DEC 3000 Model 600/600S/700 AXP

Options Guide

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Preface

About This Guide

This guide is intended for all users of the DEC 3000 Model 600/600S/700 AXP system unit. It describes how to install and remove the following options:

- Removable-media drives
- Fixed disk drives
- Memory modules
- TURBOchannel option modules

Information for Each Option

This guide provides the following information for each internal option:

- How to install and remove options
- How to test for successful installation

This guide also briefly describes the external options.

Two Methods of Adding Options

There are two methods of adding options inside your system:

- Add the options yourself.
- Have a Digital service representative add them.

If you choose to add the options, note that installations typically take about 15 minutes for each option, although some procedures may take more or less time.

What You Should Know Beforehand

The instructions in this guide assume that you are accustomed to opening the system unit, disconnecting and connecting internal cables, and using antistatic precautions. You should also understand the following diagnostic test displays and concepts:

- System test messages
- Displays resulting from the `show config`, `show dev`, and `show mem` console commands
- SCSI switch and jumper settings

  (If you are not familiar with SCSI concepts, refer to *Small Computer System Interface: An Overview*.)

CAUTION: Possible Module Damage

Improper installation of an optional drive or module could lead to damage and failure of that option. Your system warranty may not cover such a failure.

IMPORTANT: Software Product Descriptions

The Software Product Description (SPD) is the official defining document for software products licensed by Digital Equipment Corporation, including third-party products licensed by Digital. An SPD describes all important functional characteristics of the software. The terms and conditions under which the corporation sells and licenses its software products identify SPDs as the documents that specify Digital's obligation under software warranty.

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.

Organization

This guide is organized into 7 chapters and an index.

Chapter	Title	Brief Description
1	Internal Options for Your System	Identification and location of internal options.
2	Preparing Your System for Internal Options	Preparation of your system before adding internal options.
3	Installing a Removable-Media Drive	Installation and removal procedures.
4	Installing a Fixed Disk Drive	Installation and removal procedures.
5	Memory Modules	Description of memory modules and installation and removal procedures.
6	TURBOchannel Options	Description of TURBOchannel modules and installation and removal procedures.
7	Restoring the System	Restoration and testing of your system after internal options are added.

Conventions in This Guide

The following conventions are used in this guide:

Convention	Description
Return	A key name is shown enclosed to indicate that you press the named key on the keyboard.
DEC OSF/1 operating system	This name refers to the DEC OSF/1 AXP operating system
OpenVMS operating system	This name refers to the OpenVMS AXP operating system

Convention	Description
`show`	A word in this typeface indicates a command that you must enter from the keyboard at the console prompt (>>>) exactly as shown, for example: `show config`.
WARNING:	Warnings contain information to prevent personal injury. Read these carefully.
CAUTION:	Cautions provide information to prevent damage to equipment or software. Read these carefully.

1

Internal Options for Your System

Chapter Overview

Introduction

Both internal and external options are available for your system. Internal options, such as fixed disk and removable-media drives, memory modules, and TURBOchannel option modules, are added inside the system unit. External options, such as a console terminal, printers, modems, and pointing devices are connected externally to the system unit by cable.

In This Chapter

This chapter identifies the following internal options and shows where they are positioned in the system unit:

- Removable-media drives
- Fixed disk drives
- Memory modules
- TURBOchannel option modules

Supported Drives and Modules

Your system supports the following options:

- One 3.5-inch removable-media drive: one diskette or tape drive, both with a mounting plate, *or* one 5.25-inch removable-media drive: one compact disc or tape drive
- Up to two half-height fixed disk drives
- Memory modules
- Up to three TURBOchannel option modules (one module slot is for the graphics option)

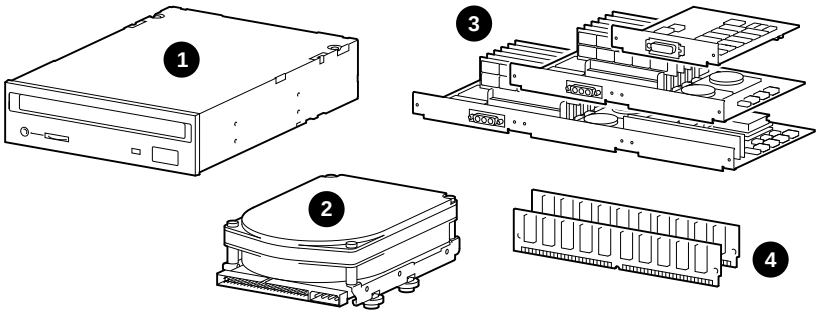
Refer to the *Digital Systems and Options Catalog* and the Software Product Descriptions (SPD) for the current list of options supported on this system.

Internal Options and Their Positions in the System Unit

Identification of Options

Figure 1–1 shows optional drives, the memory modules, and the TURBOchannel modules. Figures 1–2 and 1–3 show where the drives, memory modules, and TURBOchannel modules are installed in the system unit.

Figure 1–1 Internal Options You Can Add



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❶ Removable-media drive

❷ Fixed disk drive

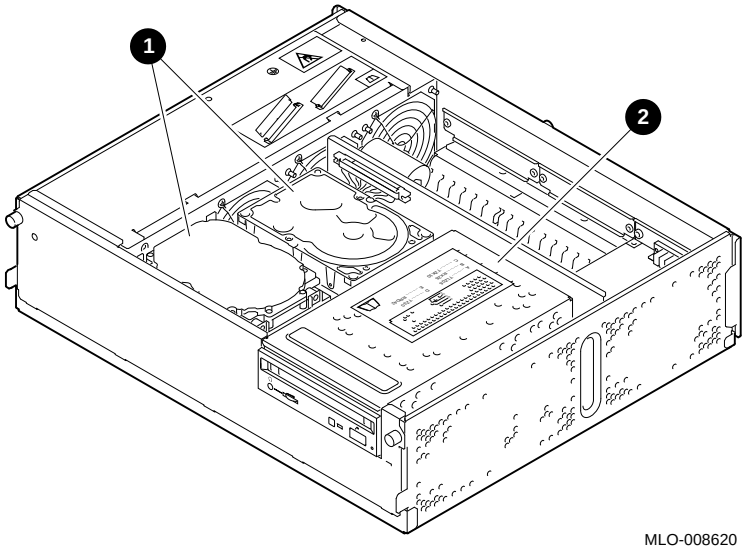
❸ TURBOchannel option modules

❹ Memory modules

Removable-Media and Fixed Disk Drives

Figure 1–2 shows where to install the fixed disk drives ❶ and the removable-media drive bracket ❷.

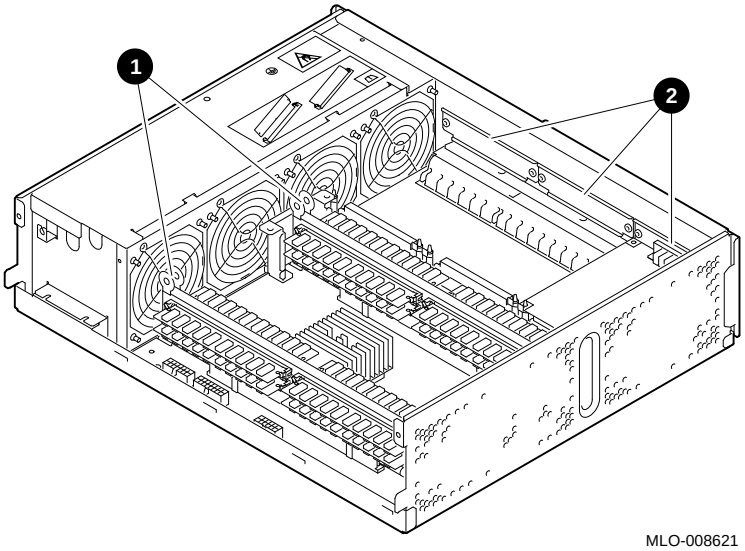
Figure 1–2 Position of Fixed Disk and Removable-Media Drives



Memory and TURBOchannel Modules

As shown in Figure 1–3, memory modules are installed under the drive plate ❶, and TURBOchannel modules are installed behind the drive plate ❷.

Figure 1–3 Position of Memory Modules and TURBOchannel Modules



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2

Preparing Your System for Internal Options

Chapter Overview

IMPORTANT: Read First

Refer to this chapter before you install any of the options described in this guide.

In This Chapter

This chapter covers the following preparation tasks:

- Backing Up Files and Shutting Down Software
- Displaying the System Configuration
- Shutting Down the Hardware
- Removing the System Unit Cover
- Using the Antistatic Wrist Strap

CAUTION: Damage Improper installation of an option could lead to damage or failure of that module, and your warranty may not cover that damage.

Backing Up Files and Shutting Down Software

Back Up Your Files Before you begin system preparation tasks, be sure to back up files stored on a fixed disk, removable-media device, or both by following the instructions in your software documentation.

Shut Down Networked Systems You must shut down your software before displaying the system configuration. Procedures for shutting down your software vary depending on whether and how your system is networked.

If you are	See your
Networked, or part of a cluster	System manager
Not networked, nor part of a cluster	Software documentation
Not sure if you are part of a network	System manager

Displaying the System Configuration

Diagnostic Test Displays

Before you install any options, you should be familiar with the system and the following diagnostic displays:

- System startup messages
- The display resulting from the `show device`, `show config`, and `show memory` console commands

The `show` commands are described in the sections that follow:

Task Overview

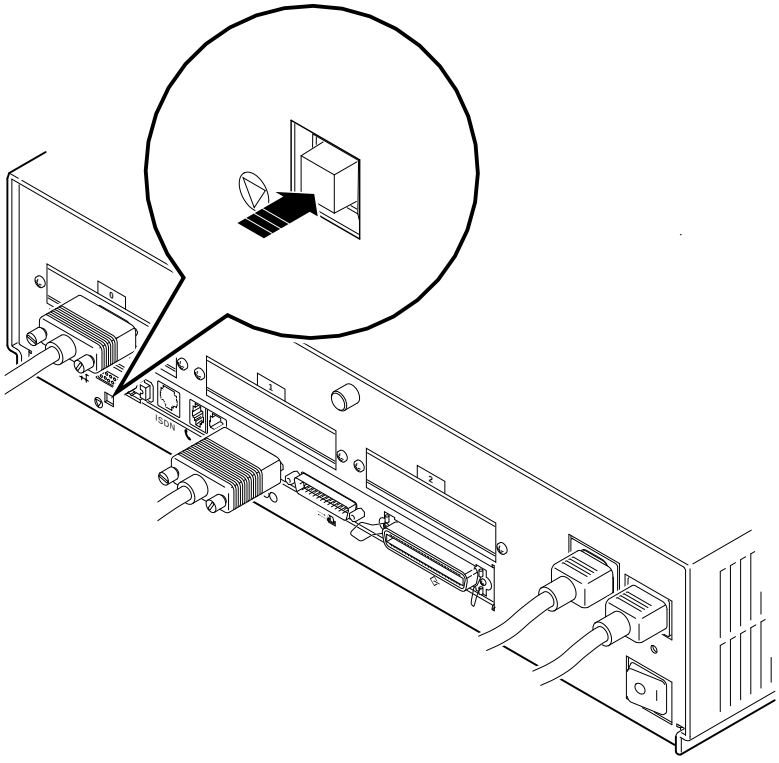
These are the steps involved in displaying the system configuration:

Step	Action
1	Press the halt button on the back of the system unit to get to console mode (>>>).
2	Type the `show device` command at the console prompt (>>>) to display the names and status of drives.
3	Type the `show config` command at the console prompt (>>>) to display the status of the TURBOchannel options.
4	Type the `show memory` command at the console prompt (>>>) to display the amount of memory installed in the system.

