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DEC 3000 AXP Model 500/500S

Options Guide

Preliminary Documentation

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Preliminary Documentation

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Preface

Audience This guide is for anyone who is comfortable opening the DEC 3000 AXP Model 500/500S system unit to install internal options.

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

- How to install
- How to test for successful installation
- How to use RRD42, RX26, TZK10, and TLZ06 drives
- Drive specifications

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 the RRD42 compact disc drive, including a description of the drive, setting jumpers, installing the drive in the system unit, and using the drive. Drive specifications are also included. |

| Designation | Contents |
|-------------|--|
| Chapter 4 | Information on the RX26 diskette drive, including a description of the drive, setting switches, installing the drive in the system unit, and using the drive. Drive specifications are also included. |
| Chapter 5 | Information on the TZK10 tape drive, including a description of the drive, setting jumpers, installing the drive in the system unit, and using the drive. Drive specifications are also included. |
| Chapter 6 | Information on the TLZ06 tape drive, including a description of the drive, setting switches, installing the drive in the system unit, and using the drive. Drive specifications are also included. |
| Chapter 7 | Information on the RZ25 fixed disk drive, including a description of the drive, setting jumpers, and installing the drive in the system unit. Drive specifications are also included. |
| Chapter 8 | Information on the RZ26 fixed disk drive, including a description of the drive, setting jumpers, and installing the drive in the system unit. Drive specifications are also included. |
| Chapter 9 | Information on memory modules, including how to determine which modules you need, installing them in and removing them from the system unit. |
| Chapter 10 | Information on TURBOchannel options, including an overview of TURBOchannel and the system unit option positions, a description of available TURBOchannel options, and installing them in and removing them from the system unit. |
| Chapter 11 | What you need to do to replace panels and confirm that options were installed correctly inside your system unit. |
| Chapter 12 | A description of available external options for your system. |

| Designation | Contents |
|-------------|--|
| Appendix A | A list of associated documentation. |
| Glossary | A list of terms that you may not be familiar with, along with their definitions. |
| Index | To assist you in locating information quickly. |

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 mem, and show dev console commands

For more information on these diagnostic test displays, refer to the *DEC 3000 AXP Model 500/500S Owner's Guide*. For more information on SCSI concepts, refer to *Small Computer System Interface: An Overview*, listed in Appendix A.

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 DEC 3000 AXP Model 500/500S 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 provide information to prevent damage to equipment or software. Read these carefully. |
| IMPORTANT: | Important notations provide 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. |

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.

Options Overview

External Options

A number of options are available for the DEC 3000 AXP Model 500/500S. 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 DEC 3000 AXP Model 500/500S system and shows where to install them in the system unit. See Chapter 12 for information on external options.

Internal Options

Current Options

Your DEC 3000 AXP Model 500/500S can have the following internal options:

- RRD42 compact disc drive
- RX26 diskette drive
- TZK10 cartridge tape drive
- TLZ06 cassette tape drive
- RZ25 and RZ26 fixed disk drives
- *Memory modules*
- TURBOchannel option modules

These options are discussed in detail in Chapter 3 through Chapter 10 of this guide.

Future Options

The previous list represents the internal options available with the first shipments of the DEC 3000 AXP Model 500/500S. Additional options may be available at a later time.

Drives

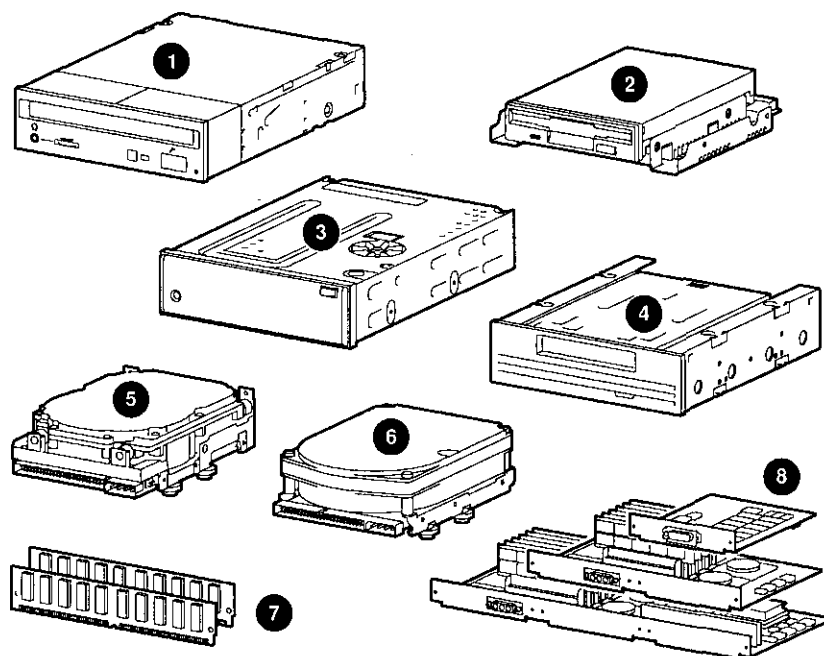
Your system unit can hold up to two half-height removable-media drives, that is, drives from which the storage medium is removable (such as the RRD42, RX26, TZK10, or TLZ06 drives). To add more than two removable-media drives, you will need an expansion box. For more information on expansion boxes, see Chapter 12.

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 options you can add to the system unit.

Figure 1-1 Internal Options You Can Add



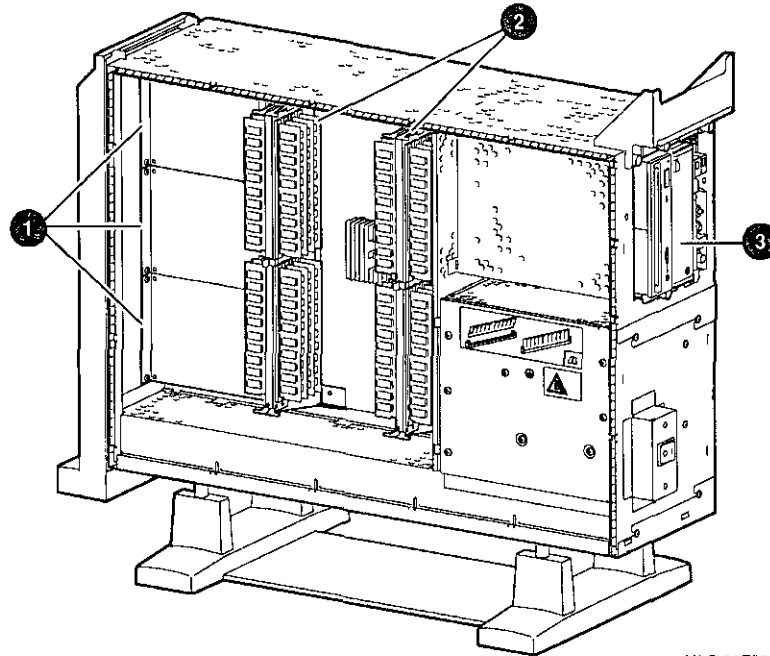
MLO-009397

- | | |
|----------------------------|-------------------------|
| ① RRD42 Compact Disc Drive | ⑤ RZ25 Fixed Disk Drive |
| ② RX26 Tape Drive | ⑥ RZ26 Fixed Disk Drive |
| ③ TZK10 Tape Drive | ⑦ Memory modules |
| ④ TLZ06 Tape Drive | ⑧ TURBOchannel modules |

**Location
of Internal
Options: Left
Side and Front**

Figure 1-2 shows where to install the TURBOchannel modules ①, memory modules ②, and removable-media drives ③ 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)



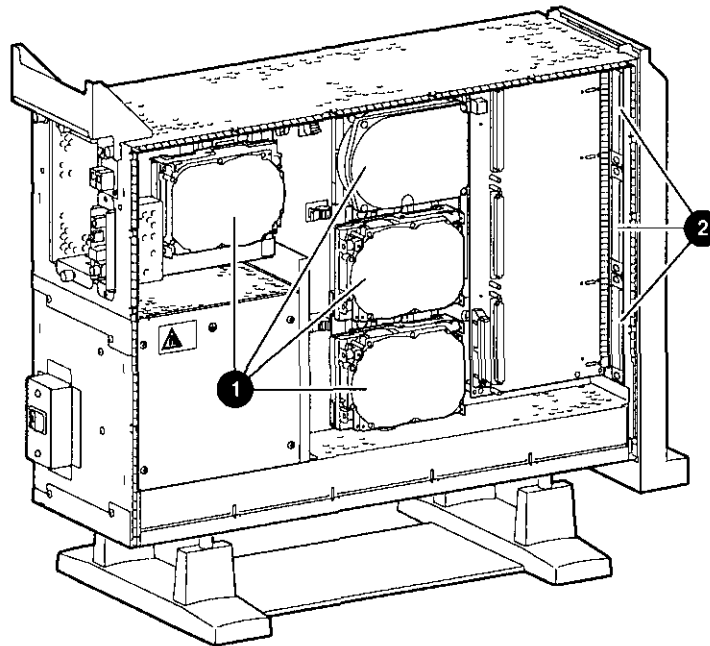
MLO-007500



**Location
of Internal
Options: Right
Side**

Figure 1-3 shows where to install the fixed disk drives ❶ and TURBOchannel modules ❷ 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:

- Back Up Your Files
- Shut Down Software
- Press the Halt Button
- Displaying the Configuration
- Shutting Down Hardware
- Removing Panels
- Using an Antistatic Wrist Strap

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

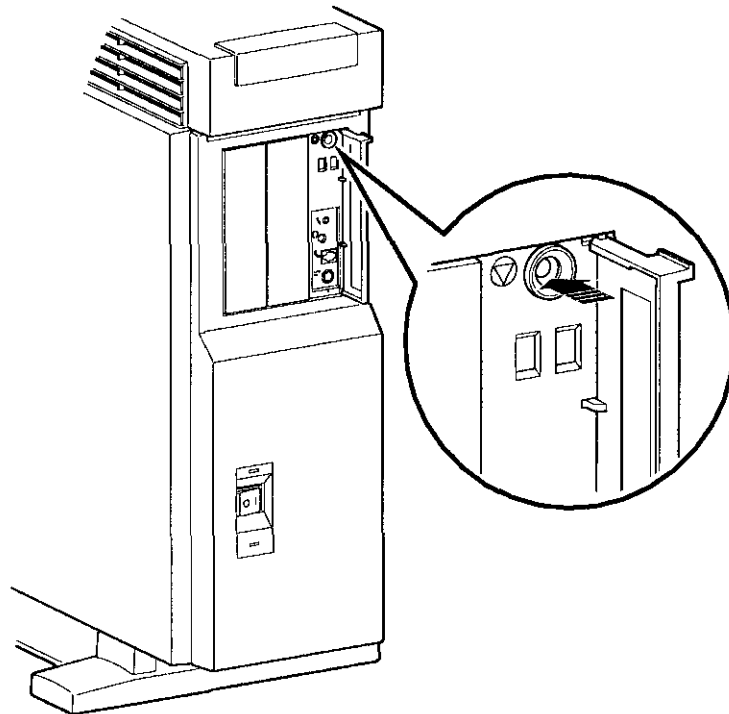
The procedure for shutting down your software will depend on whether or not your system is networked.

| 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. |

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 dev Display

If you are adding one or more drives, enter the show dev command to show the drives installed in the system and their status. You should get a display similar to what is shown in Example 2-1.

Example 2-1 The show dev Display

| BOOTDEV | ADDR | DEVTYPE | NUMBYTES | RM/FX | WP | DEVNAM | REV |
|------------|-------------------|---------|----------|-------|----|--------|------|
| ----- | ---- | ----- | ----- | ----- | -- | ----- | --- |
| ESAO | 08-00-2B-1D-1E-EF | THICK | | | | | |
| DKA0 | A/0/0 | DISK | 1.05MB | 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/6 | INTR | | | | | |
| ..HostID.. | B/6 | INTR | | | | | |

>>>

How to Read the show dev Display

You should see the SCSI address for each drive in the ADDR column, as shown in Example 2-1. 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/6 indicates the initiator (SCSI controller) for the SCSI-B (external device) bus.

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.

Displaying the Configuration

If your display shows many lines with the same address in the ADDR column, two or more drives may have been installed with the same SCSI address, and you will need to change the SCSI address settings to ensure that each drive has a unique address.

