**, seating the module connector with the connector on the system module or I/O module, as shown in Figure 6-5. When the module is seated, the pin latches **2** will hold the module in place. Secure the module, using two screws for every slot **3**.

Be sure to reconnect any pigtail connectors that were secured by the screws. (For more information on pigtail connectors, refer to the appendixes of the owner's guide.)

Figure 6-5 Securing a TURBOchannel Module



MLO-008580

Completion

This completes installation of a TURBOchannel module.

Removing a TURBOchannel Module

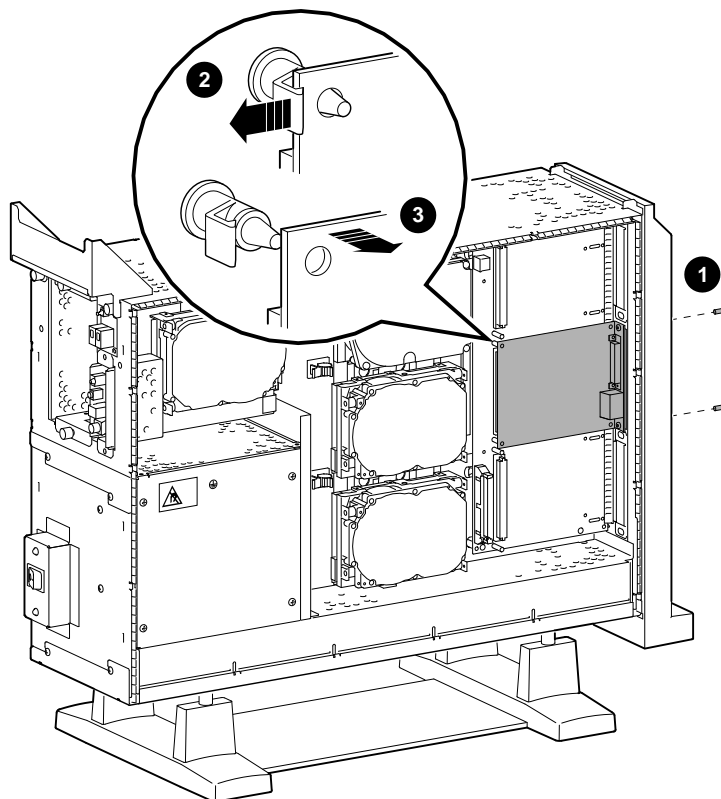
To remove a TURBOchannel module, follow these steps:

1. Refer to Chapter 2 to prepare your system.
2. Wear an antistatic wrist strap whenever you handle a module or work inside the system box. See Using An Antistatic Wrist Strap in Chapter 2.
3. Remove any cables that are attached to the module that is being removed.
4. Remove the slot screws that hold the module in place. See ❶ in Figure 6-6.

Removing a TURBOchannel Module

5. Release the latches **2** that hold the edge of the module in place, and carefully pull **3** the module connector away from the connector on the system module or I/O module, as shown in Figure 6-6. If you are removing a 3-slot module, you may need assistance to release the six latches simultaneously and pull the module away from the system module or I/O module.

Figure 6-6 Removing a Module



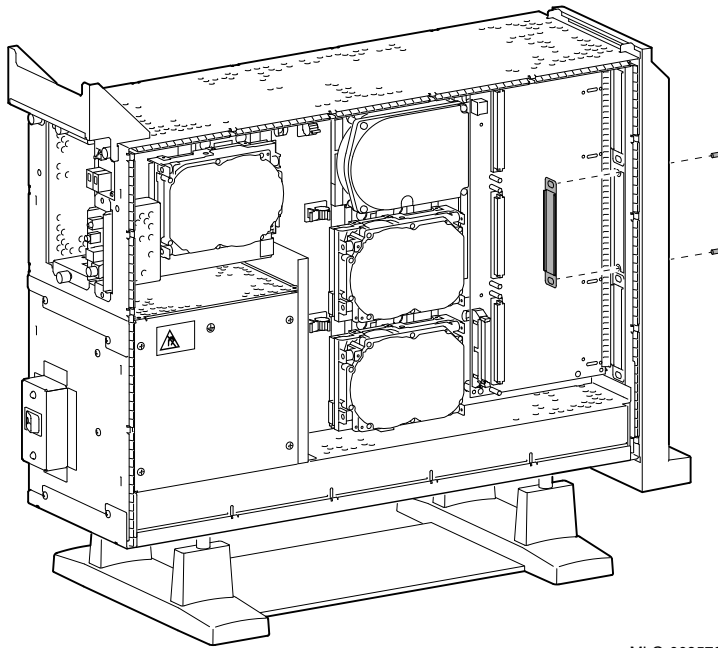
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6. Remove the module from the system box.