Step 1: Press the Halt Button

Put your system into console mode to display the console prompt (>>>) by pressing the halt button on the back of your system unit, as shown in Figure 2–1.

Figure 2–1 Halt Button



Step 2: Enter the show dev Command

Enter the show device command as follows:

```
>>> show device Return
```

The show device command displays the status of each drive that is recognized by the system. Record the displayed information for later reference. After adding or replacing a drive, you can compare the new system configuration with the previous one to verify that all drives were installed correctly. If an installed drive is not listed in the display, it is not installed correctly.

Example: show device Display

Figure 2–2 shows an example of a show device display (the black callout numbers are for reference only). Table 2–1 describes the columns of the show device display.

Figure 2–2 show device Display

```
❶          ❷          ❸          ❹          ❺     ❻    ❼       ❽
BOOTDEV    ADDR       DEVTYPE    NUMBYTES   RM/FX  WP   DEVNAM  REV
-------    ----       -------    --------   -----  --   ------  ---
ESA0       08-00-2B-12-00-9C
DKA0       A/0/0      DISK       426.25MB   FX          RZ25    0700
DKA100     A/1/0      DISK       426.25MB   FX          RZ25    0700
DKA400     A/4/0      RODISK     ......     RM     WP   RRD42   4.3d
..HOSTID.. A/7        INITR
..HOSTID.. B/7        INITR

>>>
```

Description: show device Display

The following table explains the elements in each column of the `show device` display.

Table 2–1 Elements of the show device Display

Column Head	Description
❶	A list of possible devices from which the system can be booted.
❷	The SCSI address setting of each device (middle number).
❸	The type of drive in the system.
❹	The capacity of this drive.
❺	Whether the drive in this system is a removable-media (RM)or a fixed-disk (FX) drive.
❻	Write-protected status of this drive.
❼	The name of the installed drive.
❽	The microcode revision number of the installed drive.

Step 3: Enter the show config Command

Enter the show config command as follows:

```
>>> show config Return
```

The show config command displays the following information:

- CPU type and firmware revision numbers of the system and I/O modules
- Revision number of the PALcode (privlege architecture library)
- Name and status of the tested device

Record this information for later reference. After adding or replacing TURBOchannel modules, you can compare the new system configuration with the previous one to verify that all options are present and functioning correctly.

Example: show config Display

Figure 2–3 shows an example of a show config display (the black callout numbers are for reference only). Table 2–2 defines the elements of the display.

Figure 2–3 show config Display

```
DEC 3000 M600/600S ❶
Digital Equipment Corporation
VPP PAL X4.41-82000101/OSF PAL X1.28- 82000201 - Built on  25-JUN-1994
        12:30:55.09  by XXXX ❷

  ❸       ❹           ❺
TCINFO    DEVNAM      DEVSTAT
------    --------    --------
            CPU       OK KN17-BA_V3.0-S4A3-I077-SV2.0 - DECchip 21064 P3.0
           ASIC       OK
            MEM       OK
8
7
            NVR       OK
            SCC       OK
             NI       OK
6
           SCSI       OK
1-PMAGB-BE  TC1
```

Description: show config Display

Table 2–2 explains the elements of each column of the `show config` display.

Table 2–2 Elements of the show config Display

Element	Description
❶	The product family and system model number.
❷	The number of the PALcode (privlege architecture library), the date on which it was built, and by whom.
❸	The number of the TURBOchannel slot and the mnemonic of the module in a slot. TURBOchannel slots 0 through 2 are reserved for TURBOchannel options; slot 6 is for the SCSI controller; slots 7 and 8 contain built-in system devices. If a TURBOchannel module requires more than one slot, only the first slot is listed.
❹	The mnemonic of the device.
❺	The status of the tested device. OK = device installed correctly and diagnosed to be OK ?? = error blank = no test for this device

System Configuration Error

Two question marks (??) in the DEVSTAT column next to a component name indicate an error. If you see an error indicator, as shown in Figure 2–4, note the field replaceable unit (FRU) number and error number. The FRU is a replaceable drive or module.

Figure 2–4 Configuration Display with Error

```
DEC 3000 M600/600S
Digital Equipment Corporation
VPP PAL X4.33-82000101/OSF PAL X0.13- 2000001 - Built on  25-JUN-1994
        12:30:55.09  by Jones

TCINFO    DEVNAM     DEVSTAT
------    ------     --------
            CPU      OK  KN17-BA - V3.0 -S07A-I052 - DECchip 21064
           ASIC      OK
            MEM      OK
8
7
            NVR      OK
            SCC      OK
             NI      ??  001  0172
6                        |    |_____________ Error Number
           SCSI      OK   |
1-PMAGB-BE  TC1           |_________FRU Number
```

What to Do About a Configuration Error

Refer to the owner's guide.

Step 4: Enter the show memory Command

Enter the show memory command as follows:

```
>>> show memory Return
```

The show memory command displays the following information:

- Bank number
- Memory size for each bank
- Start address for each bank

Record this information for later reference. After adding or replacing memory, you can compare the new system configuration with the previous one to verify that all options are present and functioning correctly.

Example: show memory Display

Figure 2–5 shows an example of a show memory display (the black callout numbers are for reference only). Table 2–3 defines the elements of the display.

Figure 2–5 show memory Display

```
  ❶          ❷             ❸
BANK #    MEMORY_SIZE    START_ADDRESS
------    -----------    --------------
  0        032 Mbytes    0x00000000
  1        032 Mbytes    0x02000000
  2        032 Mbytes    0x04000000
  3        032 Mbytes    0x06000000
```

Description: show memory Display

Table 2–3 defines each element of the `show memory` display.

Table 2–3 Elements of the show memory Display

Element	Description
❶	The bank numbers correspond to the four memory mother boards (MMBs). (See Chapter 5.)
❷	The memory size is the total amount of memory installed in each bank.
❸	The start address is the beginning address each memory bank.

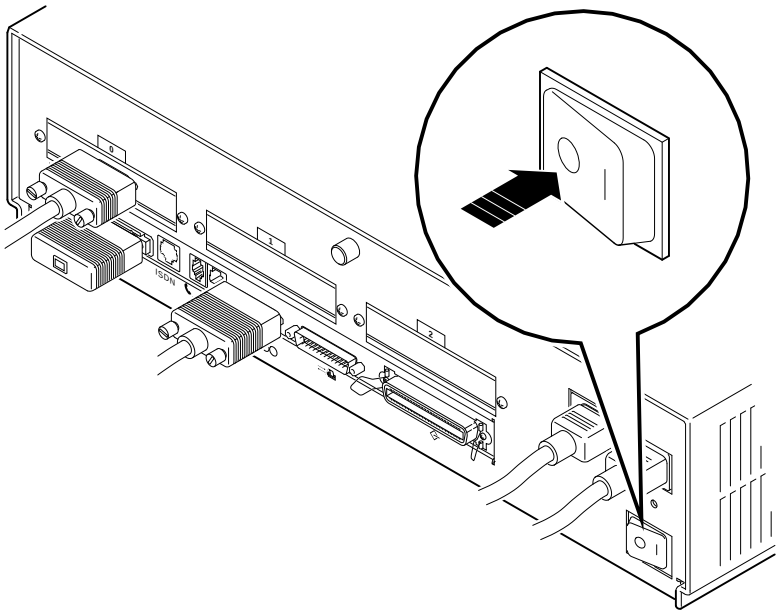
Shutting Down the Hardware

Turn Off Equipment

Shut down the hardware by following these steps:

1. Turn off (O) the system by pressing the On/Off switch on the back of the system unit to the off (O) position, as shown in Figure 2–6.

Figure 2–6 Turning Off the System Unit



2. Turn off (O) all expansion boxes.
3. Turn off (O) all peripheral devices (such as printers and modems).
4. Turn off (O) the monitor. (Turning off the system does not automatically turn off the monitor).

CAUTION: Component Damage

Do not unplug the power cord. This power connection helps protect internal components from damage caused by static discharge.

Removing the System Unit Cover

CAUTION: Capacitor Discharge

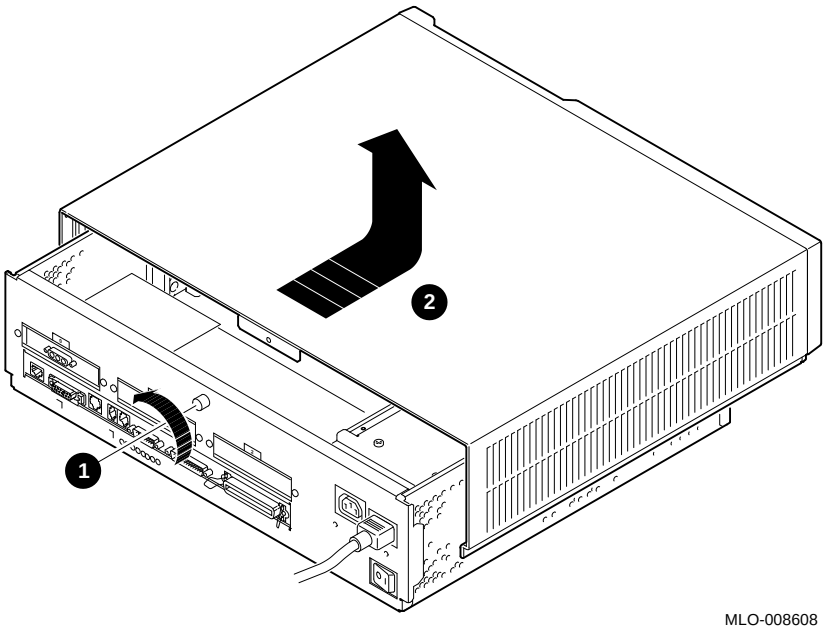
After you turn off the system and *before* you open the system unit, wait about fifteen seconds for the power supply capacitors to safely discharge.

Remove Cover

To remove the system unit cover, refer to Figure 2–7 and follow these steps:

1. Disconnect all external cables from the system unit except the power cord.
2. Loosen the captive screw ❶ on the back of the system unit.
3. With one hand on each side, pull firmly on the cover to pull it towards the front of the system unit and lift it off ❷.

Figure 2–7 Removing the System Cover



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Using the Antistatic Wrist Strap

CAUTION: Static Discharge

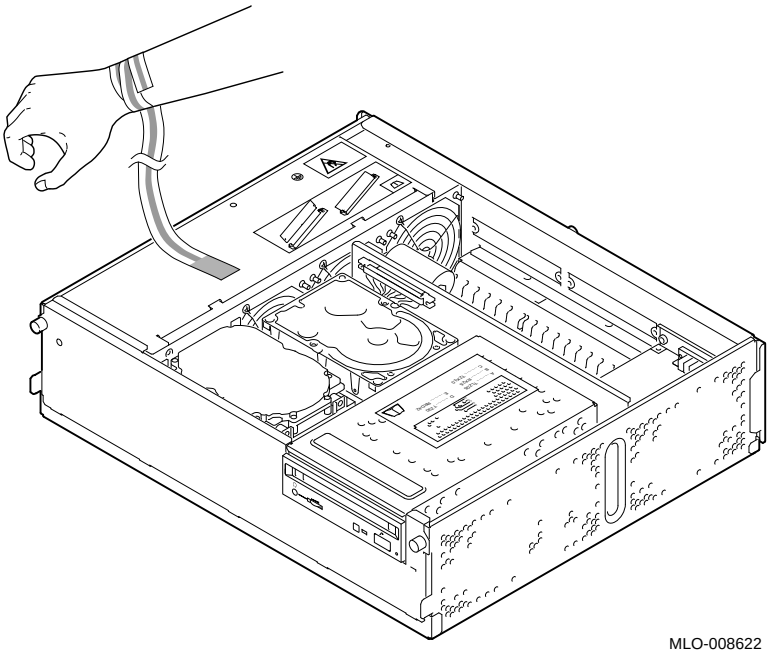
Before you begin adding options, attach the antistatic wrist strap that came with your system or option. Always use this strap when you work inside the system unit to avoid damage to internal devices from static discharge.