The show mem Display

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

Example 2-2 The show mem Display

```
DEC 3000 - M500 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 mem Display

Example 2-2 shows an example of the display resulting from the show mem command. In this example, banks 0 and 1 each contain 32 megabytes of memory (four 8 megabyte modules). All other banks contain 0 megabytes, therefore, 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.

**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.

Example 2-3 shows an example of the display resulting from the show config command.

Example 2-3 The show config Display

```

DEC 3000 - M500/500S
Digital Equipment Corporation
VPP PAL X5.12-82000101 - Built on 8-NOV-1992 00:00:00.00

TCINFO      DEVNAM      DEVSTAT
-----      -
              CPU      OK KN15-AA V1.0-QZ-003AA-sv1.0 - DECchip 21064
              ASIC     OK
              MEM     OK
8
              CXT     OK
7
              NVR     OK
              SCC     OK
              NI      OK
              ISDN    OK
6
              SCSI    OK
3-PMAGB-BA   TC3
1-PMAG-FA    TC1
>>>
    
```

**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 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.

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 Example 2-3, a PMAGB-BA module is installed in slot 3, and a PMAG-FA 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 Example 2-4, follow these steps:

1. Use the show error command, as shown in Example 2-4, and note the FRU and error numbers. In this example, the FRU is 003, and the error number is 0050. 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 AXP Model 500/500S Owner's Guide*. It will explain how to contact your Digital service representative.

See Chapter 11 for information on testing TURBOchannel options.

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



Example 2-4 The show config Display with Error

```
DEC 3000 - M500
Digital Equipment Corporation
VPP PAL X5.12-82000101/OSF PAL X1.09-82000201 - Built on 8-SEP-1992
```

| TCINFO | DEVNAM | DEVSTAT |
|------------|--------|--|
| ----- | ----- | ----- |
| | CPU | OK KN15-AA V1.0-QZ-003AA-sv1.0 - DECchip 21064 |
| | ASIC | OK |
| | MEM | OK |
| 8 | | |
| | CXT | OK |
| 7 | | |
| | NVR | OK |
| | SCC | ? 60 |
| | NI | OK |
| | ISDN | OK |
| 6 | | |
| | SCSI | OK |
| 3-PMAGB-BA | TC3 | |
| 1-PMAG-FA | TC1 | |