Removing a TURBOchannel Module

7. Replace the slot plates for all emptied slots, attaching the plates with two screws.

Figure 6-7 Replacing a Slot Plate



MLO-008578

Completion

This completes removal of a TURBOchannel module.

Where to Go from Here

If you	Refer to
Want to connect cables to a newly-installed module,	Your option documentation.
Have other options to add inside the system,	The appropriate chapter.
Have <i>no</i> other options to add inside the system,	Chapter 7 to replace panels and check the system.

7

Restoring the System

Chapter Overview

This chapter covers the following topics:

- Storing the Wrist Strap
- Replacing Panels
- Restarting and Testing the System

Storing the Wrist Strap

Refold and store the wrist strap for future use, following these steps:

1. Remove the copper strip end of the strap from the power supply. Replace the paper covering on the sticky surface.
2. Unwrap the strap from your wrist.
3. Fold the strap, starting at the copper strip end. Use the folds in the strap as a guide.
4. Place the strap in the envelope and store it in a safe place.

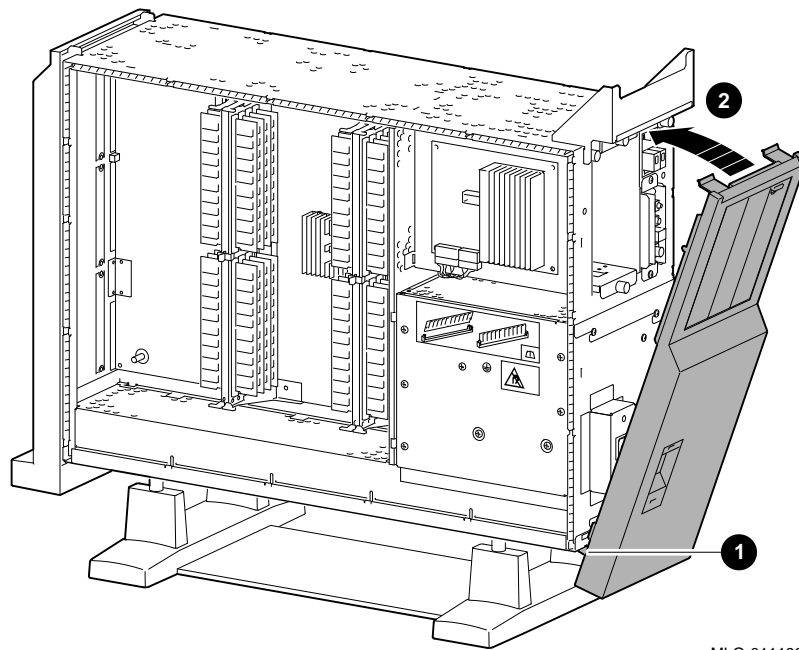
Replacing Panels

To replace the panels, follow these steps, as needed:

Step 1: Replace Front Panel

To replace the front panel, hook the bottom of the panel **1** under the system, and push the top in until the latches **2** engage, as shown in Figure 7-1.

Figure 7-1 Replacing the Front Panel



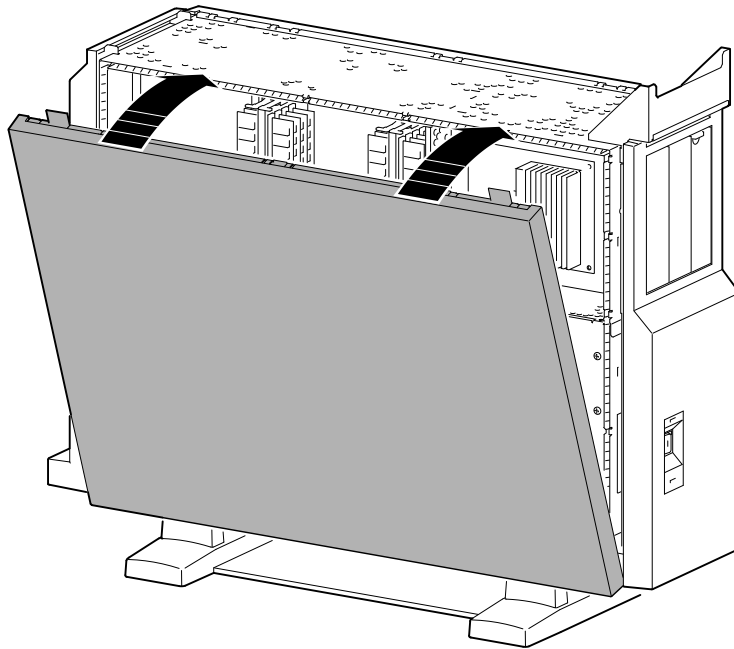
MLO-011199

Replacing Panels

Step 2: Replace Left Panel

To replace the left side panel, seat the bottom edge of the panel in the track, push down to set the panel, and press the top of the panel in, as shown in Figure 7-2.