Attach the Wrist Strap

To attach the antistatic wrist strap, follow these steps and refer to Figure 2–8:

1. Locate the strap in an envelope labeled "Disposable Grounding Wrist Strap." Save this envelope for storing the strap later. You can use the strap several times before discarding it.
2. Remove the protective paper from the end of the strap that has the metal strip; save this paper for later use.
3. Press the metal strip onto the metal surface of the system unit.
4. Place the other end of the strap, sticky side down, on your wrist and wrap it around twice.

Figure 2–8 Using the Antistatic Wrist Strap



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3

Installing a Removable-Media Drive

Chapter Overview

IMPORTANT: Before You Install or Remove a Drive

You must prepare your system before you can install or remove a drive. See Chapter 2 to:

1. Back up files.
2. Shut down the system software.
3. Display the `show device` screen to review the SCSI ID addresses for each drive in the system. Refer to your drive's owner's guide if you need to set or change a SCSI ID address.
4. Remove the cover from the system unit.
5. Attach the antistatic wrist strap.
6. Remove the drive bracket.

In This Chapter

This chapter covers the following topics:

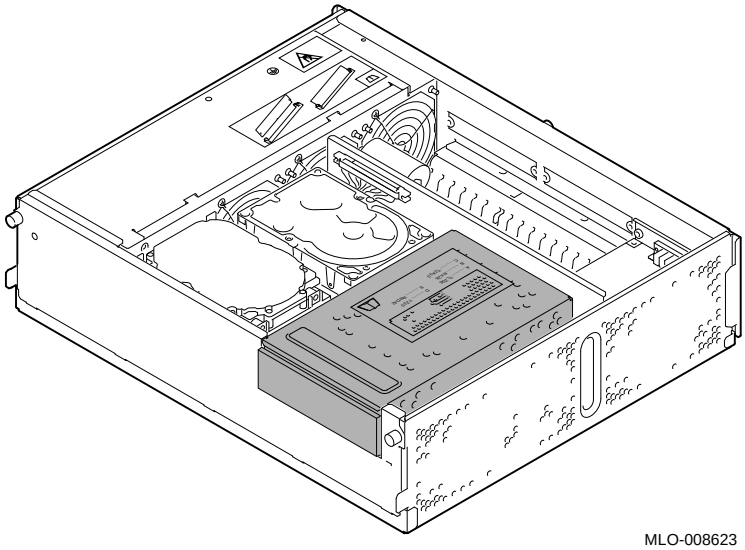
- Installing a Removable-Media Drive
- Removing a Removable-Media Drive

Installing a Removable-Media Drive

Where to Install

You can install one removable-media drive in the drive bracket shown in the shaded area of Figure 3–1.

Figure 3–1 Position of the Removable-Media Drive



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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.

Task Overview

These are the steps involved in preparing to install or replace a removable-media drive:

Step	Action
1	Remove the drive bracket.
2	Identify the internal power cable connections to the drive.

Step	Action
3	Identify the internal SCSI cable connections to the drive.
4	Connect the power and SCSI cables.
5	Attach the drive bracket.
6	Remove the blank bezel from the system cover.
7	Insert the drive inside the system unit.

The following sections describe these steps.

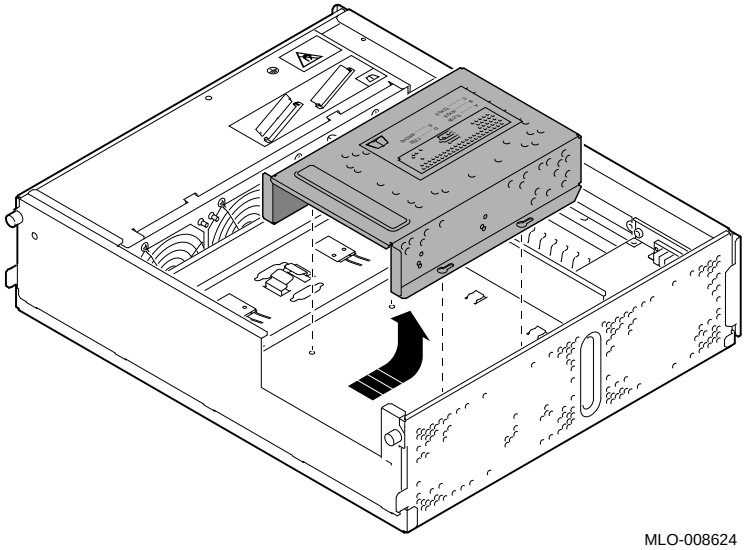
Step 1: Remove the Drive Bracket

To remove the drive bracket:

1. Loosen but do not remove the four screws, two on each side of the bracket, as shown in Figure 3–2, that secure the bracket to the drive plate.

   (If there is one or more fixed disk drive already in place, push those cables aside to reach the two screws on the left side of the drive bracket.)

Figure 3–2 Removing the Drive Bracket

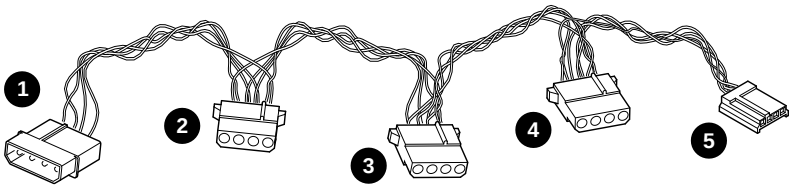


2. Slide the bracket towards the back of the system unit and lift it up and out.

Step 2: Identify the Internal Power Cable

The connectors on the internal power cable must be connected to the corresponding power ports on the back of each drive. The internal power cable and connectors are shown in Figure 3–3.

Figure 3–3 Power Cable and Connectors



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❶ Connects to the main power supply.

❷ Connects to a fixed disk drive, if any.

❸ Connects to a second fixed disk drive, if any.

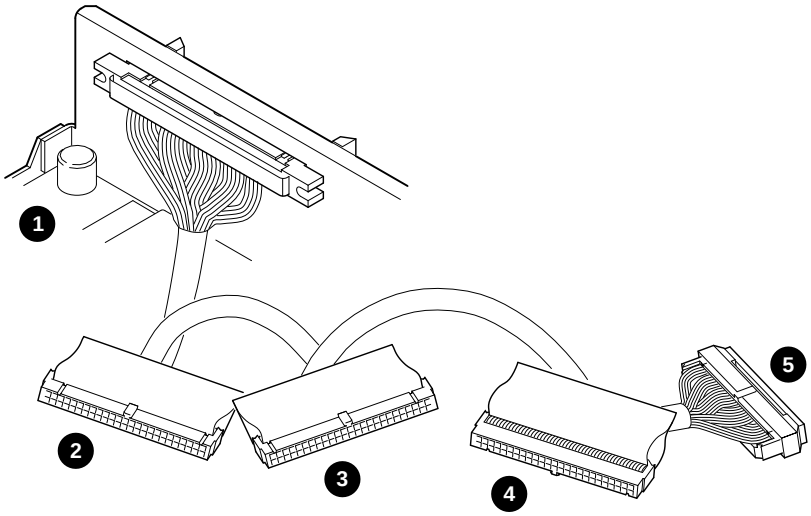
❹ Connects to a removable-media drive, if any.

❺ Connects to the second power connector on a diskette drive only.

Step 3: Identify the Internal SCSI Cable

The connectors on the internal SCSI cable must be connected to the SCSI port on each drive. The internal SCSI cable and connectors are shown in Figure 3–4.

Figure 3–4 SCSI Cable and Connectors



❶ Connects to the system SCSI bus.

❷ Connects to a rear fixed disk drive, if any.

❸ Connects to a front fixed disk drive, if any.

❹ Connects to a removable-media drive, if any

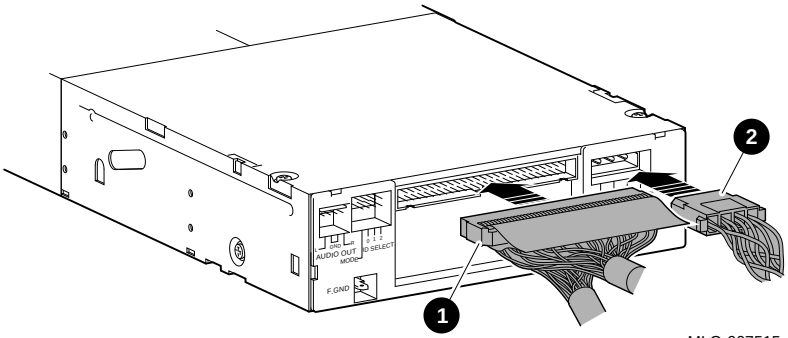
❺ SCSI bus terminator.

Step 4: Connect the Cables

To connect the SCSI and power cables to the drive:

1. Hold the SCSI cable connector with the key facing up for a diskette or tape drive and facing down for a compact disc drive.
2. As shown in Figure 3–5, connect the SCSI cable connector ❶ and the power cable connector ❷ to the ports on the back of the drive.

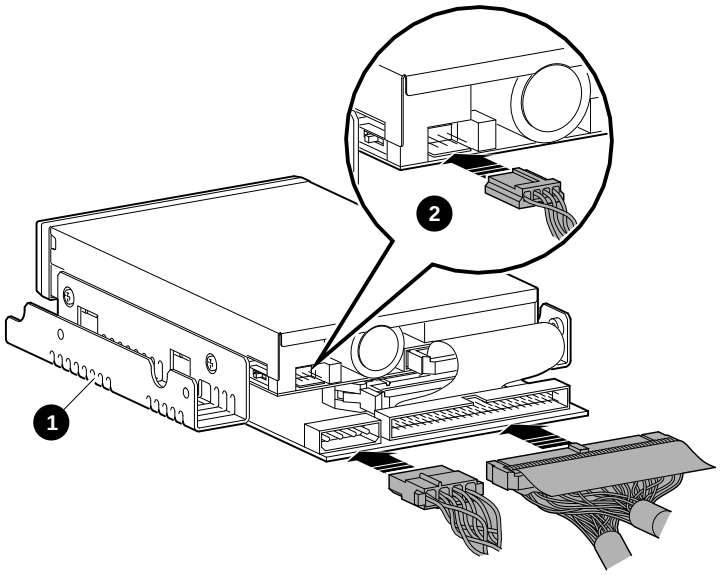
Figure 3–5 Connecting Cables to a Removable-Media Drive



Diskette Drive

Figure 3–6 shows the extension brackets ❶ and second power cable ❷ that you attach to the 3.5-inch diskette drive.