```
>>> show error
?? 004 SCC 0x0060
>>>
```

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.)

CAUTION: Component Damage

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

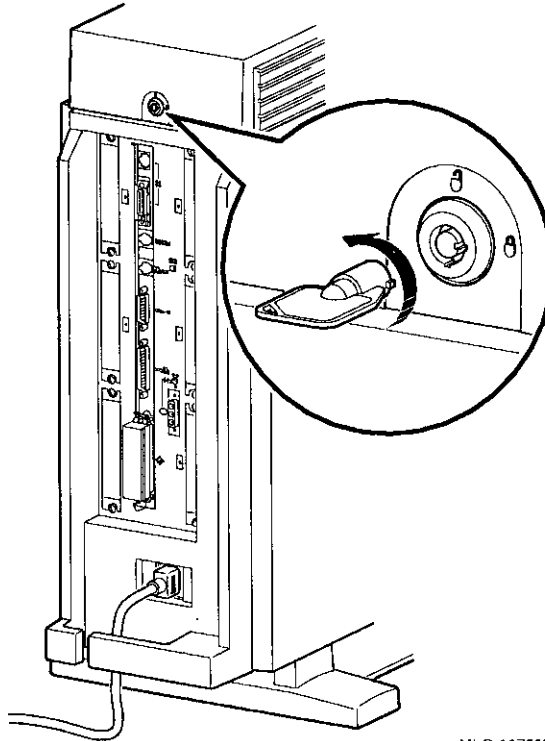
Depending on the options you plan to add, you may not need to remove all panels. Read the instructions for removing each panel to determine whether or not you need to remove that panel.

To remove the panels, follow these steps:

Step 1: Unlock Cover

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

Figure 2-2 Unlocking the System Cover



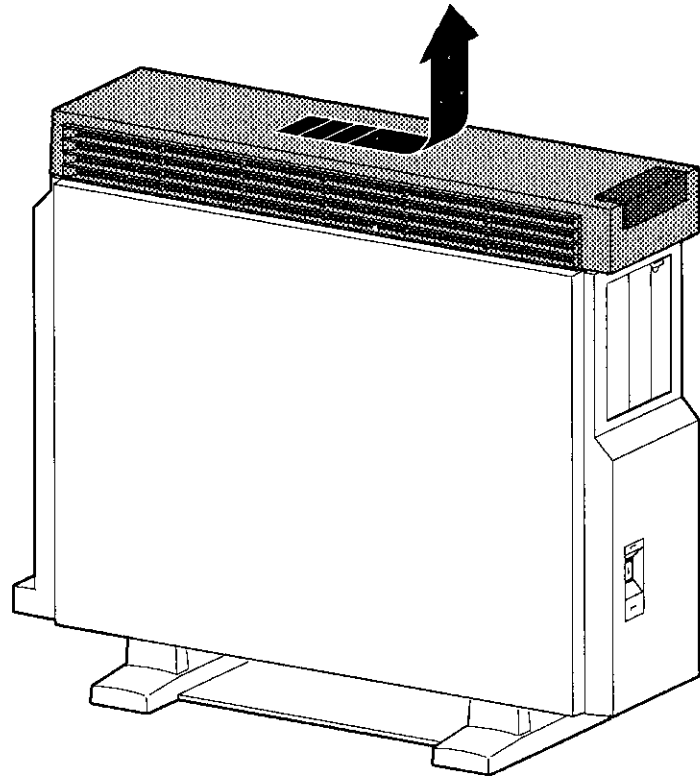
MLO-007502

Removing Panels

Step 2: Remove Cover

Remove the system cover by sliding it forward and lifting it off, as shown in Figure 2-3. Note that the cover must be removed before you can remove the front panel or either side panel.

Figure 2-3 Removing the System Cover



MLO-007503



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

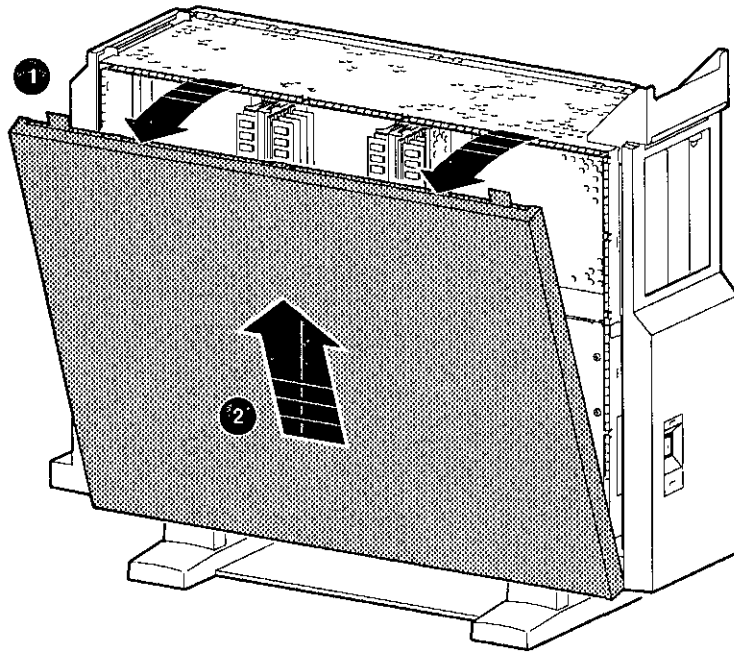
To avoid damage from static discharge after removing the side panels and before touching anything inside the system, wear an antistatic wrist strap. For information on using an antistatic wrist strap, see *Using an Antistatic Wrist Strap*, later in this chapter.

Removing Panels

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 2-4. Do *not* pull on the plastic part of the panel. (TURBOchannel options may be installed in either the left or right side.)

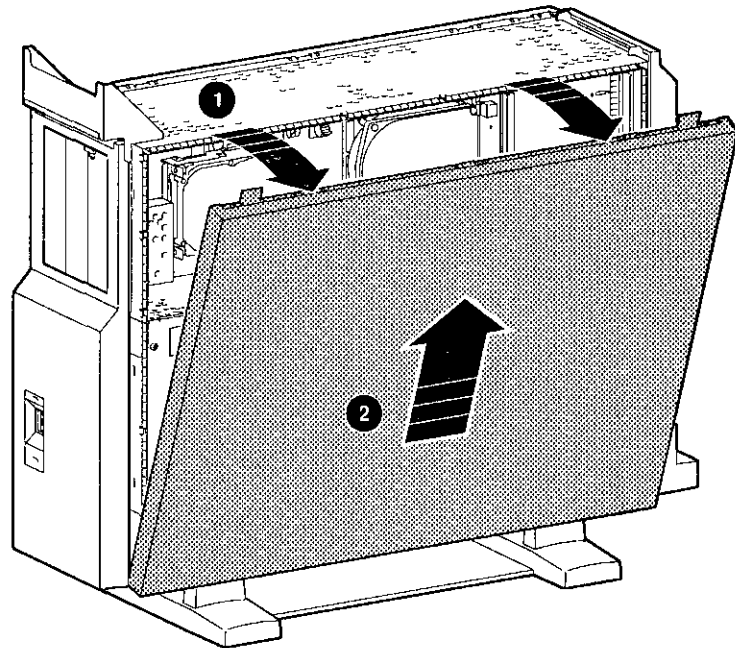
Figure 2-4 Removing the Left Side Panel



MLO-007504

**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 2-5. Do *not* pull on the plastic part of the panel. (TURBOchannel options may be installed in either the left or right side.)

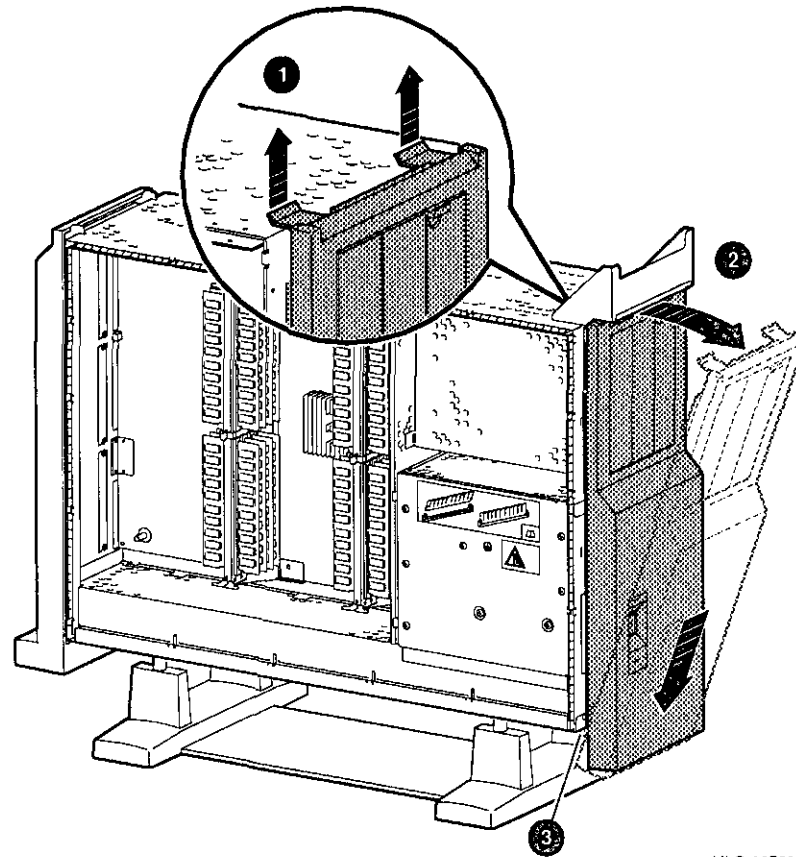
Figure 2-5 Removing the Right Side Panel

MLO-007505

**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, and unhooking the panel bottom, as shown in Figure 2-6.

Figure 2-6 Removing the Front Panel



MLO-007506



Using an Antistatic Wrist Strap

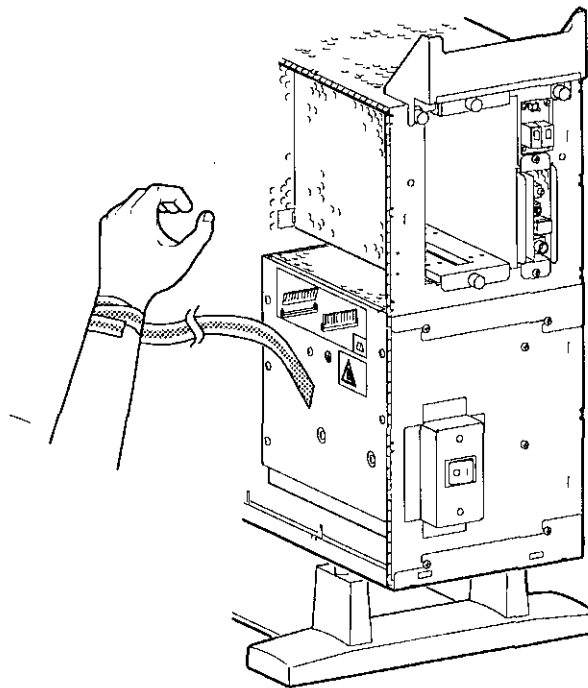
CAUTION:
Component
Damage

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 2-7.

Figure 2-7 Using the Antistatic Wrist Strap



MLO-007598

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 add... | See... |
|--------------------------|------------|
| RRD42 Compact Disc Drive | Chapter 3 |
| RX26 Diskette Drive | Chapter 4 |
| TZK10 Tape Drive | Chapter 5 |
| TLZ06 Tape Drive | Chapter 6 |
| RZ25 Fixed Disk Drive | Chapter 7 |
| RZ26 Fixed Disk Drive | Chapter 8 |
| Memory modules | Chapter 9 |
| TURBOchannel modules | Chapter 10 |

RRD42 Compact Disc 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
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

Chapter Overview

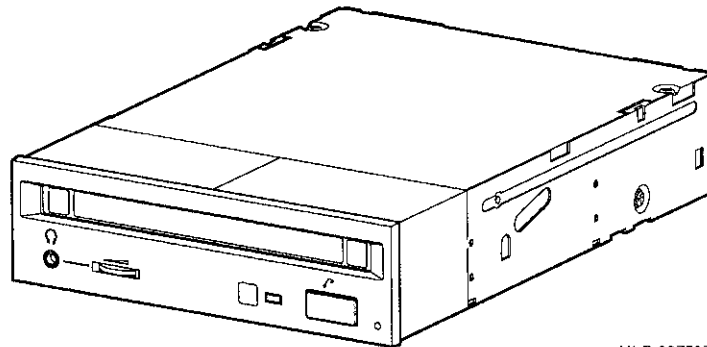
This chapter covers the following topics:

- Description of the RRD42 Drive
- Configuring the RRD42 Drive
- Installing the RRD42 Drive
- Using the RRD42 Drive
- RRD42 Drive Specifications

Description of the RRD42 Drive

- Capacity** The capacity of the RRD42 drive is 600 megabytes.
- Purpose** The RRD42 drive can be used for:
- Installation of the operating system and other software
 - Access to read-only databases, such as online documentation
- Audio Output** External audio output for the RRD42 drive is through a headphone jack.
- Illustration** The RRD42 drive is shown in Figure 3-1.

Figure 3-1 RRD42 Compact Disc Drive



MLO-007507

Configuring the RRD42 Drive

Setting Jumpers

Before using the RRD42 drive, configure the drive, that is, set the mode and SCSI address jumpers for the desired operating system and SCSI address. Jumpers are removable electrical connectors. See Figure 3-2 for the location of these jumpers.

Selecting Operating System

The mode jumper allows the drive to work with your operating system. The jumper must be in place for both OpenVMS and DEC OSF/1 operating systems.

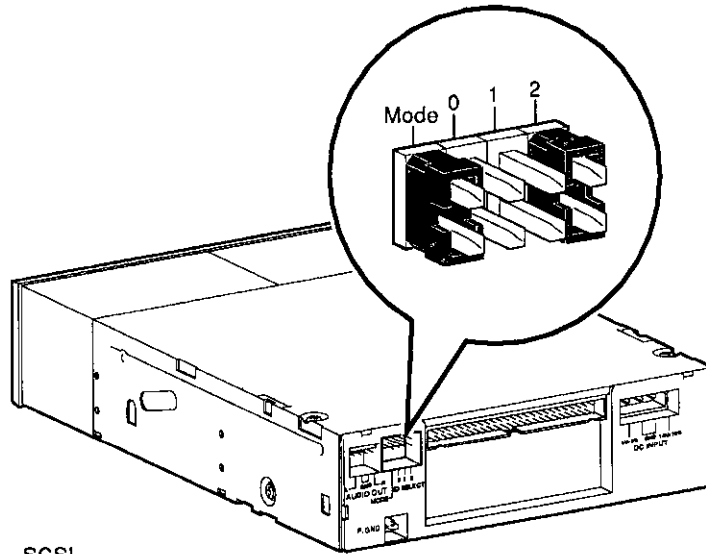
Selecting SCSI Address

SCSI jumpers allow selection of a unique address for each SCSI drive. Figure 3-2 shows jumper settings for all SCSI addresses, including the recommended address of 4. If using only one RRD42 drive, use the SCSI address of 4. If using more than one RRD42 drive, you will need to select a unique SCSI address for each additional drive.

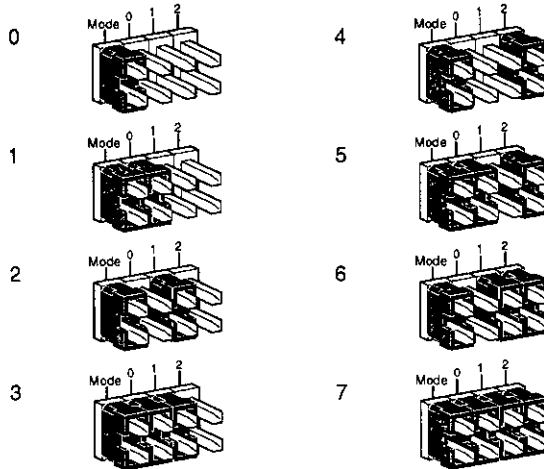
Default settings should be changed when a system is configured with more than one of a particular drive.

To change the default address, choose a new one from Figure 3-2, and carefully remove or replace jumpers accordingly, using tweezers or another small tool. Save any SCSI jumpers you remove. You may need them later.

Figure 3-2 RRD42 Mode and SCSI Address Jumpers



SCSI
Address
Settings: 0



MLO-007508

**IMPORTANT:
Unique SCSI
Address**

Each drive must have a unique SCSI address. Never set two or more drives to the same SCSI address; the system will not be able to communicate with the drives.

Installing the RRD42 Drive

Overview

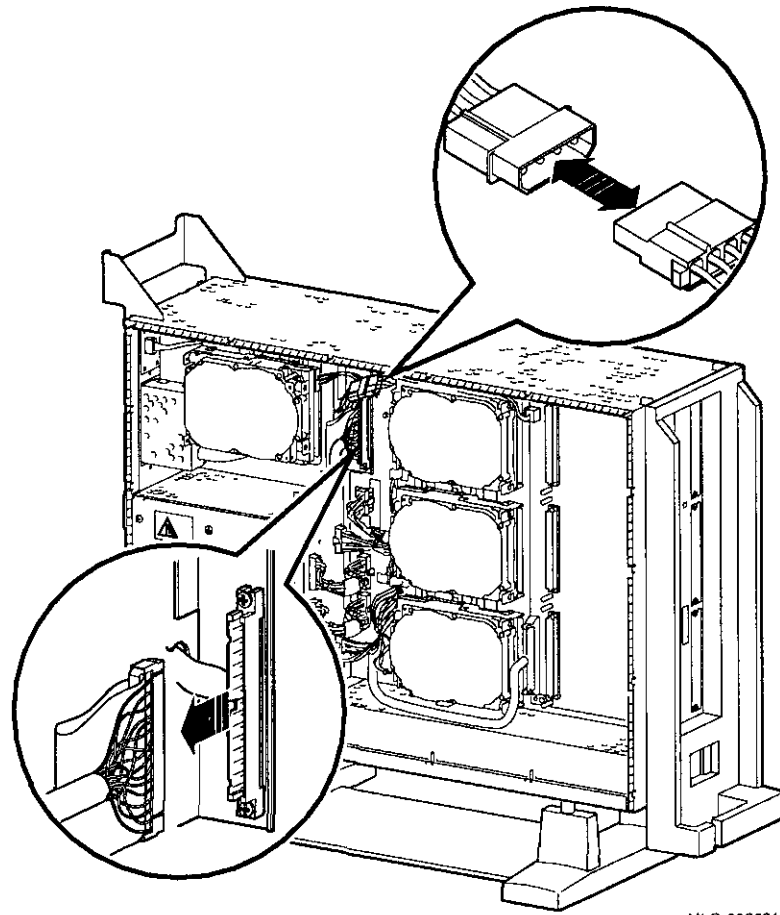
The RRD42 drive is installed in a bracket in the front of the system unit. The following steps tell you how to remove the bracket from the system unit, install the drive in the bracket, install drive cables, and place the bracket (with drive) back into the system unit.