Figure 7-2 Replacing the Left Side Panel



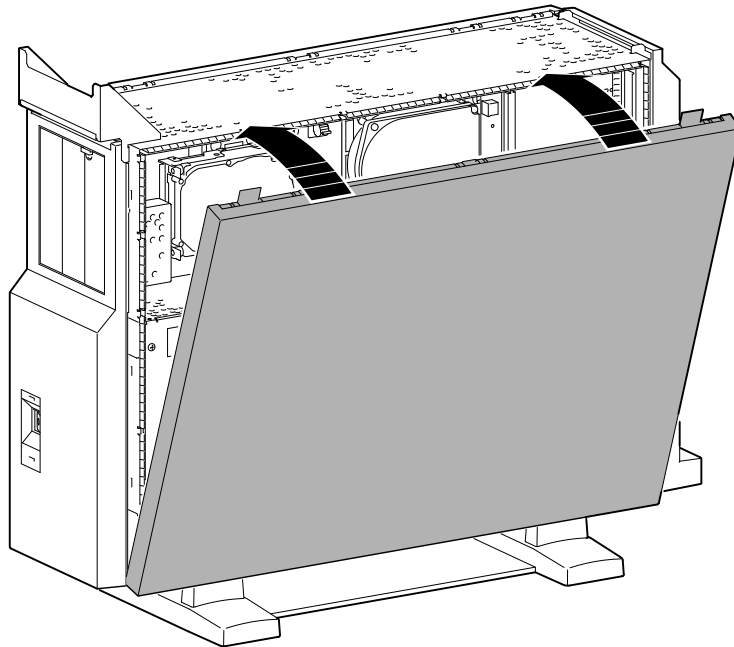
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Replacing Panels

Step 3: Replace Right Panel

To replace the right side panel, seat the bottom edge of the panel in the track, push down to set the panel, and press the top of the panel in, as shown in Figure 7-3.

Figure 7-3 Replacing the Right Side Panel

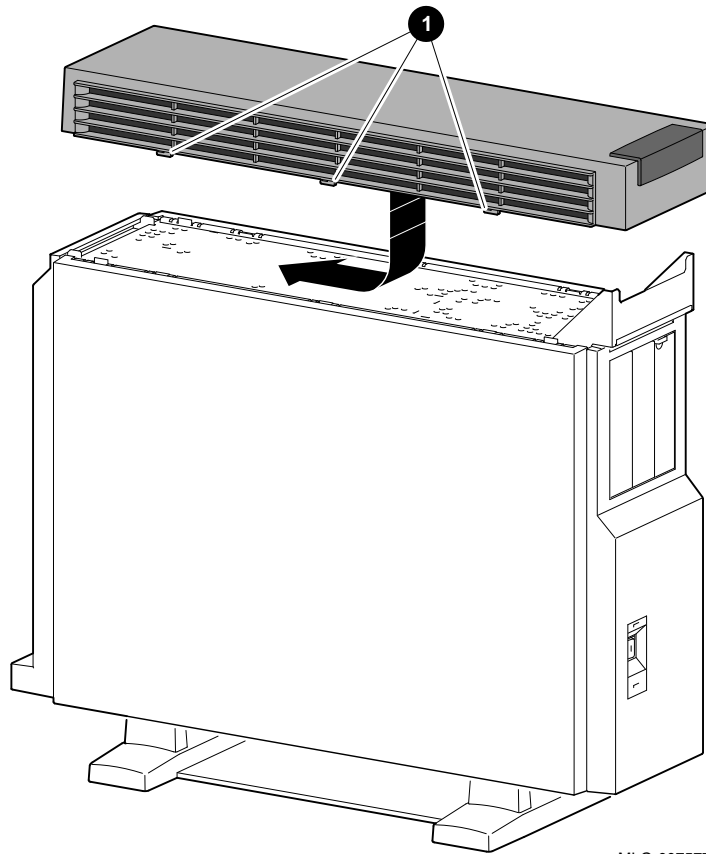


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Step 4: Replace System Cover

Replace the system cover by seating it on the top of the system and sliding it toward the rear, as shown in Figure 7-4. Make sure that the hooks **1** face the rear, and that the lock on the cover is toward the rear of the system.