Figure 3–6 Diskette Drive Brackets and Cables

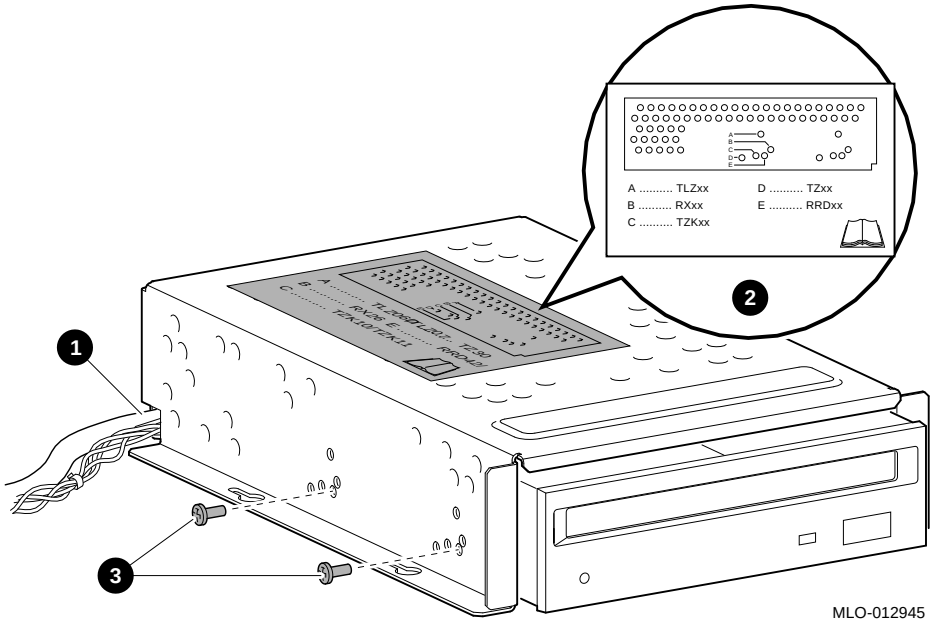


Step 5: Insert the Drive into the Bracket

1. Hold the bracket over the drive with the drive cables at the back.
2. Lower the bracket onto the drive.

3. Tuck the cables securely into the bracket and through the opening at the back left corner ❶, as shown in Figure 3–7.

Figure 3–7 Attaching the Drive Bracket



4. Adjust the drive slightly so that the four mounting holes, two on each side of the drive, align with the corresponding four holes in the drive bracket.

   The label ❷ illustrates which holes to use for securing each drive in the bracket.

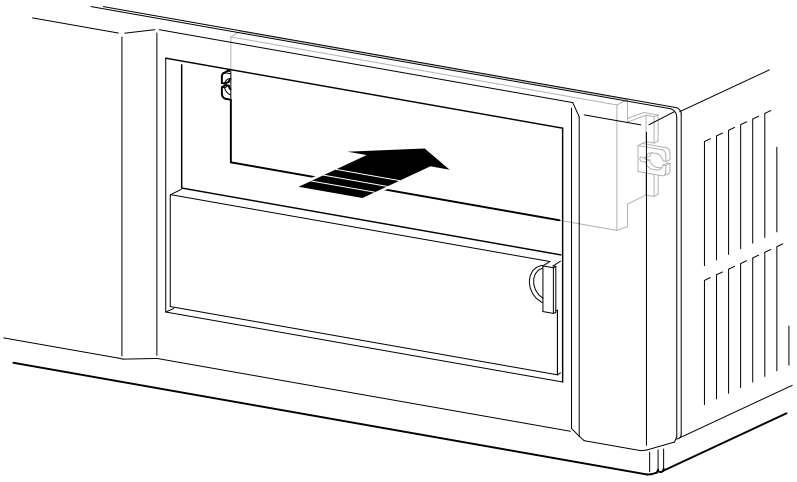
5. Using the screws that came with your drive, secure the two screws ❸ on each side of the bracket.

Step 6: Remove the Blank Bezel

To remove the blank bezel from the front panel of the system cover:

1. Remove the system cover.
2. Push inward on the bezel to remove it. Remove the bezel from the sides. Pushing on the middle may break it. Save the blank bezel in case you ever remove the drive and need to replace the bezel.

Figure 3–8 Removing the Blank Bezel from the System Cover



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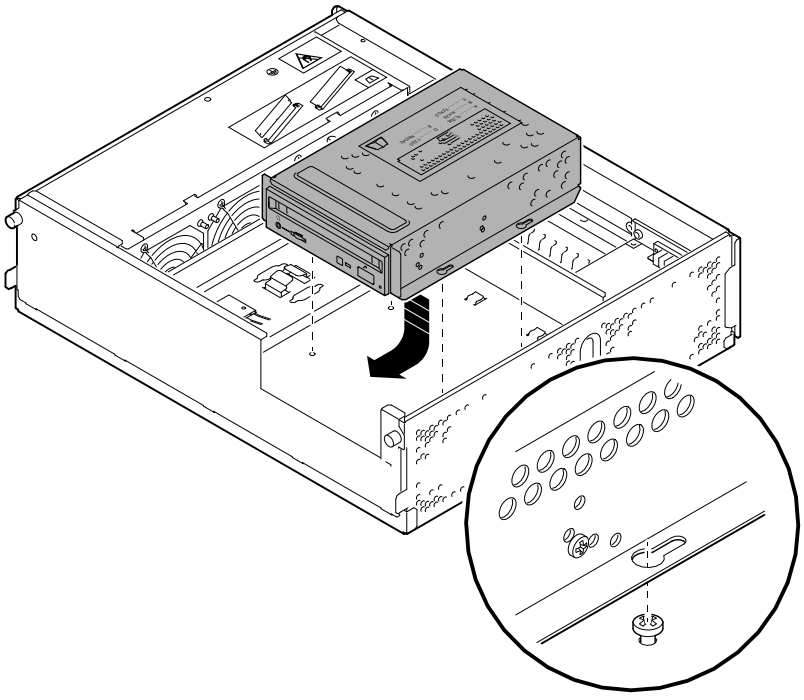
Step 7: Replace the Drive Bracket

To replace the drive bracket and drive inside the system unit, follow these steps and refer to Figure 3–9:

1. Place the two keyhole slots on each side of the bracket over the corresponding four screws on the drive plate.
2. Pull the bracket forward until its secure.
3. Tighten the four screws on the drive plate.

   If there is one or more fixed disk drives in place, push those cables aside to reach the two drive plate screws on the left of the drive bracket.

Figure 3–9 Replacing the Drive Bracket with the Drive Inside



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Removing a Removable-Media Drive

Remove the Drive from the Bracket

To remove a drive from the drive bracket:

1. Turn the bracket upside down.
2. Remove the four small screws, two on each side of the drive bracket, that secure the drive inside the bracket, and put them aside in a safe place.
3. Pull the drive part way out of the bracket.
4. Disconnect the SCSI cable by pulling on the white tab.
5. Disconnect the power cable.
6. Remove the drive by firmly pushing the back of the drive toward the front of the drive bracket.
7. Replace bezel.

What Comes Next

This completes the installation of a removable-media drive.

If you need to	Refer to
Add other options inside the system unit	The appropriate chapter for each option.
Add no other options inside the system unit	Chapter 7 to restore and check the system.

4

Installing a Fixed Disk Drive

Chapter Overview

IMPORTANT: Before You Install or Remove a Drive

You must prepare your system before you can install or remove a drive. See Chapter 2 to:

1. Back up files.
2. Shut down the system software.
3. Display the `show device` screen to review the SCSI ID addresses for each drive in the system. Refer to the options documentation.
4. Remove the cover from the system unit.
5. Attach the antistatic wrist strap.

In This Chapter

This chapter covers the following topics:

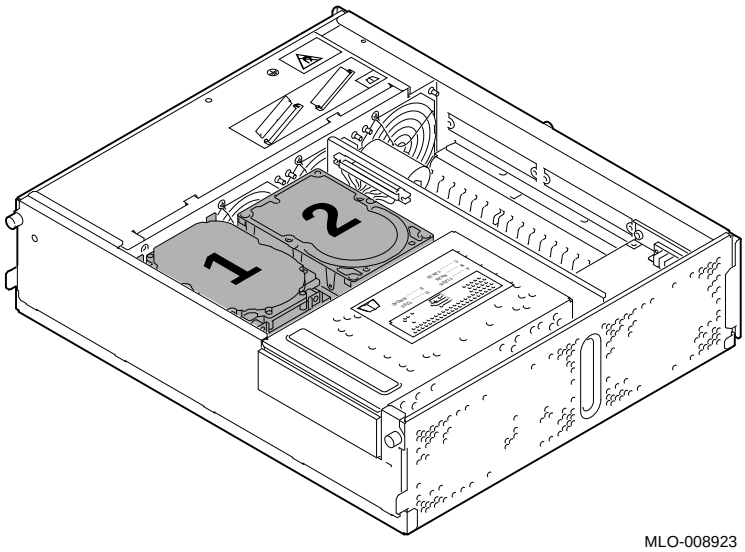
- Installing a Fixed Disk Drive
- Removing a Fixed Disk Drive

Installing a Fixed Disk Drive

Where to Install

If you have only one fixed disk drive, install it in the position closer to the front of the system unit, shown as position 1 in Figure 4–1. Install a second drive in position 2. Up to two fixed drives can be installed.

Figure 4–1 Position the Fixed Disk Drive



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SCSI ID Setting

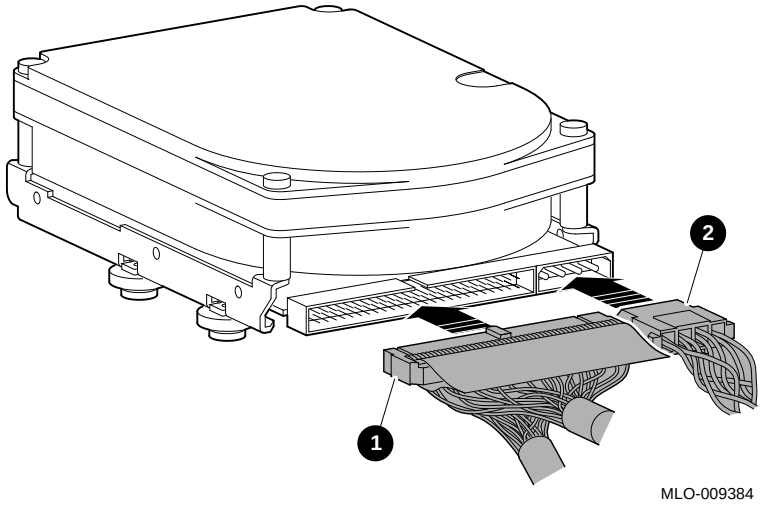
Before proceeding, make sure the drive you are installing is set to an available SCSI ID address. To set or change the SCSI ID address on the drive you are installing, refer to the option documentation.

Connect the Cables

To connect the SCSI and power cables to the drive:

1. Hold the SCSI connector with the key facing up.
2. Connect the SCSI cable ❶ and the power cable ❷ into the back of the drive. See Figure 4–2.