To install an RRD42 drive, follow these steps:

Step 1: Remove Cables from System

Disconnect the bracket power and SCSI cables on the right side of the system, as shown in Figure 3-3. The bracket power and SCSI cables are shown in Figure 3-5 and Figure 3-6.

Figure 3-3 Disconnecting Bracket Power and SCSI Cables



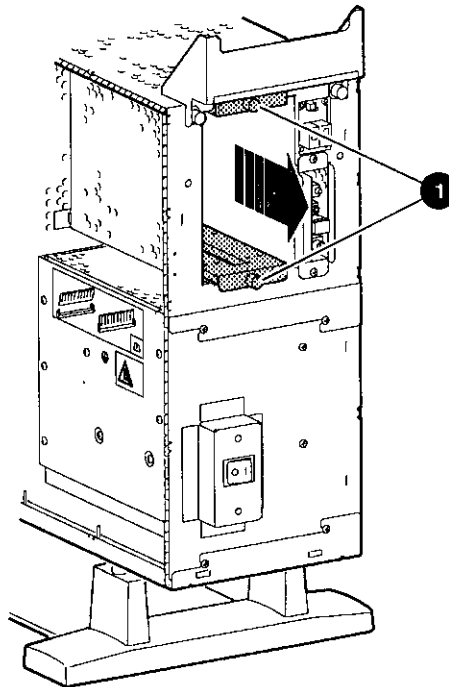
MLO-008591



**Step 2:
Remove
Bracket**

Remove the drive bracket from the system by releasing the two thumbscrews ❶, as shown in Figure 3-4 and pulling the bracket straight out. The thumbscrews will pop out a little when they are fully loosened. If the thumbscrews are too tight, loosen the screws in the center of the thumbscrews.

Figure 3-4 Removing the Drive Bracket

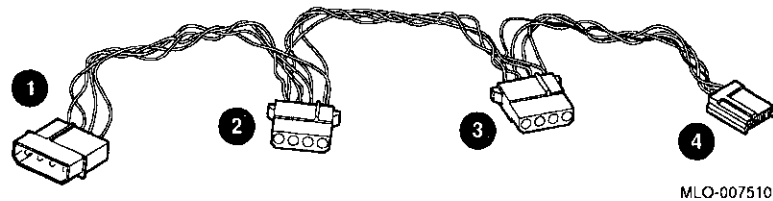


MLO-007509

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

Each cable has several connectors. Refer to Figure 3-5 and Figure 3-6 when making cable connections.

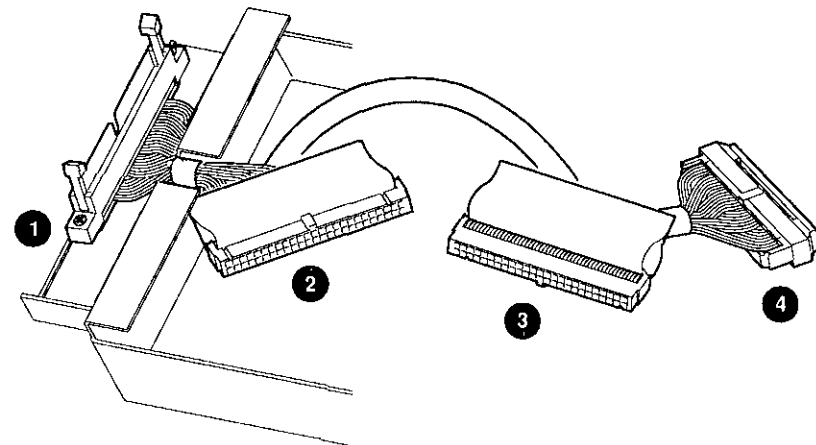
Figure 3-5 Bracket Power Cable Connectors



MLO-007510

- ① to system power harness
- ② to RRD42 drive power port
- ③ not used for this drive
- ④ not used for this drive

Figure 3-6 Bracket SCSI Cable Connectors



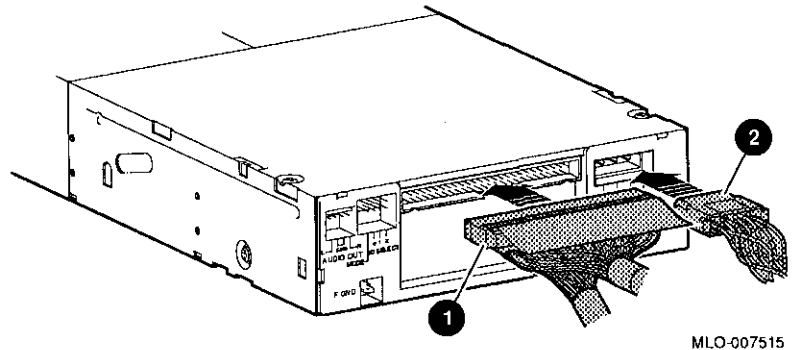
MLO-009887

- ① to system SCSI bus
- ② not used for this drive
- ③ to RRD42 drive SCSI port
- ④ terminator

**Step 4:
Connect Cables
to Drive**

Connect the SCSI ❶ and power ❷ cables to the ports on the rear of the drive, as shown in Figure 3-7. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive ports.

Figure 3-7 Connecting Cables to the RRD42

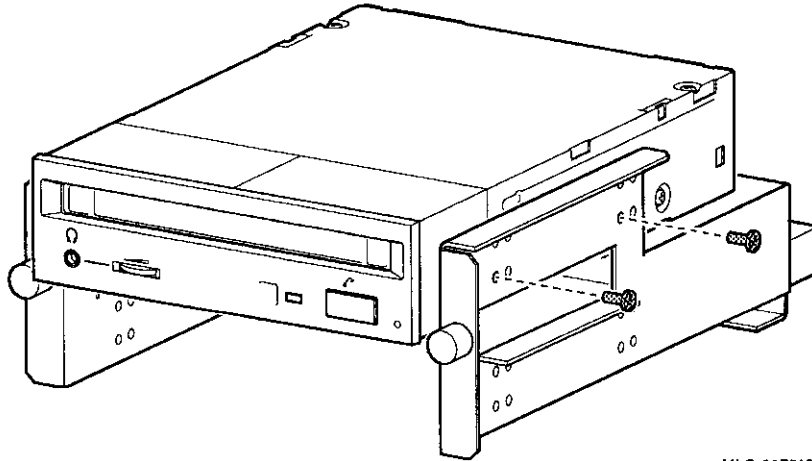


MLO-007515

**Step 5: Place
Drive In
Bracket**

Place the RRD42 drive in the bracket, as shown in Figure 3-8, and secure it with two screws on each side.

Figure 3-8 Placing the Drive into the Bracket



MLO-007513

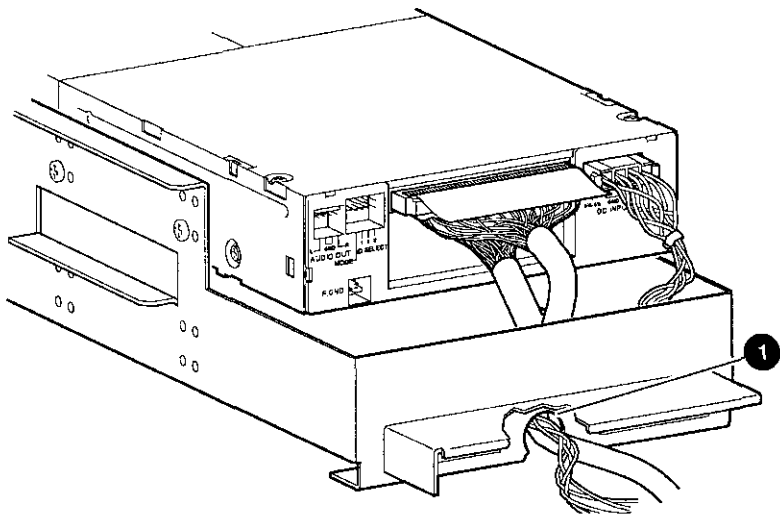
**Determining
Position in
Bracket**

There are two drive positions for the bracket. Mount the RRD42 drive in the upper position, as shown in Figure 3-8, so that it will be on the left after the bracket is re-installed. If a drive other than another RRD42 drive occupies this upper position, move the other drive to the lower position.

**Step 6:
Position Cables**

Slip the power and SCSI cables into the slot ❶ in the rear of the bracket, as shown in Figure 3-9.

Figure 3-9 Slipping Cables into Slot



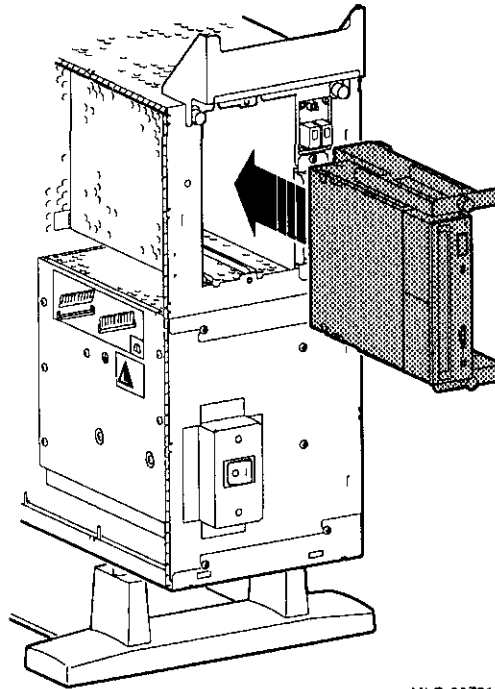
MLO-009392

Installing the RRD42 Drive

Step 7: Slide Bracket into System

Slide the bracket partly into the system, as shown in Figure 3-10.

Figure 3-10 Sliding the Bracket into the System

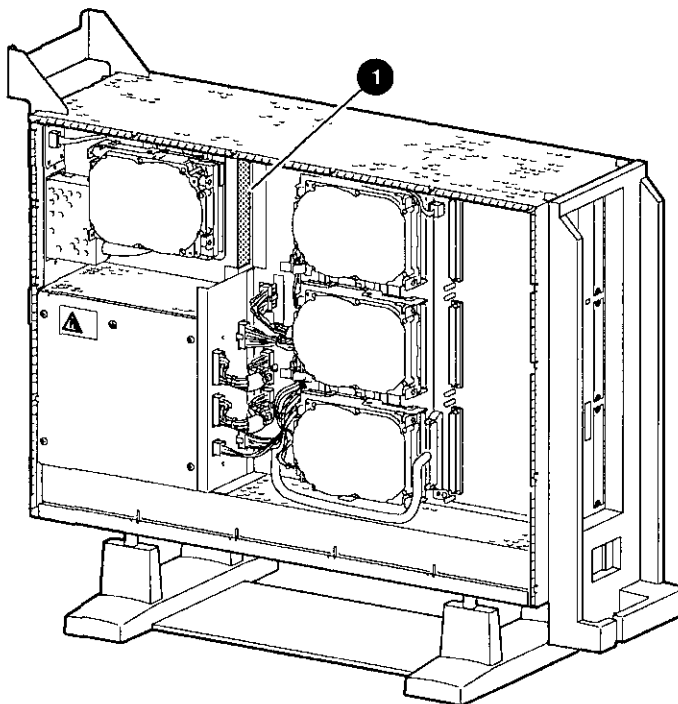


MLO-007514

**Step 8: Guide
Bracket Power
Cable**

Guide the bracket power cable through the opening ❶ into the right side of the system, as shown in Figure 3–11.

Figure 3–11 Bracket Power Cable Opening

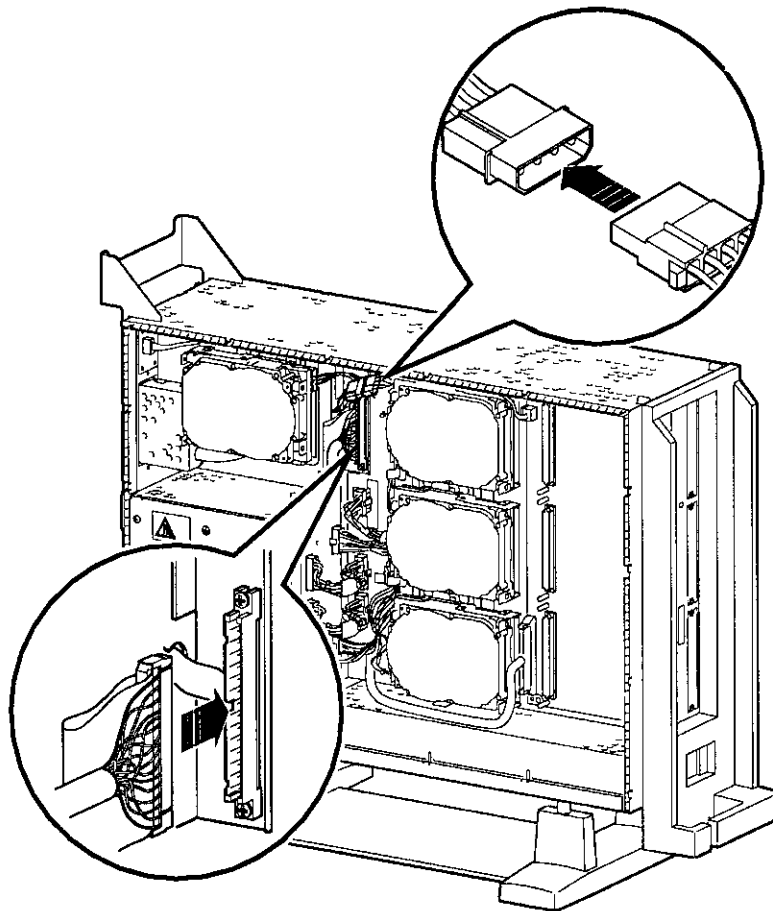


MLO-008590

**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 3-12.

Figure 3-12 Connecting Cables to the System



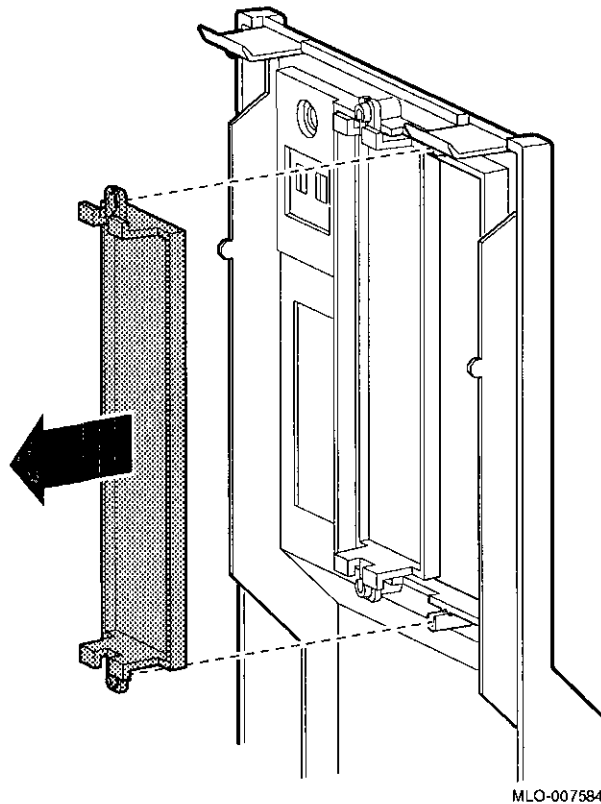
**Step 10:
Tighten
Thumbscrews**

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

**Step 11:
Remove Blank
Bezel**

Remove the blank bezel from the front panel, as shown in Figure 3-13. This bezel is on the *left* as you face the front of the panel.

Figure 3-13 Removing the Blank Bezel from the Front Panel



MLO-007584

Completion

This completes installation of the RRD42 compact disc drive.

**Where to Go
from Here**

| If you... | Then... |
|--|---|
| Have other options to add inside the system, | turn to the appropriate chapter. |
| Have <i>no</i> other options to add inside the system, | refer to Chapter 11 to replace the panels and check the system. |

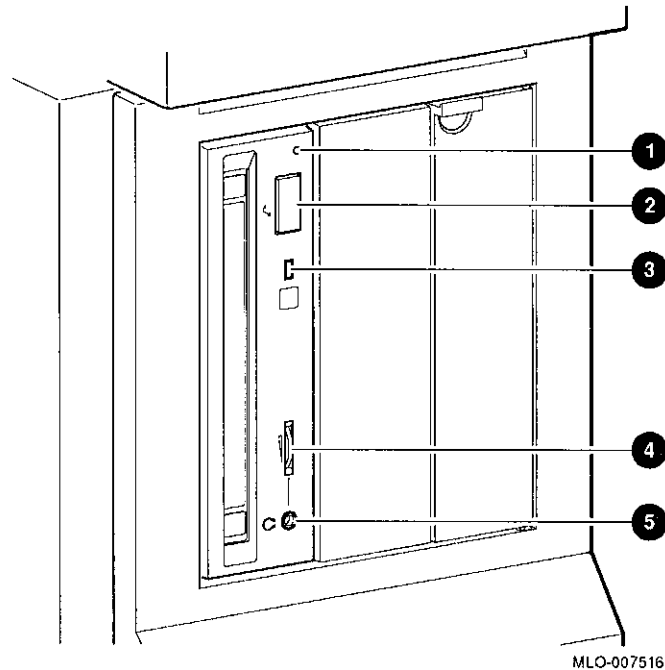


Using the RRD42 Drive

RRD42 Controls and Indicators

Figure 3-14 shows the RRD42 compact disc drive controls and indicators.

Figure 3-14 RRD42 Drive Controls and Indicators



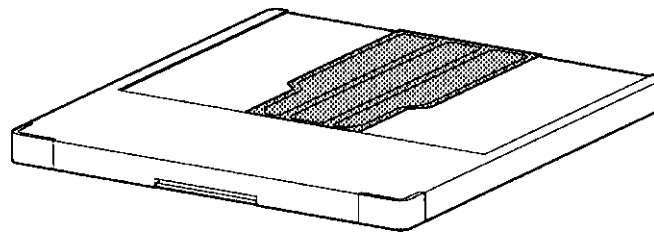
- ① Manual Eject Hole
- ② Eject Button
- ③ Busy Indicator Light
- ④ Headphone Volume Control
- ⑤ Headphone Jack

Handling and Storing Discs and Caddies

When handling and storing RRD42 discs and caddies:

- Do not drop or strike the disc or the caddy.
- Do not disassemble the caddy.
- Store discs and caddies away from dust.
- Keep discs and caddies out of direct sunlight and away from heaters and other heat sources. Store discs and caddies at a constant temperature between 10°C and 40°C (50°F and 104°F), and where the relative humidity is between 10% and 90%.
- Do not touch the surface of a disc. Handle a disc by its edges.
- Wipe a disc with a compact disc cleaner when dust or fingerprints contaminate its surface.
- Never manually open the caddy shutter, shown in Figure 3-15, or touch the disc. The caddy shutter opens automatically when you insert the caddy into the drive.

Figure 3-15 Caddy Shutter



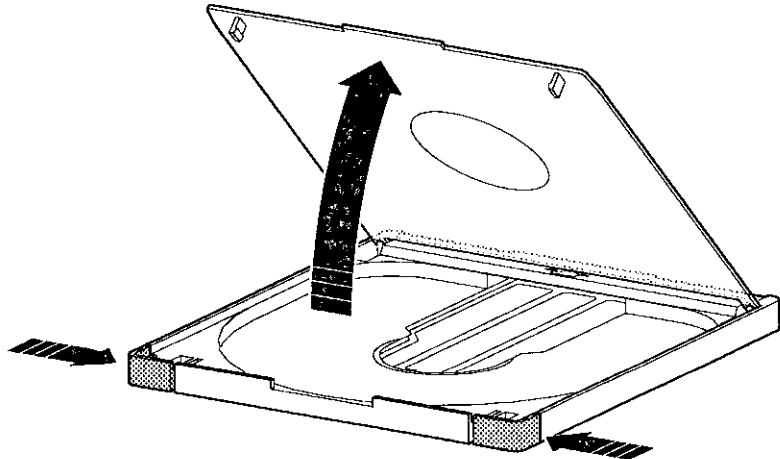
MLO-007517

Loading a Compact Disc into a Caddy

To load a disc into a caddy, follow these steps:

1. Open the caddy by pressing the tabs on both sides of the caddy at the end opposite the shutter, as shown in Figure 3-16.

Figure 3-16 Opening the Compact Disc Caddy



MLO-007519

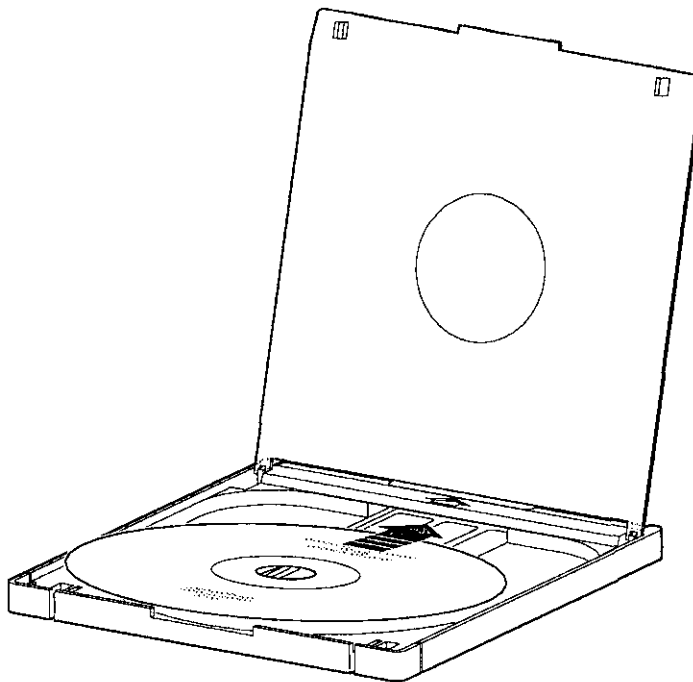
Using the RRD42 Drive

2. Set a disc, printed side up, into the caddy as shown in Figure 3-17.

CAUTION: Disc Damage

Do not touch the surface of a disc. Handle a disc by its edges. Fingerprints and dust may cause the disc to malfunction.

Figure 3-17 Loading a Compact Disc into a Caddy



MLO-007520

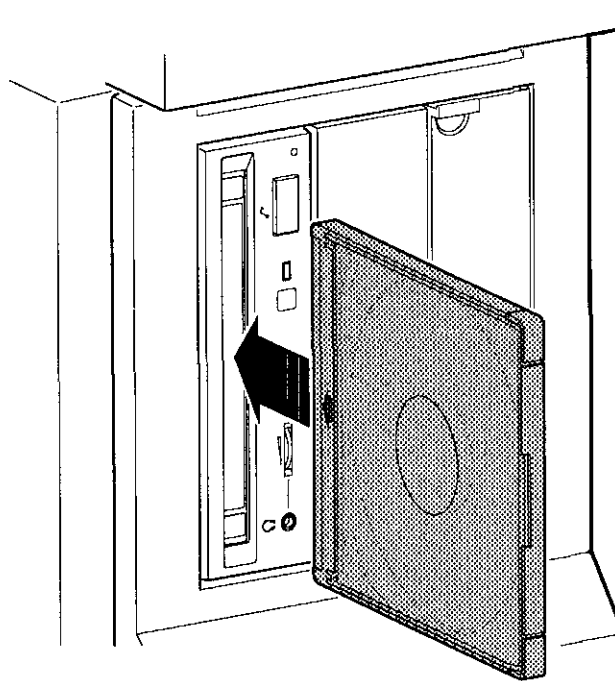
3. Press firmly on both corners to close the caddy lid.

Inserting a Loaded Caddy

To insert a loaded caddy, follow these steps:

1. Make sure that the system is on (|).
2. Insert the disc caddy into the drive with the caddy oriented as shown in Figure 3-18. Push the caddy into the drive as far as it will go. The caddy should be completely inside the drive when properly inserted.

Figure 3-18 Inserting a Loaded Caddy



MLO-007521

3. Check the busy indicator light. The busy indicator light comes on when the caddy has been inserted correctly.
The drive ejects the caddy if the enclosed disc is upside down, if the disc is improperly positioned in the caddy, or if any other conditions prevent the drive from reading the disc.
4. When the busy indicator light goes off, the compact disc drive is ready to use. To operate the compact disc drive, follow the instructions provided with the system software.

Removing a Disc Caddy

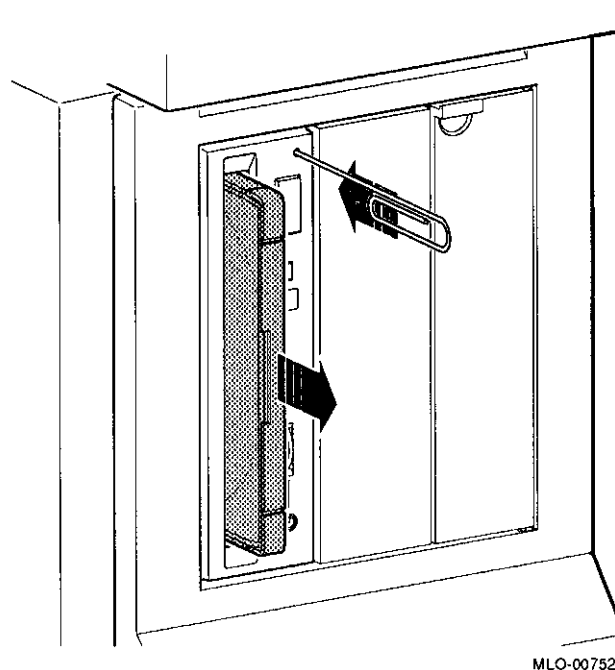
To remove a disc caddy, press the eject button shown in Figure 3-14.

The eject button will not work if it is disabled by the software. However, you can still remove the disc manually. To do so, you must shut off the system.

To remove a disc caddy manually:

1. See Chapter 2 for the procedure to shut down the operating system and hardware.
2. With the system power off, insert the end of a large paper clip into the manual eject hole, as shown in Figure 3-19, and push until the disc emerges from the drive.

Figure 3-19 Manually Removing a Caddy



RRD42 Drive Specifications

This section provides the following information:

- RRD42 Drive Weight and Dimensions
- RRD42 Drive Specifications
- RRD42 Drive Operating Conditions
- RRD42 Drive Nonoperating Conditions

Table 3-1 RRD42 Drive Weight and Dimensions

| Weight | Height | Width | Depth |
|---------------------|----------------------|----------------------|----------------------|
| 1.3 kg (2.87 lb) | 4.17 cm (1.63 in) | 14.6 cm (5.75 in) | 20.51 cm (8.0 in) |

Table 3-2 RRD42 Drive Specifications

| | |
|--------------------|---|
| Disc capacity | 600 MB (maximum) |
| Access time | Full stroke 650 msec (typical) Average (1/4 stroke) 380 msec (typical) |
| Data transfer rate | Sustained rate 150 KB/sec Burst rate 1.5 MB/sec |

Table 3-3 RRD42 Drive Operating Conditions

| | |
|------------------------------------|---------------------------------|
| Maximum rate of temperature change | 10°C to 50°C (50°F to 122°F) |
| Temperature range ¹ | 5°C to 50°C (41°F to 122°F) |
| Relative humidity | 10% to 90%, noncondensing |
| Maximum wet bulb temperature | 29°C (84°F) |
| Minimum dew point temperature | 2°C (36°F) |
| Altitude | 2400 m (8000 ft) at 36°C (96°F) |

¹Reduce maximum temperature by 1.8°C (5.24°F) for each 1000-meter (3300-foot) increase in altitude.

Table 3-4 RRD42 Drive Nonoperating Conditions

| | |
|-------------------------------|-------------------------------------|
| Temperature range | -30°C to 55°C (-22°F to 131°F) |
| Relative humidity | 10% to 90%, noncondensing |
| Maximum wet bulb temperature | 46°C (115°F), packaged |
| Minimum dew point temperature | 2°C (36°F) |
| Altitude | 13,600 m (44,600 ft) at 36°C (96°F) |

RX26 Diskette 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
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

Chapter Overview

This chapter covers the following topics:

- Description of the RX26 Drive
- Setting SCSI Address
- Installing the RX26 Drive
- Using the RX26 Drive
- RX26 Drive Specifications

Description of the RX26 Drive

Capacity

The capacity of the RX26 drive is 2- or 4-megabytes, on 3½-inch diskettes. The capacity depends on the diskette density used. You can read from and write to 2- and 4-megabyte diskettes. You can also read from 1-megabyte standard 3½-inch diskettes.

Purpose

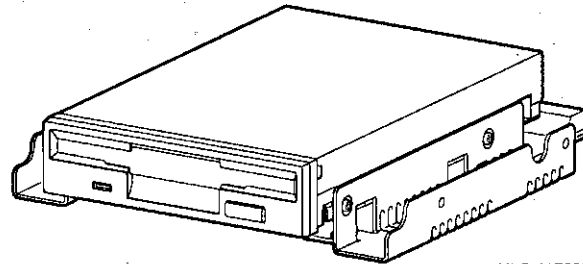
The RX26 diskette drive can be used for:

- Selective file backup
- Loading applications
- Transporting files between standalone systems

Illustration

The RX26 drive is shown in Figure 4-1.

Figure 4-1 RX26 Diskette Drive



MLO-007523

Setting SCSI Address

Address Switches

Before using the RX26 drive, check the SCSI address switches to ensure that they are set for the desired SCSI address. See Figure 4-2 for the location of these switches.

SCSI switches allow selection of a unique address for each SCSI drive. Figure 4-2 shows the switches set for all SCSI addresses, including the recommended address of 5.

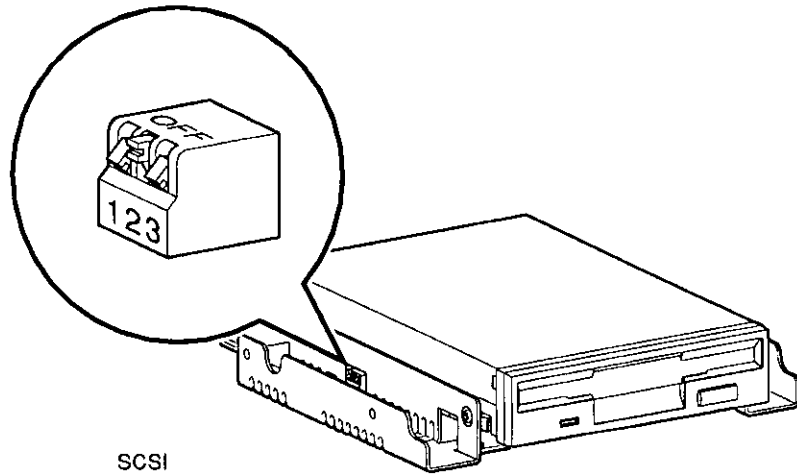