Figure 7-4 Replacing the System Cover



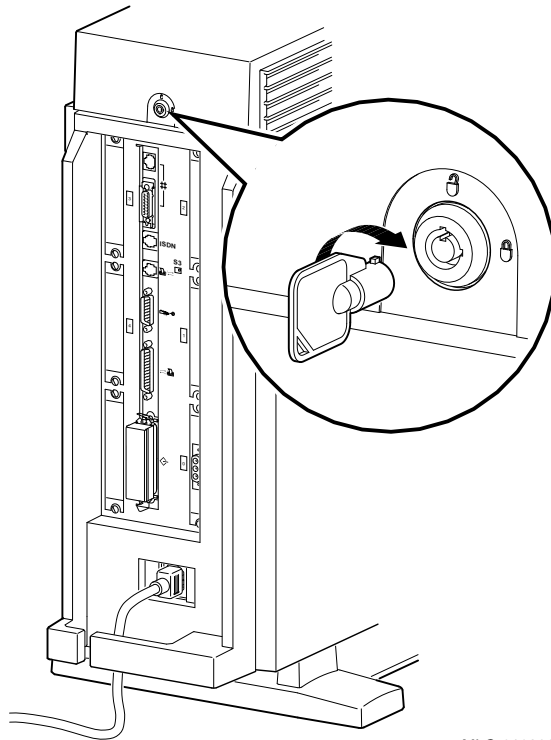
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Replacing Panels

Step 5: Lock Cover

Lock the system cover, as shown in Figure 7-5.

Figure 7-5 Locking the System Cover



MLO-010890

Restarting and Testing the System

Reconnect Cables

Reconnect all the cables that were removed during the option installation.

Turning On

To start the system, turn on (|) the equipment in the following order:

1. Monitor
2. Expansion boxes, printers, and modems
3. System

Note that although expansion boxes, printers and modems can be turned on at any time, turning them on as listed here will ensure that they are configured when the system is turned on.

Console Prompt

When you turn it on, the system should give a display similar to the `show config` display, then stop at the console prompt. (If the system does not stop at the console prompt, it has been set to boot automatically. Press the halt button to get the console prompt.)

Recording Startup Messages

Write down any startup error messages. Refer to the *DEC 3000 Model 800/800S/900 AXP Owner's Guide* for an explanation of common error messages and for more information about testing the system.

Restarting and Testing the System

Testing Drive Installation

To make sure that the drives are connected correctly, enter the `show device` command as explained in Chapter 2. Compare the latest configuration display with the display shown when preparing the system before adding a drive. You should see the new drive and all the drives that were present before the addition.

If a new drive was installed, but is not in the current display, it has not been installed properly.

Make sure that drives are set to the correct SCSI addresses.

Make sure that no error messages appear. Two question marks in the `show device` display indicate an error with a drive. If any error messages appear, write them down.

If a drive does not display, two or more drives may have been installed with the same SCSI address, and you will need to change them to ensure that each drive has a unique address.

Testing Memory Installation

To make sure that the memory modules and MMBs are connected correctly, display the system configuration by using the `show memory` command as explained in Chapter 2. Compare the latest memory configuration with the display shown when preparing the system before adding any memory modules. You should see the current system memory. If the memory figure is incorrect, one or more memory modules have not been installed properly.

Testing TURBOchannel Module Installation

To make sure that the TURBOchannel modules are connected correctly, display the system configuration by using the `show config` command as explained in Chapter 2. Compare the latest configuration display (TCINFO and DEVNAM columns) with the display shown when preparing the system before adding a module. You should see the new module and all the modules that were present before the addition.

If a new module was installed, but is not in the current display, it has not been installed properly.

Restarting and Testing the System

If You Have Problems

If the displays show an error, follow these steps, using the wrist strap:

1. Shut down the system hardware.
2. Make sure that all cables inside and outside the system are properly reconnected.
3. Make sure that all modules are fully seated in their connectors.
4. Make sure SCSI address switches and jumpers are set correctly; no two drives should be set to the same SCSI address.

If problems persist, refer to the troubleshooting section of your *DEC 3000 Model 800/800S/900 AXP Owner's Guide*, or contact your Digital service representative.

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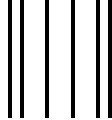
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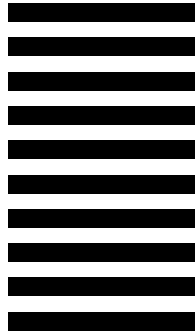
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