Figure 4–2 Connecting Cables to a Fixed Disk Drive



Insert the Drive

To insert the drive into the system unit:

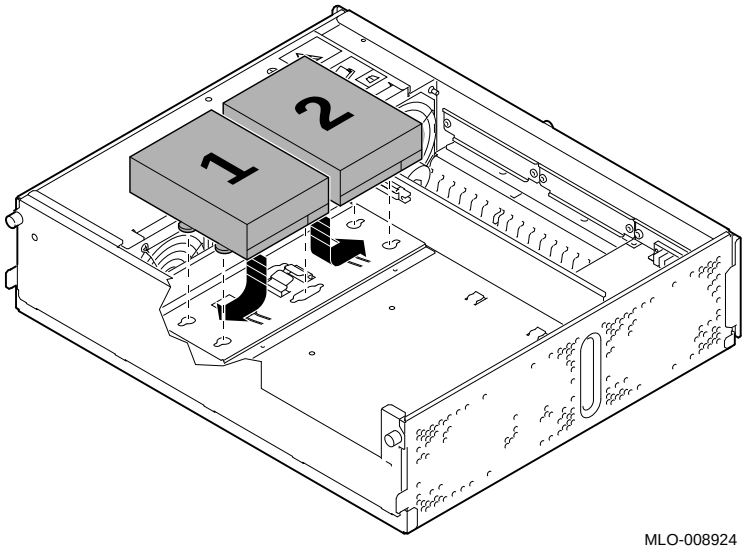
1. Hold the drive so that the attached cables are facing to your right.

   There is a small diagram stamped into the drive plate, (under the arrows in Figure 4–3) that shows this orientation.

2. Place the bumpers on the bottom of the drive into the keyhole slots in the drive plate.

3. Slide the drive towards the release latch, as shown in Figure 4–3, until the latch engages.

Figure 4–3 Installing a Fixed Disk Drive



This completes installation of a fixed disk drive.

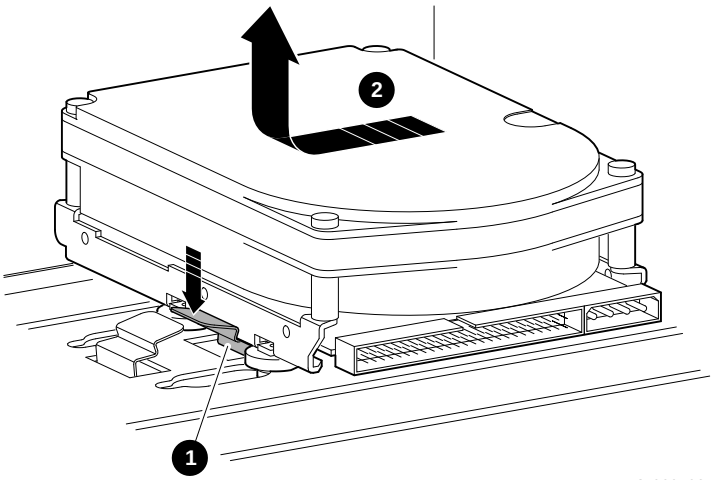
Removing a Fixed Disk Drive

Remove the Drive

To remove a fixed disk drive:

1. While pushing down on the release latch ❶ with the eraser end of a pencil, push the disk towards the release lever and lift out ❷, as shown in Figure 4–4.

Figure 4–4 Removing a Fixed Disk Drive



2. Disconnect the internal SCSI cable by pulling on the white tab and disconnect the power cable.
3. Carefully place all cables back into the system unit.

What Comes Next

If you need to	Refer to
Add other options inside the system unit	The appropriate chapter for each option.
Add no other options inside the system unit	Chapter 7 to restore and check the system.

5

Installing Memory Modules

Chapter Overview

IMPORTANT: Before You Install or Remove Memory

You must prepare your system before you can install or remove any memory modules. See Chapter 2 to:

1. Back up files.
2. Shut down the system software.
3. Display the `show memory` screen to review the memory configuration already installed.
4. Remove the cover from the system unit.
5. Attach the antistatic wrist strap.

In This Chapter

This chapter covers the following topics:

- Memory Mother Board and Module Description
- Installing Memory Modules
- Removing Memory Modules

Memory Mother Board and Module Description

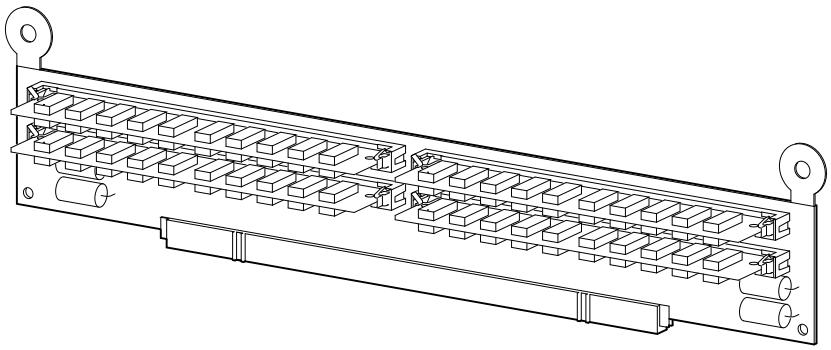
Memory Mother Board

The system holds four memory mother boards (MMBs). Each MMB includes:

- Two plastic removal tabs, one on each top corner
- Two double- or single-sided memory modules in an upper tier
- Two double- or single-sided memory modules in a lower tier

Figure 5–1 shows a deinstalled MMB with four double-sided memory modules installed.

Figure 5–1 Memory Mother Board



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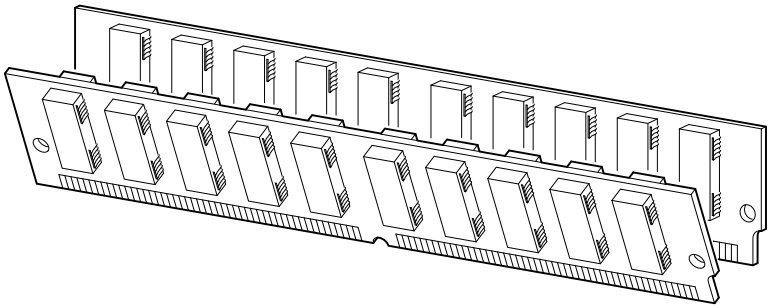
Memory Module

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 5–2 shows the memory modules.

Figure 5–2 Memory Modules



Memory Capacity

The system has the capacity to hold a maximum of 512 megabytes of memory: 16 memory modules. To see how much memory is installed, enter the `show memory` command at the console prompt (>>>).

Table 5–1 lists which modules to install for a given amount of memory.

Table 5–1 Memory Capacity

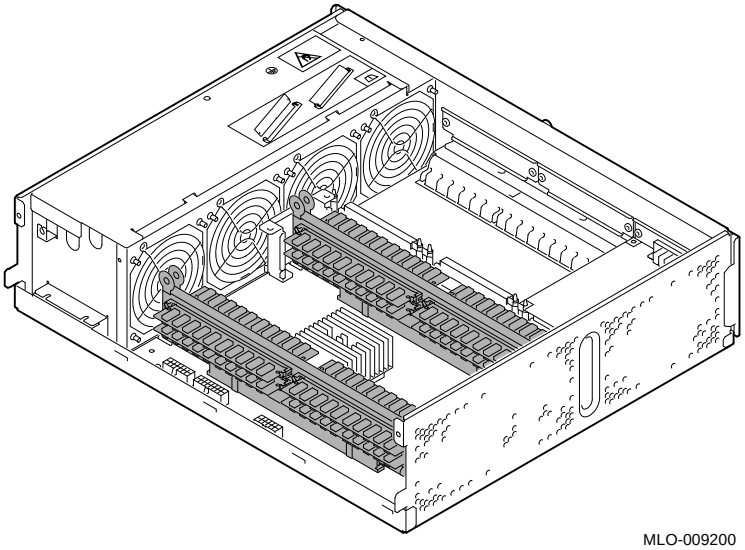
For This Total Amount of Memory	Upper Tier:	Lower Tier:
32 MB	Empty	4-MB modules
64 MB	4-MB modules	4-MB modules
64 MB	Empty	8-MB modules
96 MB	4-MB modules	8-MB modules
128 MB	8-MB modules	8-MB modules
128 MB	Empty	16-MB modules
160 MB	4-MB modules	16-MB modules
192 MB	8-MB modules	16-MB modules
256 MB	16-MB modules	16-MB modules
256 MB	Empty	32-MB modules
288 MB	4-MB modules	32-MB modules
320 MB	8-MB modules	32-MB modules
384 MB	16-MB modules	32-MB modules
512 MB	32-MB modules	32-MB modules

Installing Memory Modules

Where to Install

MMBs are located under the drive plate in the system unit, as shown in Figure 5–3.

Figure 5–3 Position of Memory Modules



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Task Overview

These are the tasks involved in installing additional memory modules:

Task	Action
1	Remove the drive plate.
2	Remove all four MMBs from the system unit.
3	Install the additional memory modules in sets of eight (two for each MMB).
4	Reinstall the MMBs.
5	Replace the drive plate.

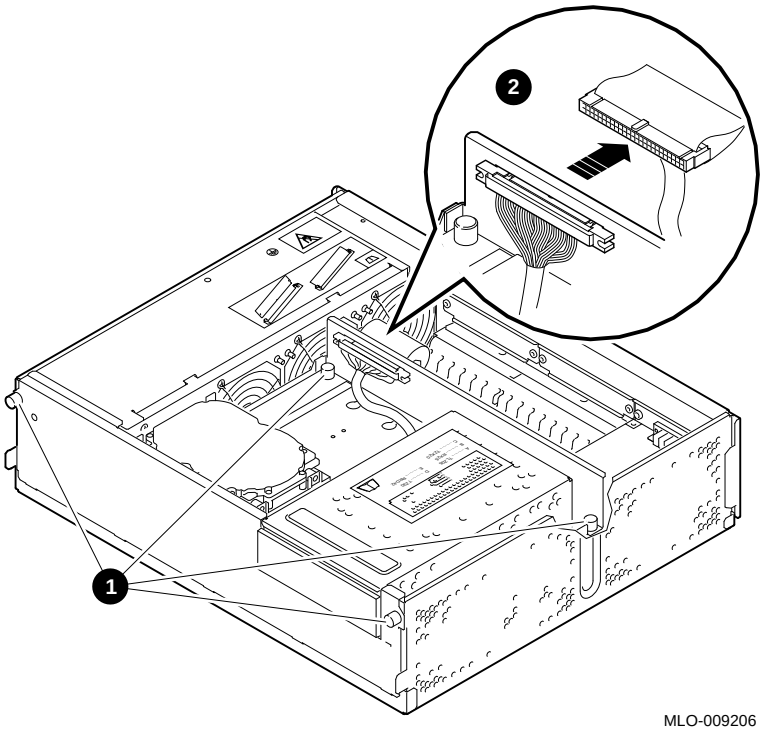
The following sections describe these steps.

Task 1: Remove the Drive Plate

The drive plate includes the front panel and the attached tray that holds the removable-media drive bracket and the two fixed disk drives (or the slots for these drives).