Default settings should be changed when a system is configured with more than one of a particular drive. The DEC 3000 AXP Model 500/500S is designed to operate with only one diskette drive, therefore, a change should not be necessary.

If you want to change the default address, choose a new one from Figure 4-2 and, using a small pointed instrument (such as the tip of a ball-point pen), set the switches accordingly.

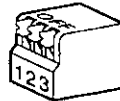
CAUTION: Switch Damage

Do not use a pencil to set the SCSI switches. Graphite particles can damage the switches.

Figure 4-2 RX26 SCSI Address Switches



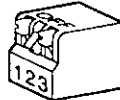
SCSI
Address
Settings: 0



1



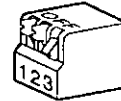
2



3



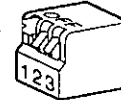
4



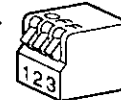
5



6



7



MLO-007524

**IMPORTANT:
Unique SCSI
Address**

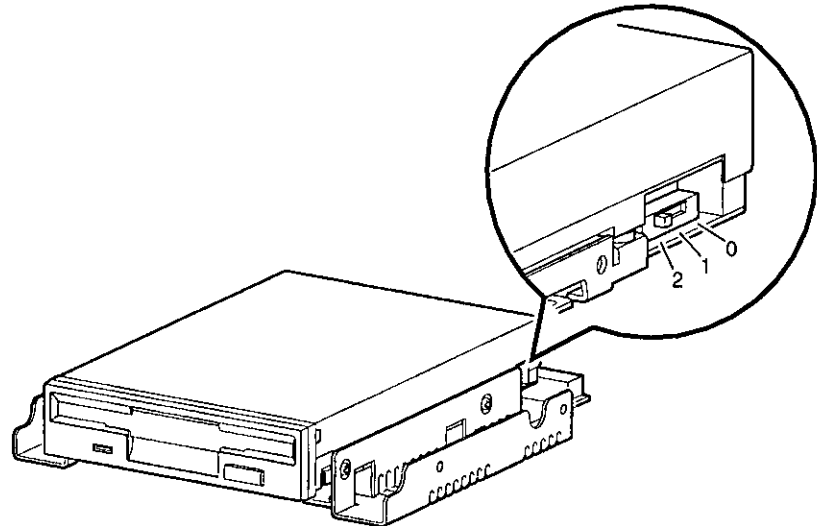
Each drive must have a unique SCSI address. Never set two or more drives to the same SCSI address; the system will not be able to communicate with the drives.



Setting the Unit Select Switch

Make sure that the unit select switch is set to 2, as shown in Figure 4-3.

Figure 4-3 RX26 Unit Select Switch



MLO-007561

Installing the RX26 Drive**Overview**

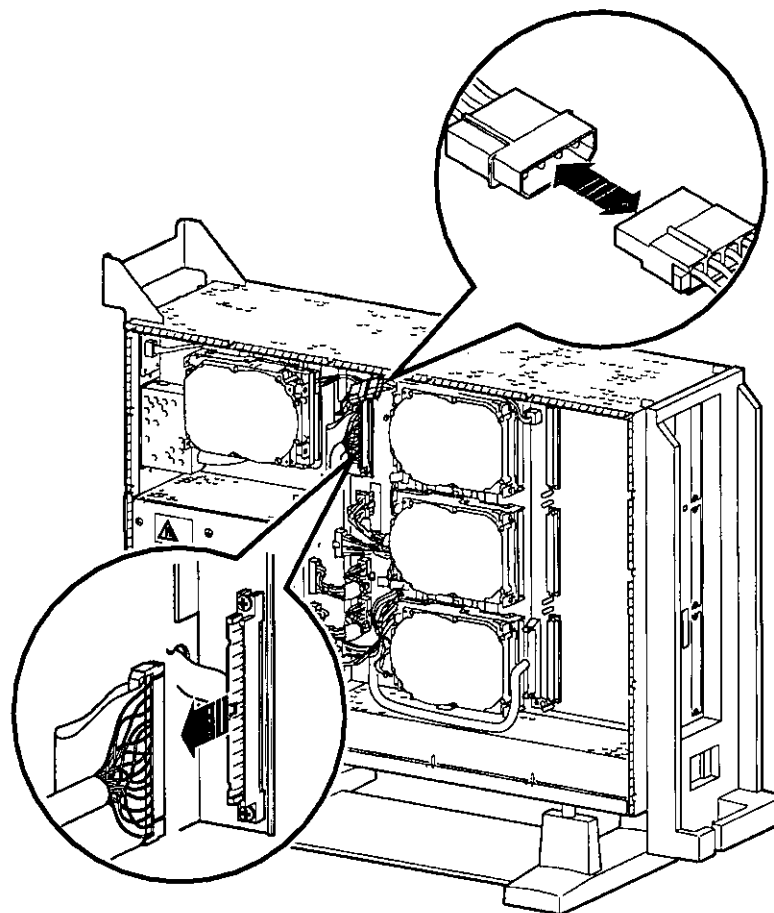
The RX26 drive is mounted in a bracket in the front of the system unit. The following steps tell you how to remove the bracket from the system unit, install the drive in the bracket, install drive cables, and place the bracket (with drive) back into the system unit.

To install an RX26 diskette drive, follow these steps:

**Step 1:
Remove Cables
from System**

Disconnect the bracket power and SCSI cables on the right side of the system, as shown in Figure 4-4. The bracket power and SCSI cables are shown in Figure 4-6 and Figure 4-7.

Figure 4-4 Disconnecting Bracket Power and SCSI Cables

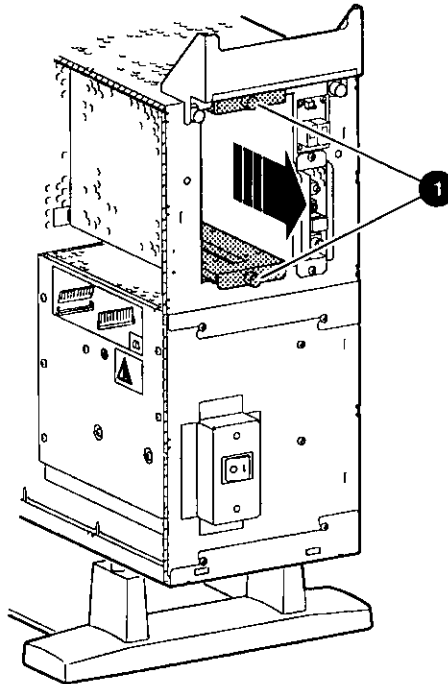


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**Step 2:
Remove
Bracket**

Remove the drive bracket from the system by releasing the two thumbscrews ❶, as shown in Figure 4-5, and pulling the bracket straight out. The thumbscrews will pop out a little when they are fully loosened. If the thumbscrews are too tight, loosen the screws in the center of the thumbscrews.

Figure 4-5 Removing the Drive Bracket

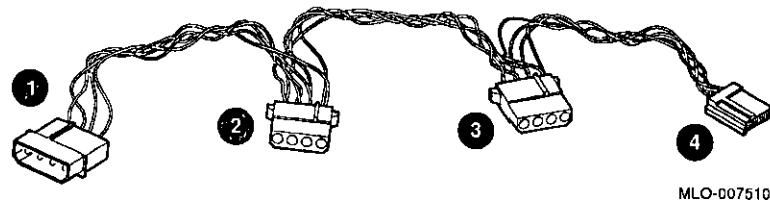


MLO-007509

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

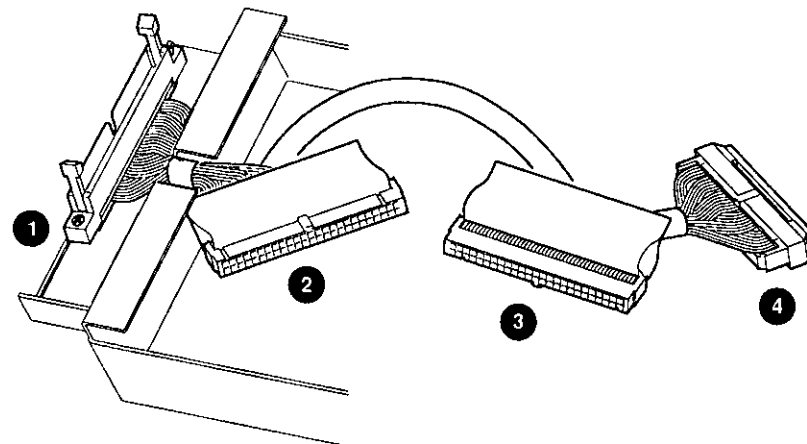
Each cable has several connectors. Refer to Figure 4-6 and Figure 4-7 when making cable connections.

Figure 4-6 Bracket Power Cable Connectors



- ❶ to system power harness
- ❷ not used for this drive
- ❸ to RX26 drive module power port
- ❹ to RX26 drive power port

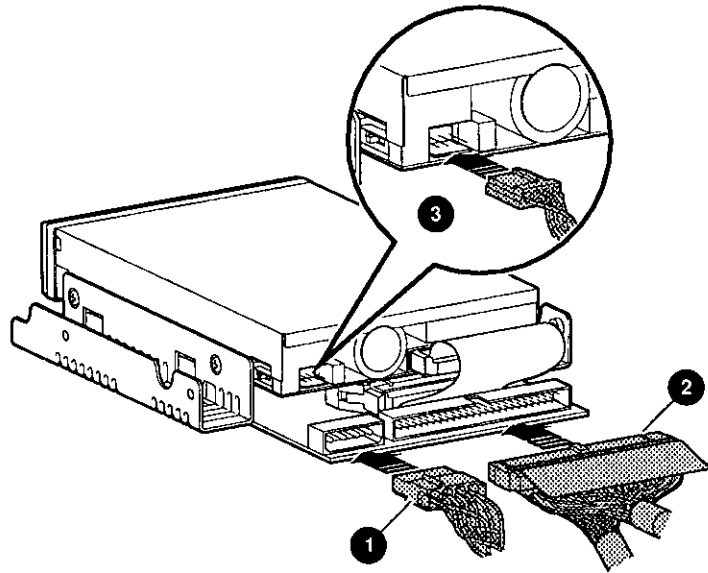
Figure 4-7 Bracket SCSI Cable Connectors



- ❶ to system SCSI bus
- ❷ to RX26 drive module SCSI port
- ❸ not used for this drive
- ❹ terminator

**Step 4:
Connect Cables
to Drive**

Connect the power ❶ and SCSI ❷ cables to the ports on the rear of the drive board, as shown in Figure 4-8. Connect the small power connector ❸ to the port on the rear of the drive, as shown in Figure 4-8. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive ports.

Figure 4-8 Connecting Cables to the RX26 Drive

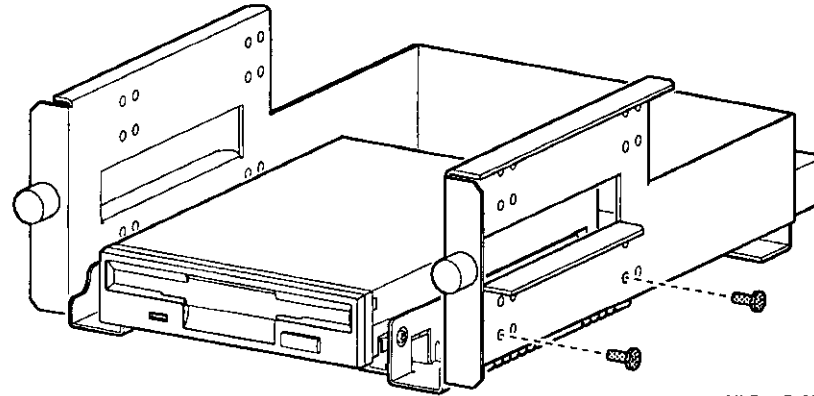
MLO-007525

Installing the RX26 Drive

Step 5: Place Drive in Bracket

Place the RX26 drive in the bracket, as shown in Figure 4-9, and secure it with two screws on each side.

Figure 4-9 Placing the Drive into the Bracket



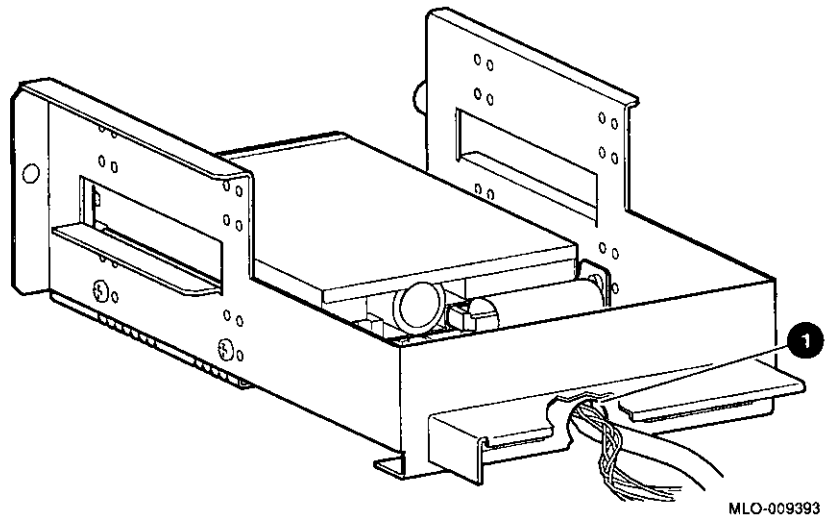
Determining Position in Bracket

The RX26 drive should be mounted in the lower position, as shown in Figure 4-9, so that it will be on the right after the bracket is re-installed. If another drive occupies this position, move the other drive to the upper position.

**Step 6:
Position Cables**

Slip the power and SCSI cables into the slot **1** in the rear of the bracket, as shown in Figure 4-10.

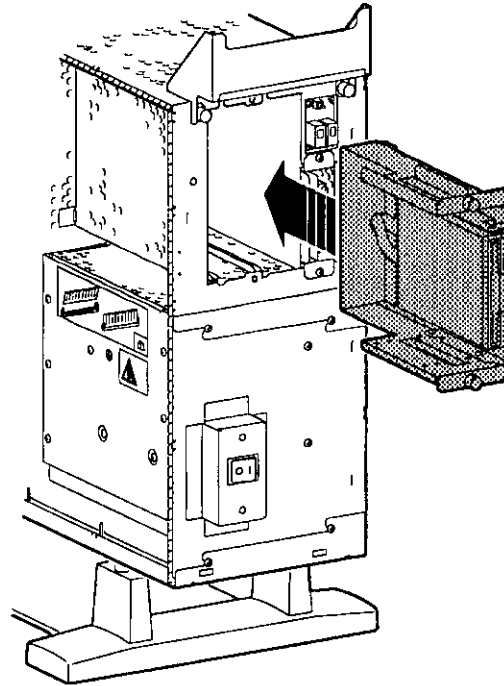
Figure 4-10 Slipping Cables into Slot



**Step 7: Slide
Bracket into
System**

Slide the bracket partly into the system, as shown in
Figure 4-11.

Figure 4-11 Sliding the Bracket into the System



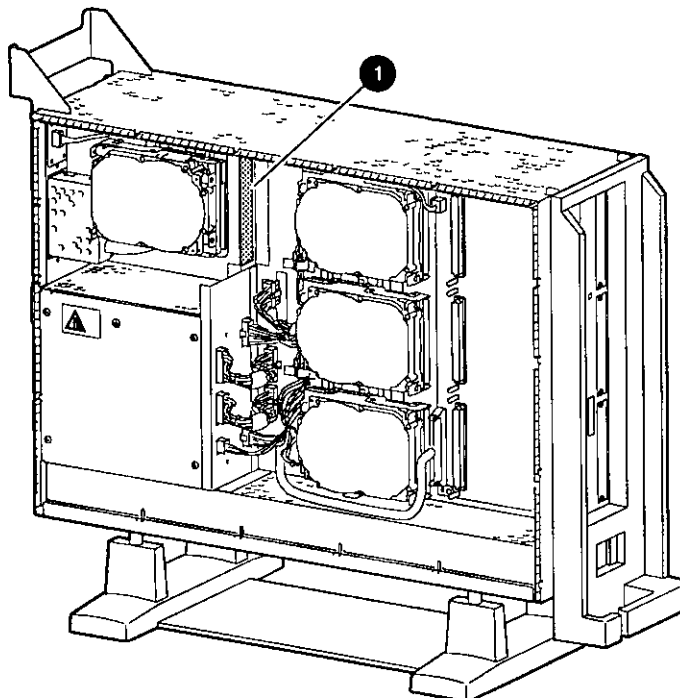
MLO-007527



**Step 8: Guide
Bracket Power
Cable**

Guide the bracket power cable through the opening ❶ into the right side of the system, as shown in Figure 4-12.

Figure 4-12 Bracket Power Cable Opening

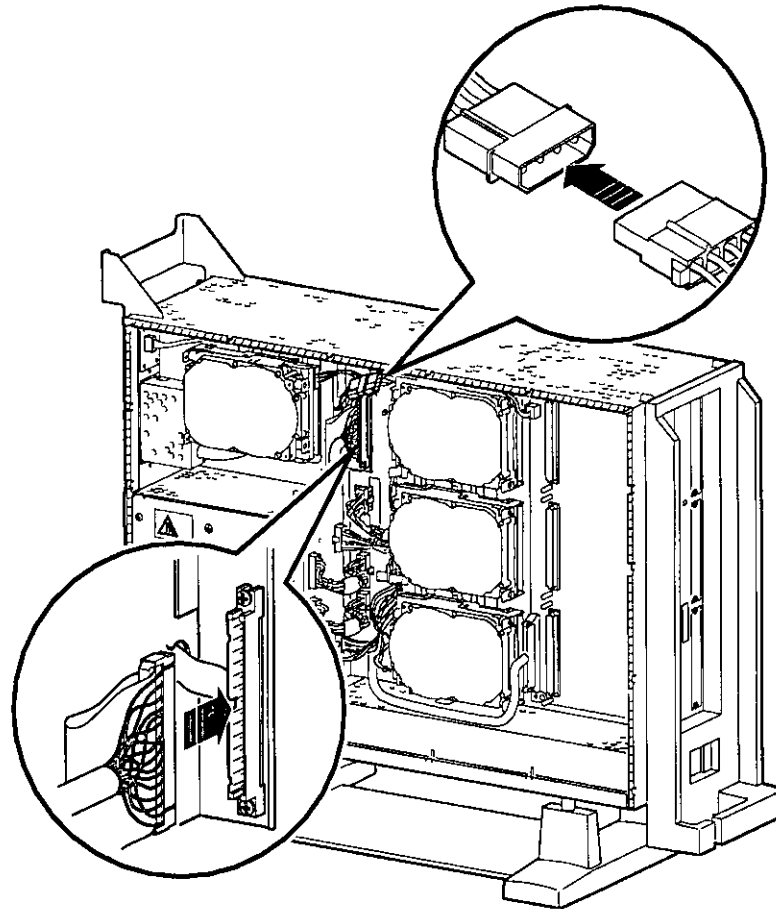


MLO-008590

**Step 9:
Connect Cables
to System**

Connect the bracket SCSI cable to the SCSI bus connector, and the power cable to the power harness, as shown in Figure 4-13.

Figure 4-13 Connecting Cables



MLO-007512

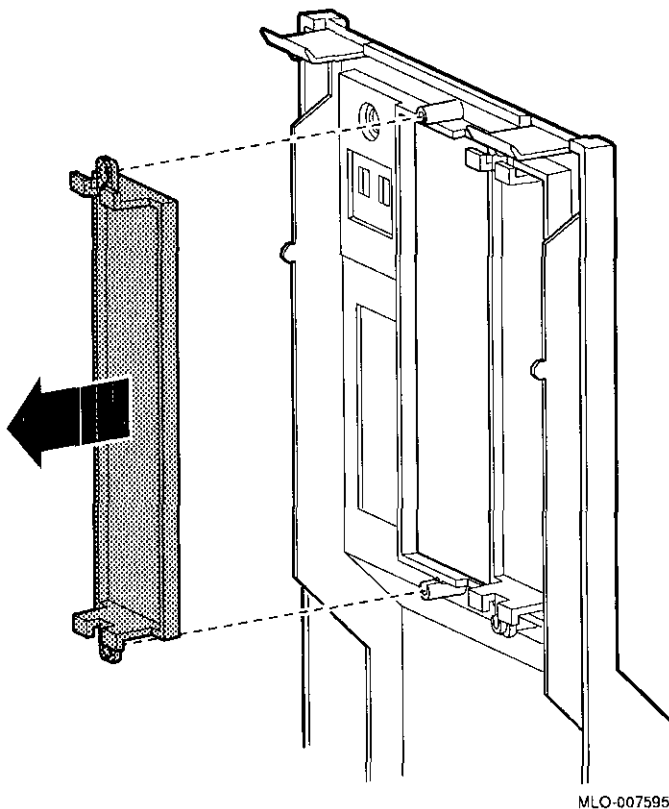
**Step 10:
Tighten
Thumbscrews**

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

**Step 11:
Remove Blank
Bezel**

Remove the blank bezel from the front panel, as shown in Figure 4-14. This bezel is on the *right* as you face the front of the panel.

Figure 4-14 Removing the Blank Bezel from the Front Panel

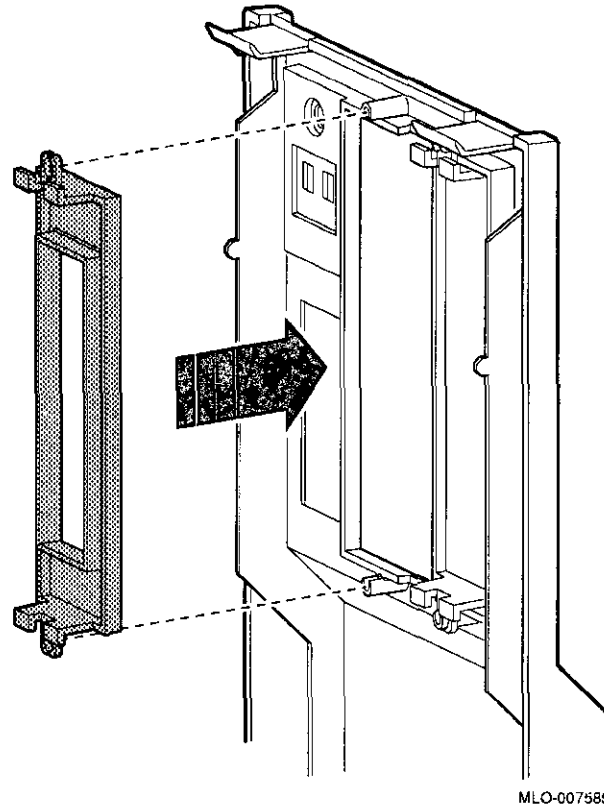


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**Step 12: Install
RX26 Bezel**