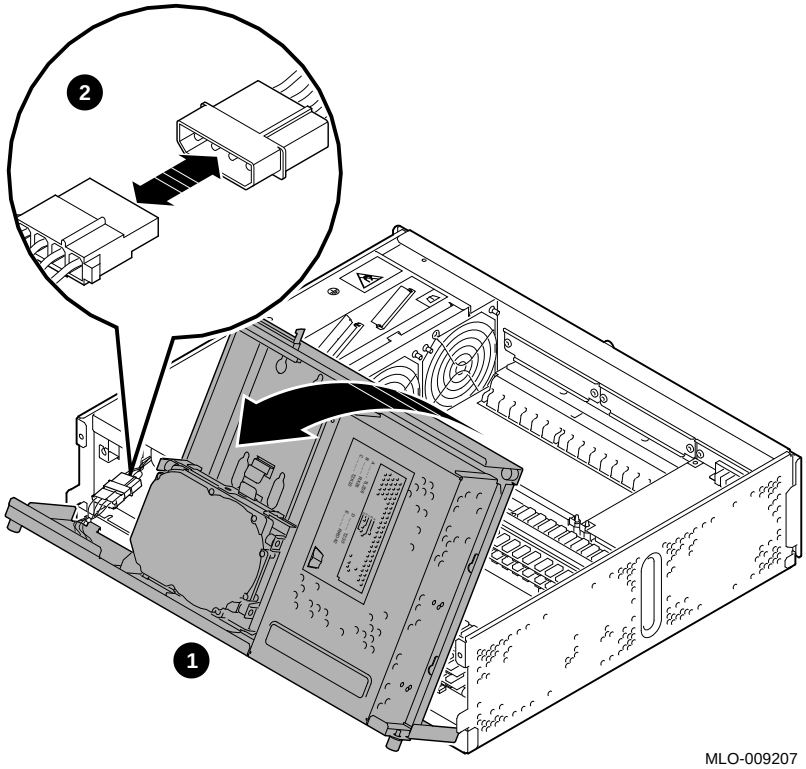
Refer to Figures 5–4 and 5–5 and follow Steps 1 through 5 to loosen and remove the drive plate:

Figure 5–4 Loosening the Drive Plate



1. Loosen the four captive screws, two on the rear of the drive plate and two on the front panel ❶.
2. Disconnect the SCSI cable connected to the back of the drive plate by pushing out the plastic tabs on either side of the cable connector and pulling on the white tab ❷.

Figure 5–5 Removing the Drive Plate



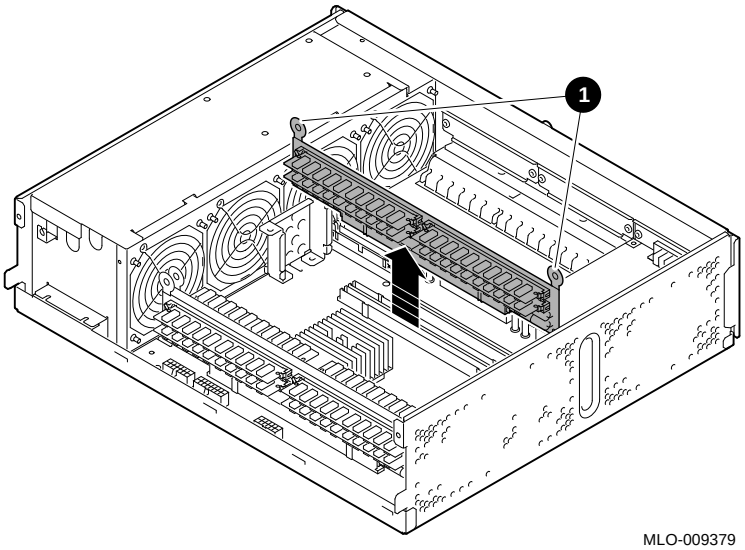
3. Pull up carefully on the back of the drive plate and tilt it forward ❶.
4. Disconnect the main internal drive power cable ❷.
5. Set the entire drive plate aside while you install or remove memory.

Task 2: Remove the MMBs

Remove all four MMBs from the system unit by following these steps:

1. Firmly pull straight up on the round plastic tabs ❶ at the top corner of each MMB, as shown in Figure 5–6.

Figure 5–6 Removing a Memory Mother Board



2. Place the MMB's flat surface down with any existing memory modules facing up.

CAUTION: System Module Damage

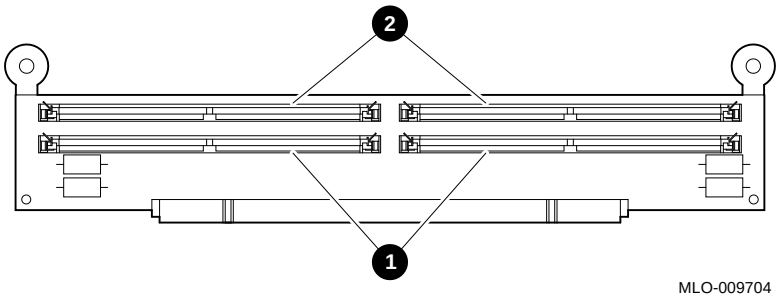
Do not install memory modules without removing the MMBs first. It is very likely you will damage the system module if modules are installed while the MMB is in place.

Installation Guidelines

Install memory modules using the following guidelines:

- Install modules in sets of eight, two modules in either the upper or the lower tier in each of the four MMBs.
- Install modules in the lower tiers ❶ first; upper tiers ❷ last, as shown in Figure 5–7.

Figure 5–7 Installing Memory Modules



- All upper tier modules must be of the same amount of memory and all lower tier modules must be of the same amount of memory. For example, the upper tier of MMB1 is 8 MB and the lower tier is 4 MB.

CAUTION: Use One Type of Module

Be sure to use only one size of memory module for each tier. If you mix sizes, the system may not recognize some of the memory.

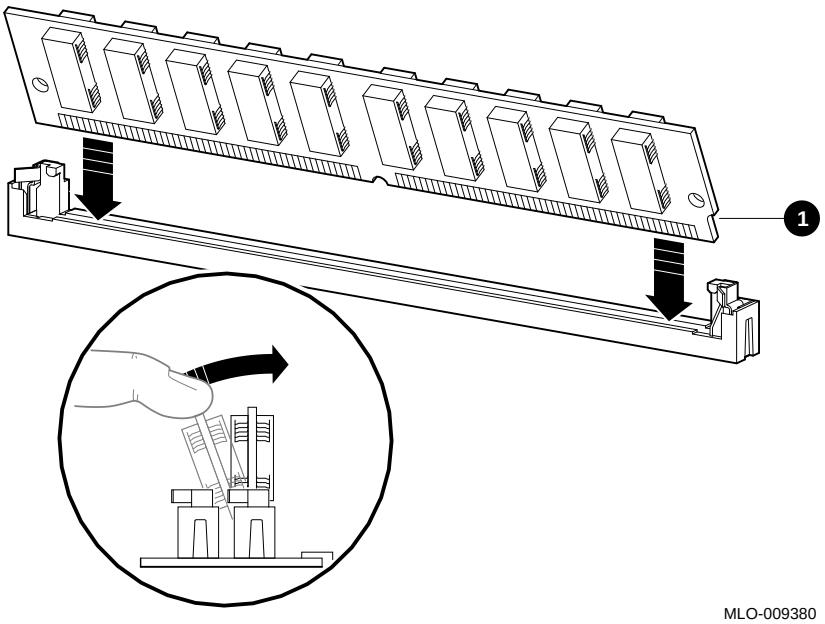
Also, do not attempt to use memory from any other system. Other modules are not necessarily compatible with this system.

Task 3: Install Memory Modules

To install memory modules:

1. Hold the module with the notch ❶ in the lower right corner, as shown in Figure 5–8.
2. Tilt the top of the module forward and lower the module into the angle connector in the MMB.
3. Push the module is upright, until the metal clips secure the module.

Figure 5–8 Installing a Memory Module



CAUTION: Damage

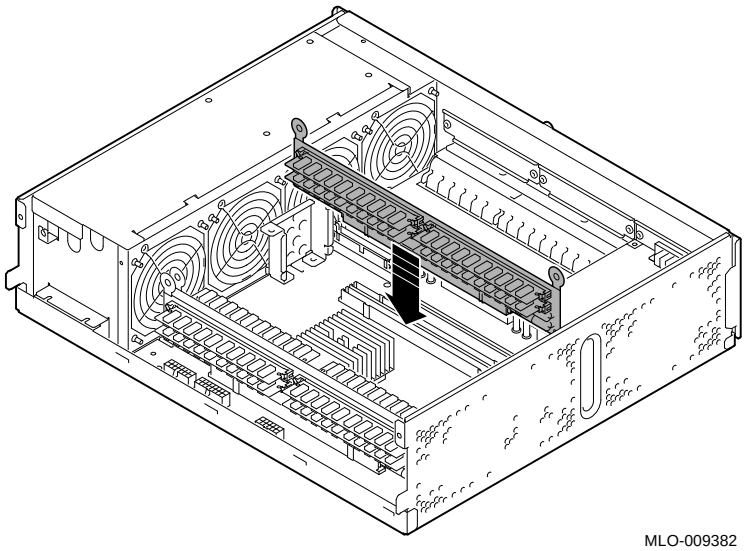
Always handle memory modules by their edges to avoid electrical damage and contamination of the module pins and connectors.

Task 4: Reinstall the MMBs

To reinstall each MMB:

1. Position the connector end of the module over the connector on the system unit.
2. Push firmly on the top ends and the top center to be sure the board is seated correctly, as shown in Figure 5–9.

Figure 5–9 Reinstalling a Memory Mother Board



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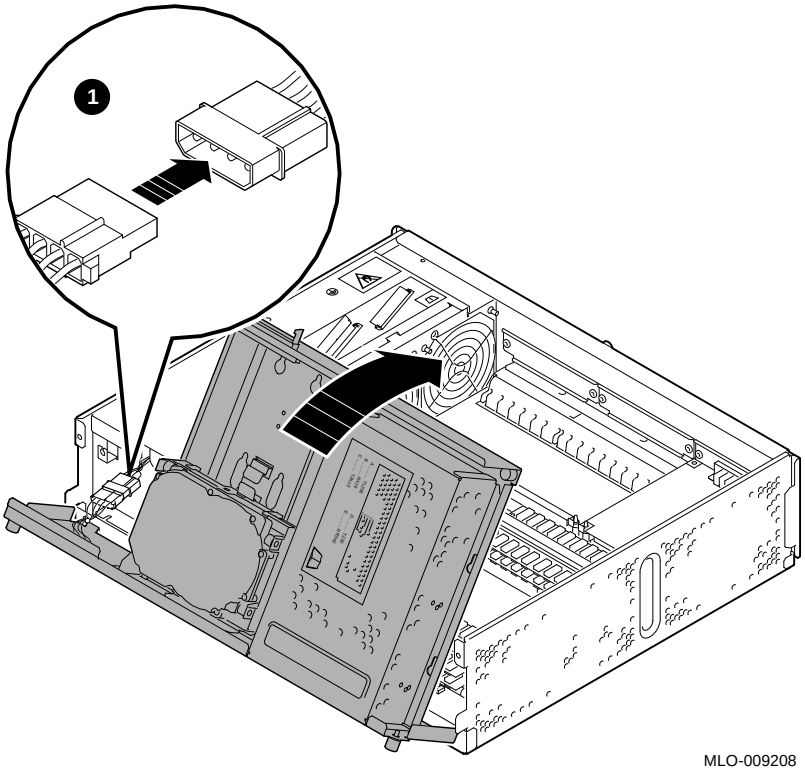
Task 5: Replace the Drive Plate

To replace the drive plate:

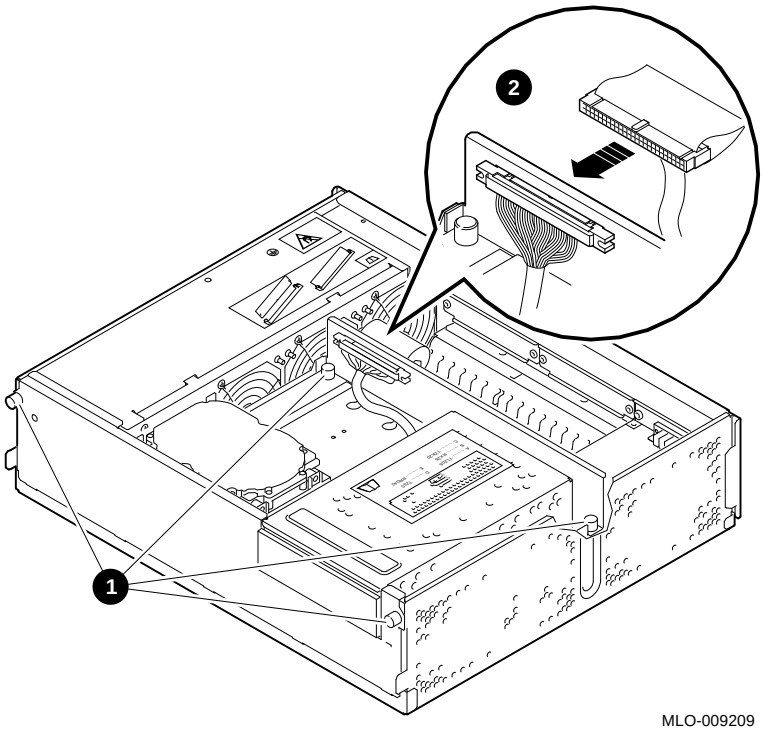
1. Align the five tabs along the bottom front panel with the slots on the front of the system unit.
2. Tilt the drive plate towards the back of the system unit, as shown in Figure 5–10.
3. Reconnect the main internal power cable ❶.

Figure 5–10 Tilting the Drive Plate Back



4. Tighten the two front captive screws, one on each end of the front of the drive plate, and the two back captive screws that hold the drive plate to the system unit, ❶ in Figure 5–11.
5. Reconnect the internal SCSI cable ❷ to the back of the drive plate.

Figure 5–11 Replacing the Drive Plate



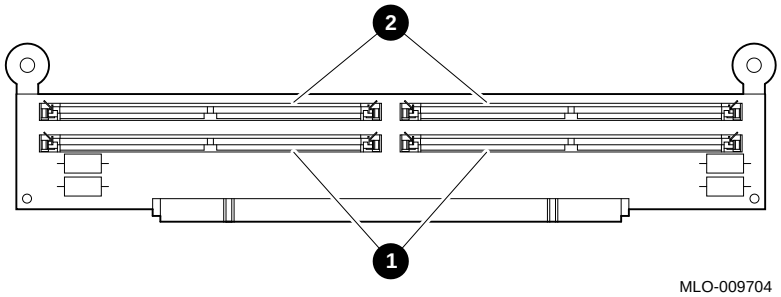
Removing Memory Modules

Removal Guidelines

Remove memory modules using the following guidelines:

- Remove modules in sets of eight, two modules from each of the four MMBs.
- Remove modules from the upper tiers ❷ first; lower tiers ❶ last, as shown in Figure 5–12.

Figure 5–12 Removing Memory Modules



- The remaining modules in all upper tier modules must be of the same amount of memory and in all lower tier modules must be of the same amount of memory.

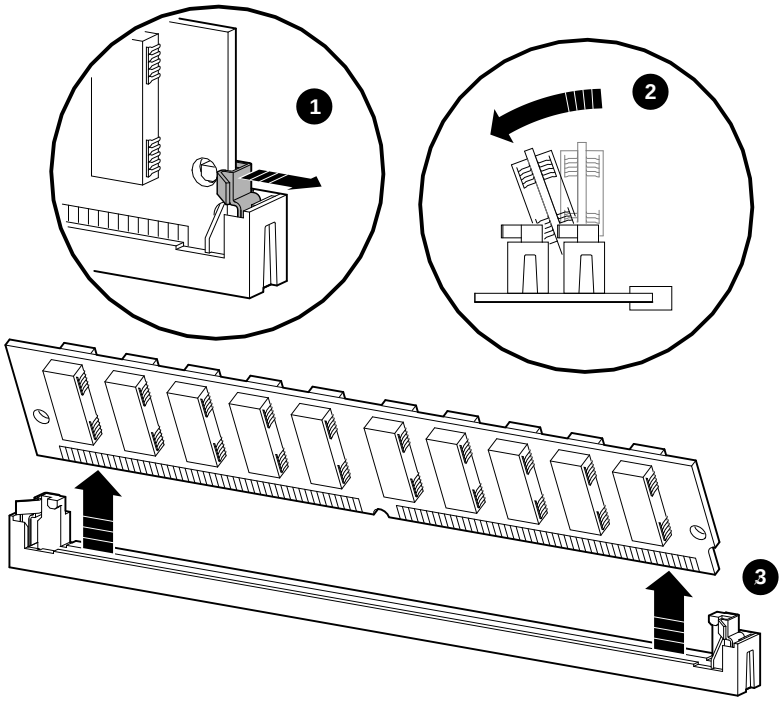
Remove a Module

Remove memory by removing the upper tier modules first in sets of eight: two from each MMB.

To remove a memory module, refer to Figure 5–13 and follow these steps:

1. Remove the drive plate as described earlier in this chapter.
2. Remove each MMB by pulling up firmly on the round plastic tabs, as shown in Figure 5–6, then lay the MMB flat.

Figure 5–13 Removing a Memory Module



3. Remove each memory module from the MMB by releasing the spring clips at each end of the module ❶, as shown in Figure 5–13.
4. Holding the module by its edges, tilt it towards you ❷ and pull up ❸.

After you remove as much memory as you want to, place each MMB back into its slot in the system unit.

This completes installation of the memory modules.

What Comes Next

If you need to	Refer to
Add other options inside the system unit	The appropriate chapter for each option.
Add no other options inside the system unit	Chapter 7 to restore and check the system.

6

TURBOchannel Options

Chapter Overview

IMPORTANT: Before You Install or Remove TURBOchannel Options

You must prepare your system before you can install or remove any of the TURBOchannel options. See Chapter 2 to:

1. Back up files.
2. Shut down the system software.
3. Display the system configuration to determine the options already installed.
4. Remove the cover from the system unit.
5. Attach the antistatic wrist strap.

In This Chapter

This chapter covers the following topics:

- TURBOchannel Description
- Installing a TURBOchannel Option Module
- Removing a TURBOchannel Option Module

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.

TURBOchannel Description

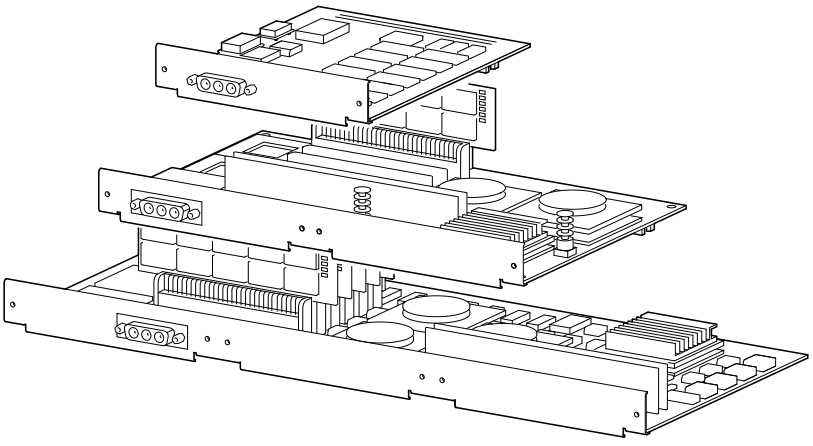
Definition

A TURBOchannel is a high-performance interconnection that allows you to use a variety of Digital and third-party graphics, multimedia, and communications options. The TURBOchannel has a synchronous asymmetrical I/O channel that connects option modules to the system module. The system module and an option module have read or write access to each other, but option modules have no access to other option modules.

TURBOchannel Module Widths

TURBOchannel option modules come in three different widths: single-, double-, or triple-width. Each module occupies 1, 2, or 3 slots, as shown in Figure 6–1.

Figure 6–1 TURBOchannel Option Widths



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Compatibility with Monitors

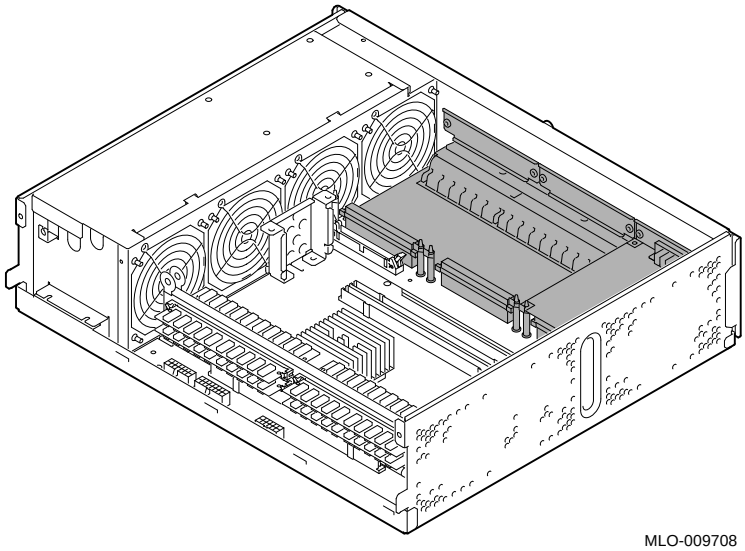
Not all graphics modules are compatible with all monitors. Before upgrading your graphics module, consider the monitor requirements. Consult your Digital service representative and your monitor documentation for more information.

Installing a TURBOchannel Option Module

Where to Install

The shaded area in Figure 6–2 shows where to install the TURBOchannel option in the system unit.

Figure 6–2 Location of TURBOchannel Options



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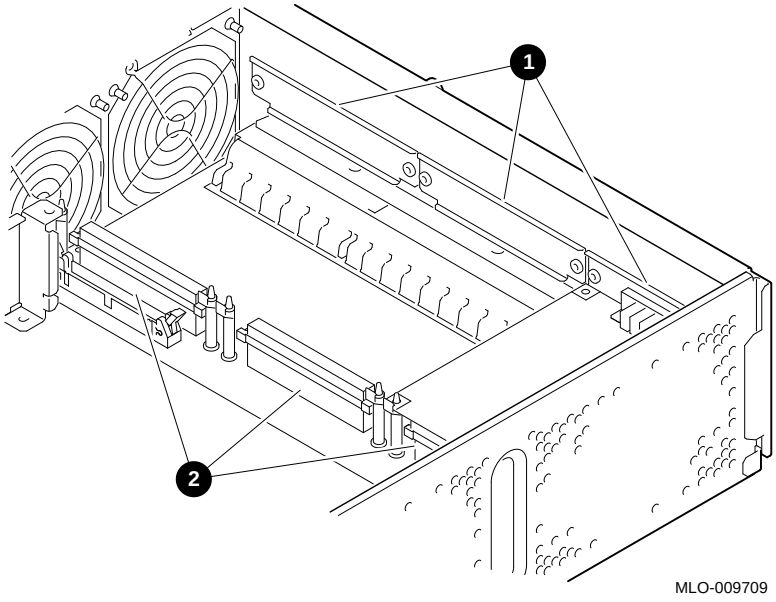
As shown in Figure 6–3, there are three TURBOchannel connectors ❷ on the inside of the system unit, behind the drive plate. There are also three corresponding slots ❶, labeled 0, 1, and 2, on the back of the system unit through which the TURBOchannel option ports extend.