Install the RX26 bezel in the front panel, as shown in
Figure 4-15.

Figure 4-15 Placing the RX26 Bezel in the Front Panel



Completion

This completes installation of the RX26 diskette drive.

**Where to Go
from Here**

| If you... | Then... |
|--|---|
| Have other options to add inside the system, | turn to the appropriate chapter. |
| Have <i>no</i> other options to add inside the system, | refer to Chapter 11 to replace the panels and check the system. |

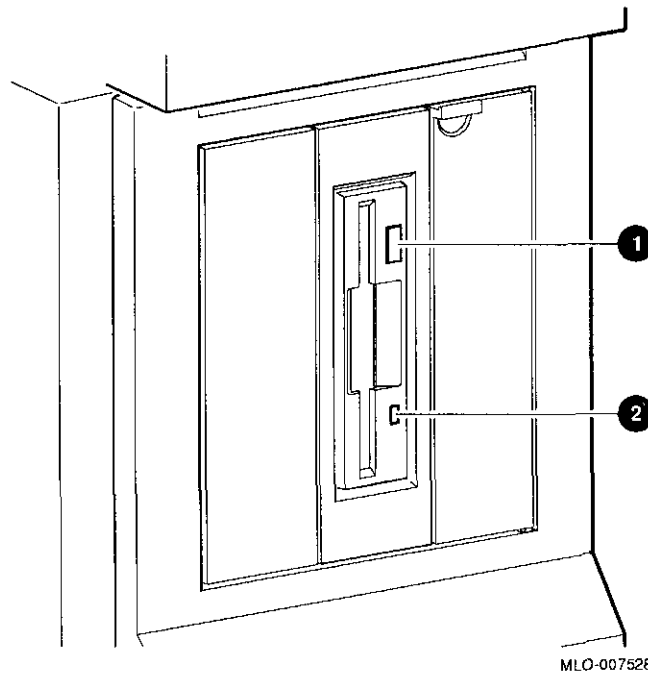


Using the RX26 Drive

RX26 Controls and Indicators

Figure 4–16 shows the RX26 eject button ❶ and busy indicator light ❷.

Figure 4–16 RX26 Controls and Indicators



CAUTION:
Diskette
Damage

When handling and storing RX26 diskettes:

- Keep the diskettes dry, out of extreme temperatures and direct sunlight.
- Keep the diskettes away from any equipment that contains a magnet, such as the monitor or a telephone.

The heat and electromagnetic field of the monitor can damage diskettes by distorting or erasing the magnetic data.

For further information, refer to the *RX26 Owner's Reference Card*, listed in Appendix A.

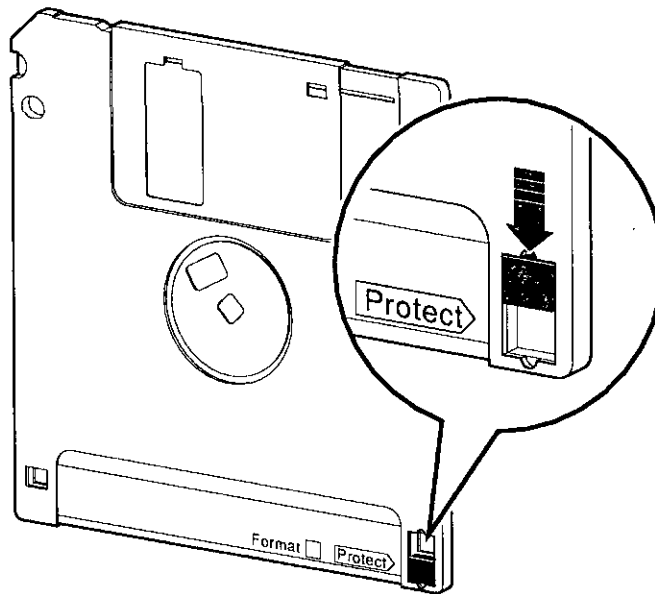
Write-Protecting
Diskettes

Write-protecting a diskette prevents accidental overwriting or erasure of data on the diskette. For example, if using a diskette to install software applications on the system, you may want to protect the information on the diskette.

Before using a diskette, check its write-protect switch. When the switch is in the Protect position, you can read information from the diskette, but cannot write to it.

To write-protect a diskette, move the write-protect switch down on the back of the diskette until it locks into place, as shown in Figure 4-17.

Figure 4-17 Write-Protecting a Diskette



MLO-007529

Writing to a Diskette

To write to a diskette, that is, to allow writing data on the diskette, slide the switch up on the back of the diskette until it locks into place.

CAUTION: Diskette Damage

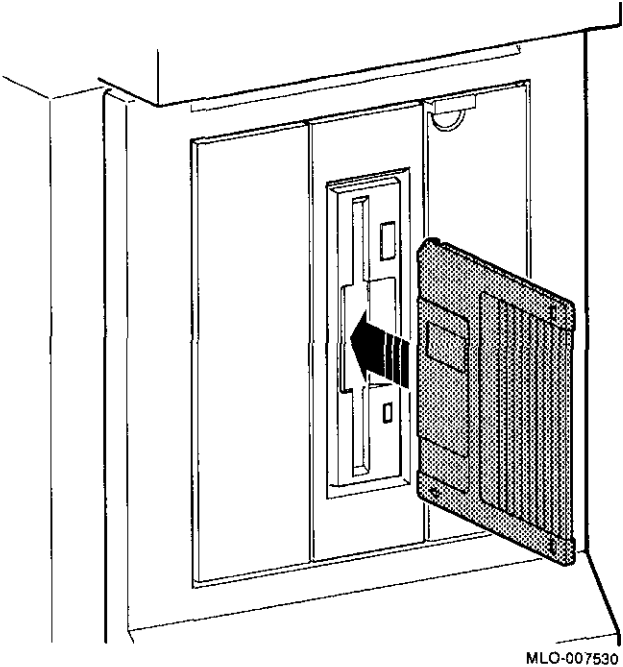
Never insert or remove a diskette when the diskette drive is in use (when the indicator light on the front of the drive is on); doing so can damage the diskette.

Inserting Diskettes

To insert a diskette into the diskette drive:

1. Make sure that the indicator light is off.
2. Slide the diskette into the drive, as shown in Figure 4-18. Note that the beveled corner is up. The diskette slides straight into its load position.
3. If you are using the OpenVMS operating system, refer to your operating system documentation for mounting instructions.

Figure 4-18 Inserting a Diskette

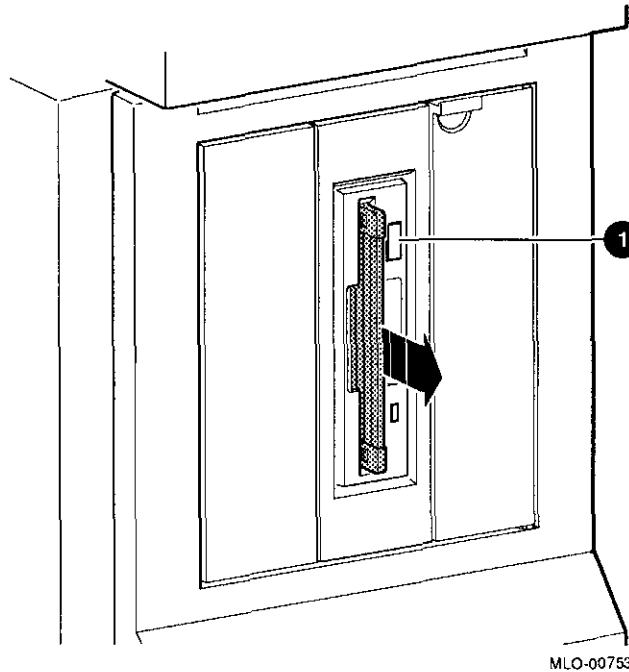


Removing Diskettes

To remove a diskette:

1. Make sure that the indicator light is off.
2. If you are using the OpenVMS operating system, refer to your operating system documentation for dismounting instructions.
3. Press the eject button ❶, as shown in Figure 4-19. When the diskette pops halfway out, pull the diskette out of the drive.

Figure 4-19 Removing a Diskette



RX26 Drive Specifications

This section contains the following information:

- RX26 Drive Weight and Dimensions (without side mounting brackets)
- RX26 Drive Specifications (formatted)
- RX26 Drive Operating Conditions
- RX26 Drive Nonoperating Conditions
- RX26 Diskette Specifications

Table 4-1 RX26 Drive Weight and Dimensions (without side mounting brackets)

| Weight | Height | Width | Depth |
|--------------------|----------------------|-----------------------|-----------------------|
| 425 g (0.94 lb) | 25.4 mm (1.00 in) | 101.6 mm (4.00 in) | 150.0 mm (5.91 in) |

Table 4-2 RX26 Drive Specifications (formatted)

| | |
|---------------------|---|
| Number of cylinders | 80 |
| Number of heads | 2 |
| Number of tracks | 160 |
| Capacity | 2.88 KB |
| Operating power | 1.25 watts (read/write) 4.60 watts (seeking) |
| Standby power | 0.30 watts |

Table 4-3 RX26 Drive Operating Conditions

| | |
|--------------------------------|-------------------------------------|
| Temperature range ¹ | °5C to 50°C (40°F to 122°F) |
| Temperature change rate | 11°C (20°F) per hour, maximum |
| Relative humidity | 8% to 80%, noncondensing |
| Maximum wet bulb temperature | 25.6°C (78°F) |
| Altitude | -300 to 3050 m (-1000 to 10,000 ft) |

¹Reduce maximum temperature by 1.8°C for each 1,000 meter (1.0°F for each 1,000 foot increase in altitude.)

Table 4-4 RX26 Drive Nonoperating Conditions

| | |
|------------------------------|---------------------------------------|
| Temperature range | -20°C to 66°C (-4°F to 151°F) |
| Relative humidity | 5% to 95%, noncondensing |
| Maximum wet bulb temperature | 46°C (115°F), packaged |
| Altitude | -300 to 12,200 m (-1000 to 40,000 ft) |

Table 4-5 RX26 Diskette Specifications

| Topic | Description |
|------------------|---|
| Diskette size | 3½ inches |
| Storage capacity | 4 MB unformatted, 2.9 MB formatted (ED) |
| | 2 MB unformatted, 1.4 MB formatted (HD) |
| | 1 MB unformatted, 720 KB formatted (DD) |

TZK10 Tape 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
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

Chapter Overview

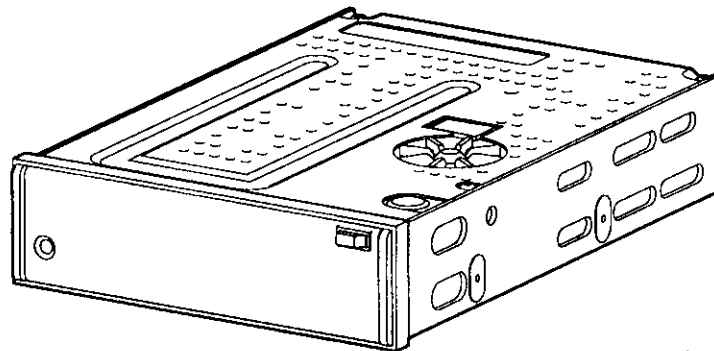