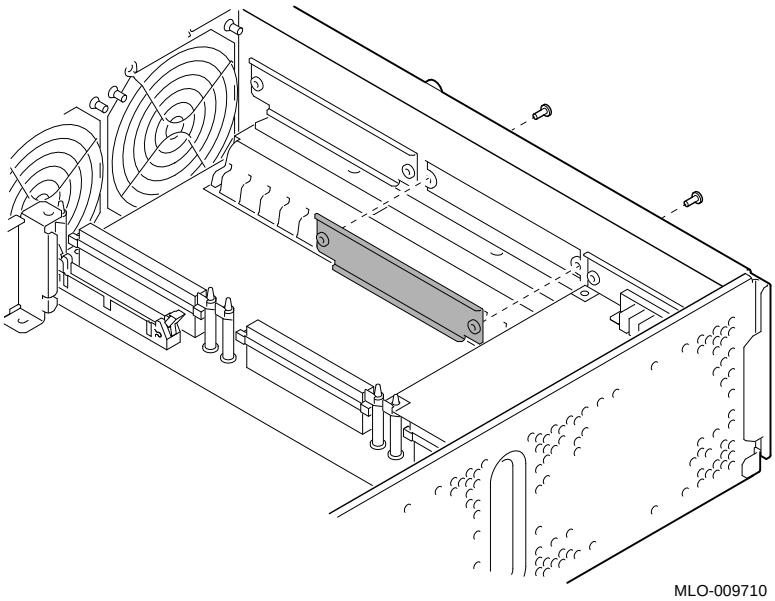
Figure 6–3 TURBOchannel Slots and Connectors



Remove the Metal Filler Plate

Until you add a TURBOchannel option, there is a metal filler plate over each slot opening at the back of the system unit. Each module port requires one open slot. Remove the two screws that hold the metal filler plate in place over the appropriate slot and remove the plate, as shown in Figure 6–4. You will need to check which plate to remove for each module first.

Figure 6–4 Removing a Metal Filler Plate



Keep the Metal Plate

Set aside the two screws for attaching the new module, and save the metal filler plate in case you ever remove the option and need to replace the plate.

Preparing Modules

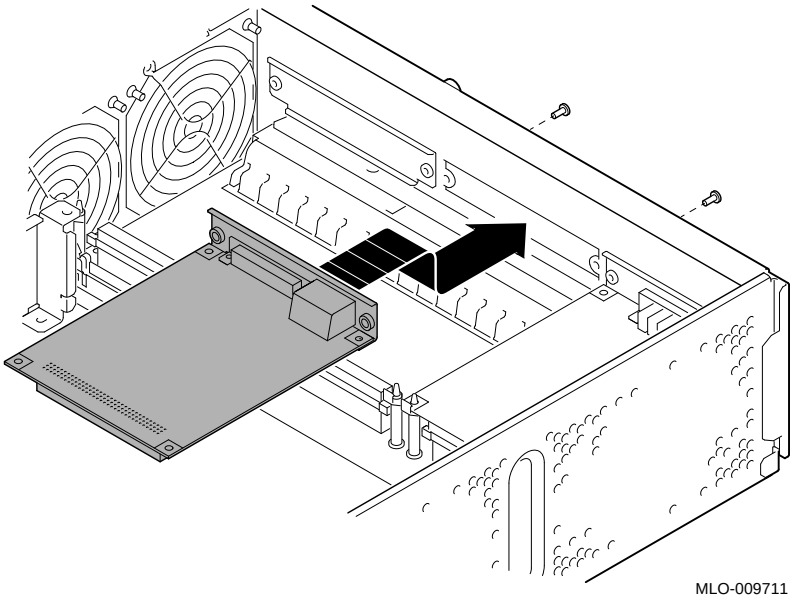
Before installing certain modules, you may need to make sure that jumpers are set correctly or remove mechanical spacers. Refer to the options documentation.

Insert the TURBOchannel Module

To insert a TURBOchannel option module, follow these steps:

1. Select one to three slots, depending on the width of the module. You may need to move an existing module to allow installation of a double- or triple-width module.
2. Orient the TURBOchannel module inside the system unit so that the module port faces the slot opening at the back of the system unit, as shown in Figure 6–5.

Figure 6–5 Installing a TURBOchannel Module



3. Insert the module port into the open slot at the back of the system.
4. Align the connectors, then firmly press on the back corners of the module so that the module's connector fits securely into the connector on the system board and snap into the mounting posts.
5. Secure the TURBOchannel module to the back of the system unit using the two Phillips screws that held the metal filler plate. (A double-width module has four screws to secure, a triple-width module has six screws to secure.)

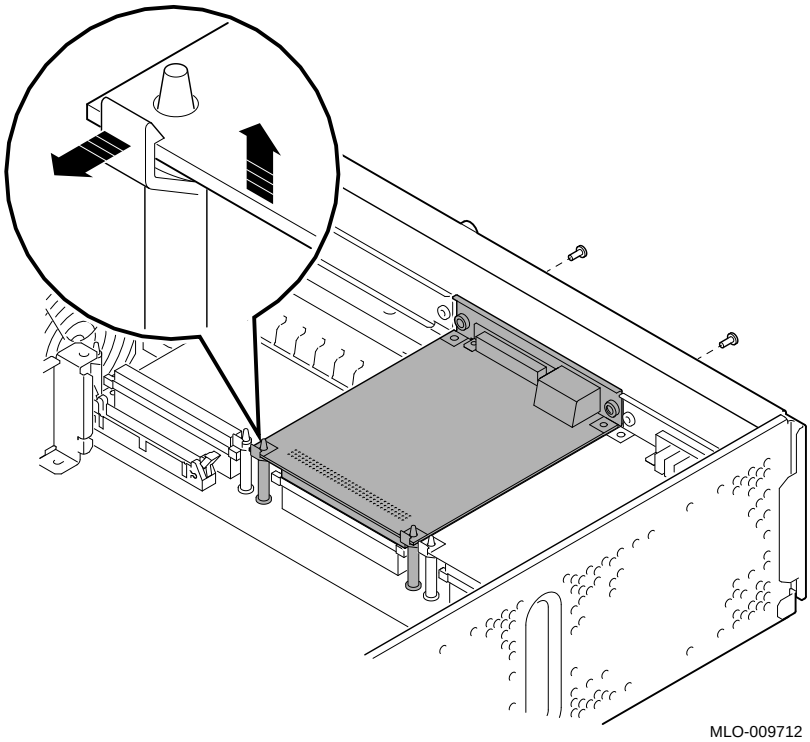
Removing a TURBOchannel Option Module

General Removal Procedure

To remove all TURBOchannel options, refer to Figure 6–6 and follow these steps:

1. Remove the screws that secure the module to the back of the system unit.
2. Pull back on each mounting post catch, then pull up on the back of the TURBOchannel option, and slide the module out of the TURBOchannel slot.
3. Using the screws you removed, replace the metal filler plate over any open slots.

Figure 6–6 Removing a TURBOchannel Module



What Comes Next

This completes the installation of TURBOchannel options.

If you need to	Refer to
Add other options inside the system unit	The appropriate chapter for each option.
Add no other options inside the system unit	Chapter 7 to restore and check the system.

7

Restoring the System

Chapter Overview

In This Chapter

This chapter covers the following topics:

- Saving the Wrist Strap
- Replacing the System Unit Cover
- Restarting and Testing the System

Saving the Wrist Strap

Remove the Antistatic Wrist Strap

After you have installed all the internal options you want at this time, remove and save the antistatic wrist strap as follows:

1. Remove the copper end of the strap from the system unit.
2. Cover the sticky surface with the protective paper you removed earlier.
3. Unwrap the strap from your wrist.
4. Refold the strap and save it in the envelope it came in for future use.

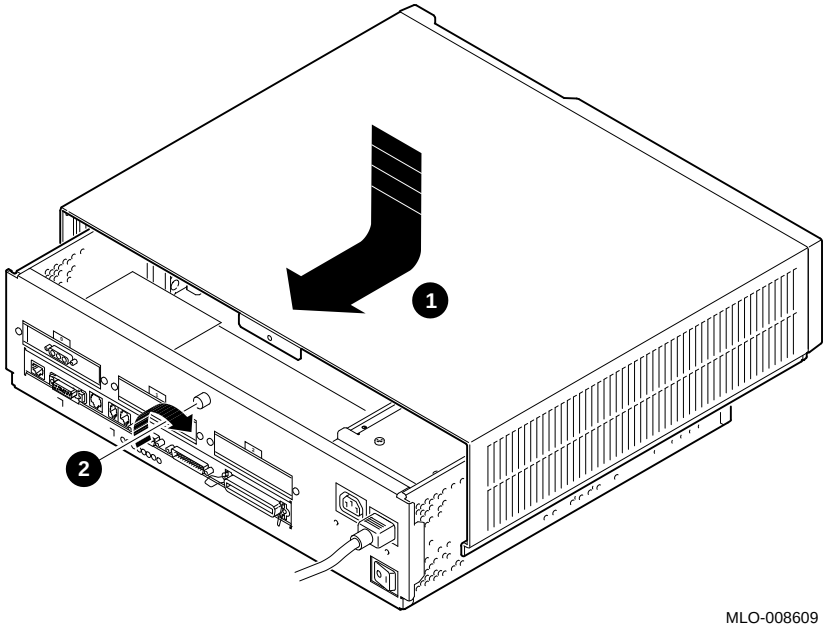
Replacing the System Unit Cover

Slide the Cover onto the System Unit

To replace the system cover:

1. Place the cover over the top of the system unit.
2. Firmly slide the cover toward the back ❶, as shown in Figure 7–1.

Figure 7–1 Replacing the System Cover



3. When the cover is firmly in place, tighten the captive screw ❷ on the back of the system unit.

Restarting and Testing the System

Task Overview

These are the tasks involved in restarting the system and testing internal options:

Task	Action
1	Reconnect the cables on the back of the system unit.
2	Turn on your equipment.
3	Record messages.
4	Enter the device and configuration commands.

The following sections describe these steps.

Task 1: Turn On Equipment

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

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

When you turn on the system successfully, you should see a similar display to the one that is shown when you enter the `show config` console command, followed by either the console prompt (>>>) or your operating system prompt.

Task 2: Record Messages

If any messages are displayed, write them down in case you need to contact your Digital services representative.

Refer to the *DEC 3000 Model 600/600S/700 AXP Owner's Guide* for an explanation of common messages and for more information about testing the system.

Task 3: Enter the Device and Configuration Commands

To confirm that the options are connected correctly:

1. Enter the `show device` command at the console prompt to display the status of the drives, as explained in Chapter 2.

   From this display, you can:

   - Compare the latest display with the display you viewed when you prepared the system before adding a device. You should see new drives and all the drives that were in the system before you made additions. If a new drive is not in the list, it has not been installed properly.
   - Verify that devices are set to the correct SCSI settings (ADDR) so that all devices can be accessed.
   - Verify that there are no error messages. If there are error messages, write them down.

2. Enter the `show config` command at the console prompt to display the TURBOchannel configuration, as explained in Chapter 2.
3. Enter the `show mem` command at the console prompt to display the memory configuration, as explained in Chapter 2.

If You See Error Messages

If you see error messages during the startup or `show config` test procedures, check the following:

- Are all cables inside and outside the system properly connected?
- Are all modules fully seated in their connectors?
- Are SCSI switches and jumpers set correctly? (No two devices should have the same SCSI setting.)

If you continue to see error messages, refer to your *DEC 3000 Model 600/600S/700 AXP Owner's Guide*, or contact your Digital services representative.

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