This chapter covers the following topics:

- Description of the TZK10 Drive
- Configuring the TZK10 Drive
- Installing the TZK10 Drive
- Using the TZK10 Drive
- TZK10 Drive Specifications

Description of the TZK10 Drive

- Capacity** The capacity of the TZK10 drive is 320 or 525 megabytes, depending on the tape used.
- Cartridges** The TZK10 tape drive can use any of the Digital tape cartridges listed in Table 5-6.
- Purpose** The TZK10 tape drive can be used for:
- File backup
 - Loading applications
- Illustration** The TZK10 tape drive is shown in Figure 5-1.

Figure 5-1 TZK10 Tape Drive



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Configuring the TZK10 Drive

Setting Jumpers

Before using the TZK10 drive, configure the drive, that is, check the DADS and DRIVE SELECT jumpers to make sure that they are set for the desired operating system and SCSI address. Jumpers are removable electrical connectors. See Figure 5-2 and the label on the rear of the drive for the location of these jumpers.

Selecting Operating System

The DADS jumper allows the drive to work with your operating system. The DADS jumper is the fifth jumper from the right side, and must be in place for both OpenVMS and DEC OSF/1 operating systems.

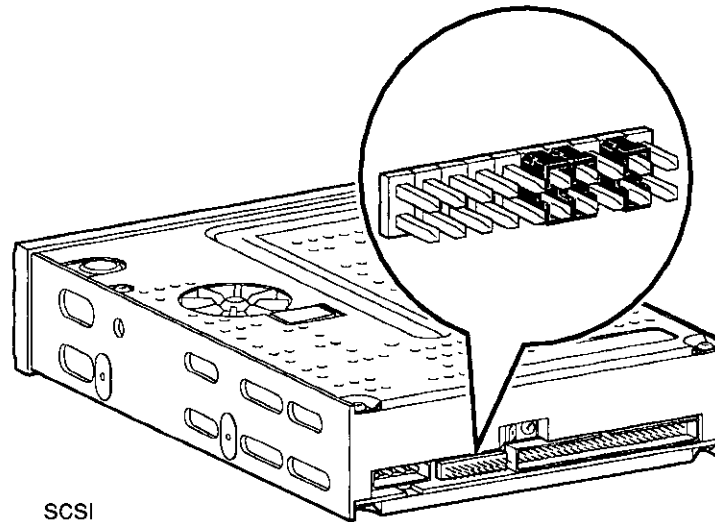
Selecting SCSI Address

DRIVE SELECT jumpers allow selection of a unique address for each SCSI drive. Figure 5-2 shows jumpers set for all SCSI addresses, including the recommended address of 5. The DRIVE SELECT jumpers are the second, third, and fourth jumpers from the right side.

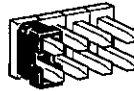
Default settings should be changed when a system is configured with more than one of a particular drive.

To change the default address, choose a new one from Figure 5-2 and carefully remove or replace jumpers accordingly, using tweezers or another small tool. Save any jumpers you remove. You may need them later.

Figure 5-2 TZK10 DRIVE SELECT and DADS Jumpers



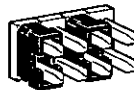
SCSI
Address
Settings: 0



1



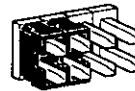
2



3



4



5



6



7



MLO-007533

**IMPORTANT:
Unique SCSI
Address**

Each drive must have a unique SCSI address. Never set two or more drives to the same SCSI address; the system will not be able to communicate with the drives.

Installing the TZK10 Drive

Overview

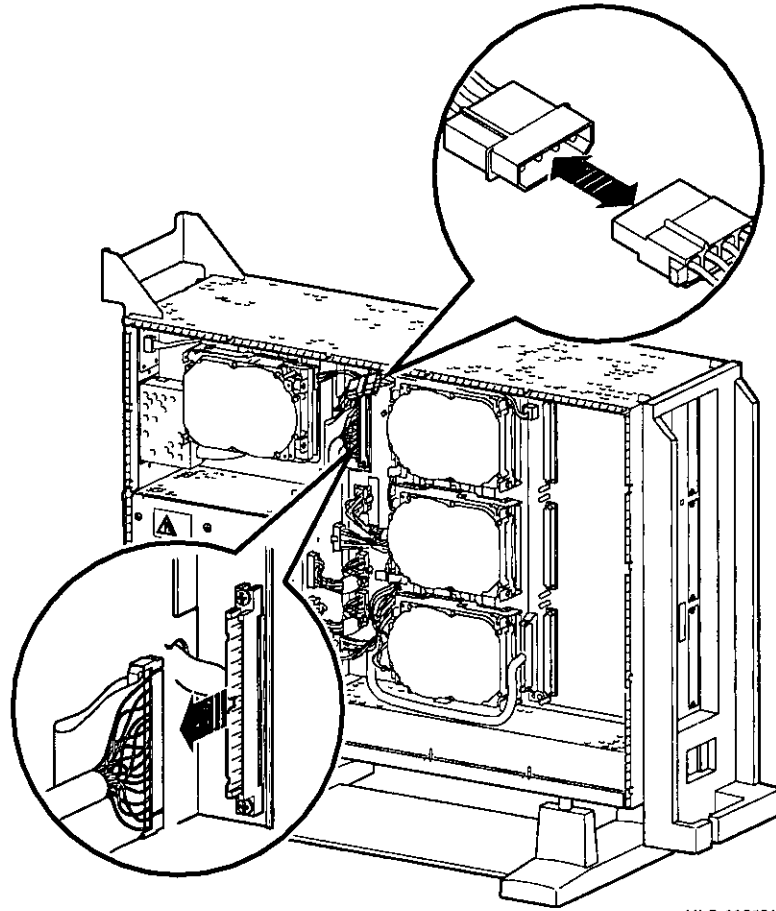
The TZK10 drive is installed in a bracket in the front of the system unit. The following steps tell you how to remove the bracket from the system unit, install the drive in the bracket, install drive cables, and place the bracket (with drive) back into the system unit.

To install a TZK10 drive, follow these steps:

Step 1: Remove Cables from System

Disconnect the bracket power and SCSI cables on the right side of the system, as shown in Figure 5-3. The bracket power and SCSI cables are shown in Figure 5-5 and Figure 5-6.

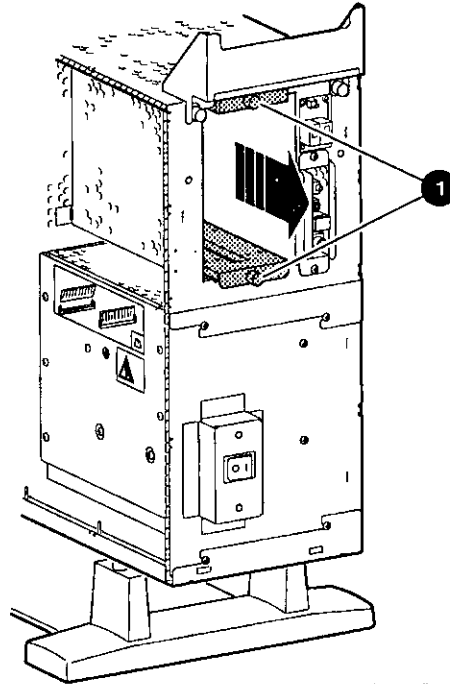
Figure 5-3 Disconnecting Bracket Power and SCSI Cables



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**Step 2:
Remove
Bracket**

Remove the drive bracket from the system by releasing the two thumbscrews ❶, as shown in Figure 5-4 and pulling the bracket straight out. The thumbscrews will pop out a little when they are fully loosened. If the thumbscrews are too tight, loosen the screws in the center of the thumbscrews.

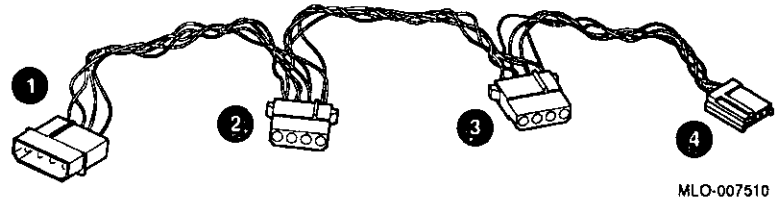
Figure 5-4 Removing the Drive Bracket

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

Each cable has several connectors. Refer to Figure 5-5 and Figure 5-6 when making cable connections.

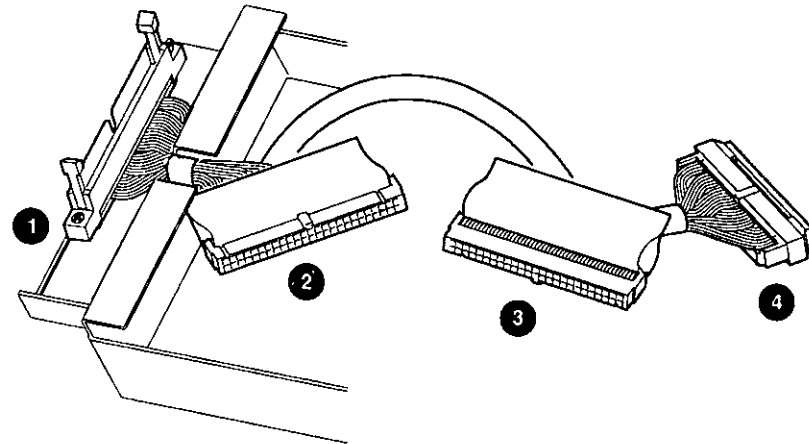
Figure 5-5 Bracket Power Cable Connectors



MLO-007510

- ❶ to system power harness
- ❷ to TZK10 drive, if installed in upper position
- ❸ to TZK10 drive, if installed in lower position
- ❹ not used for this drive

Figure 5-6 Bracket SCSI Cable Connectors



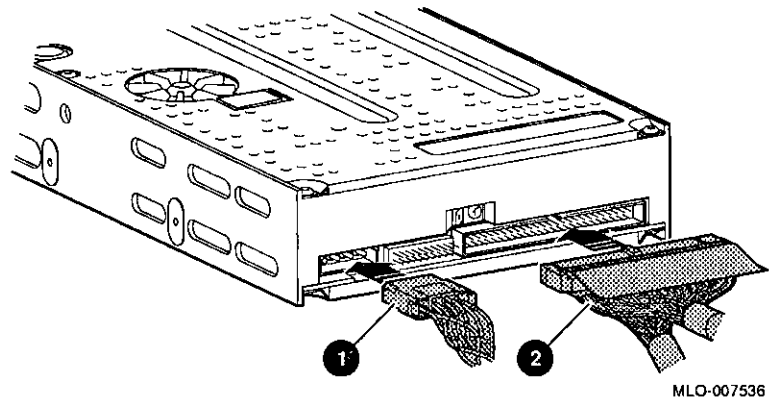
MLO-009887

- ❶ to system SCSI bus
- ❷ to TZK10 drive, if installed in lower position
- ❸ to TZK10 drive, if installed in upper position
- ❹ terminator

**Step 4:
Connect Cables
to Drive**

Connect the power ❶ and SCSI ❷ cables to the ports on the rear of the drive, as shown in Figure 5-7. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive ports.

Figure 5-7 Connecting Cables to the TZK10 Drive

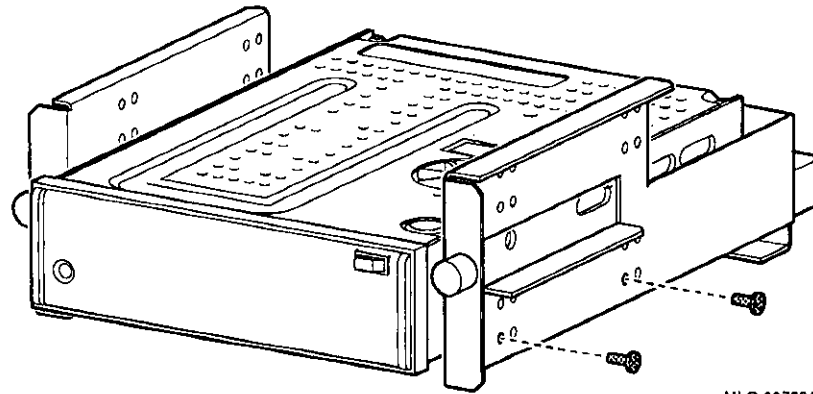


Installing the TZK10 Drive

Step 5: Place Drive in Bracket

Place the TZK10 drive in the bracket, as shown in Figure 5-8, and secure it with two screws on each side.

Figure 5-8 Placing the Drive Into the Bracket



MLO-007534

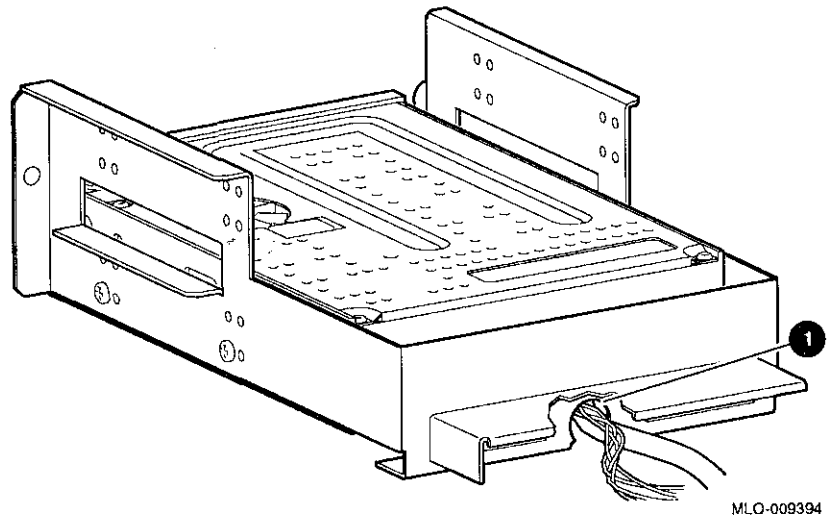
Position In Bracket

The TZK10 drive may be installed in *either* the upper or lower position.

**Step 6:
Position Cables**

Slip the power and SCSI cables into the slot ❶ in the rear of the bracket, as shown in Figure 5-9.

Figure 5-9 Slipping Cables into Slot

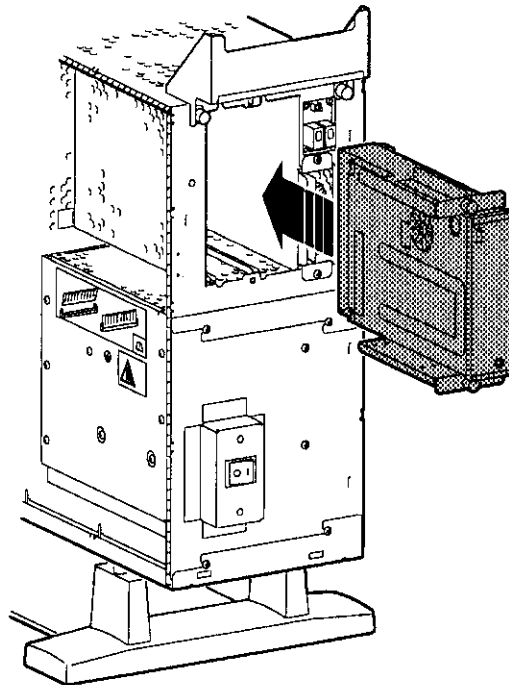


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**Step 7: Slide
Bracket into
System**

Slide the bracket partly into the system, as shown in Figure 5-10.

Figure 5-10 Sliding the Bracket into the System

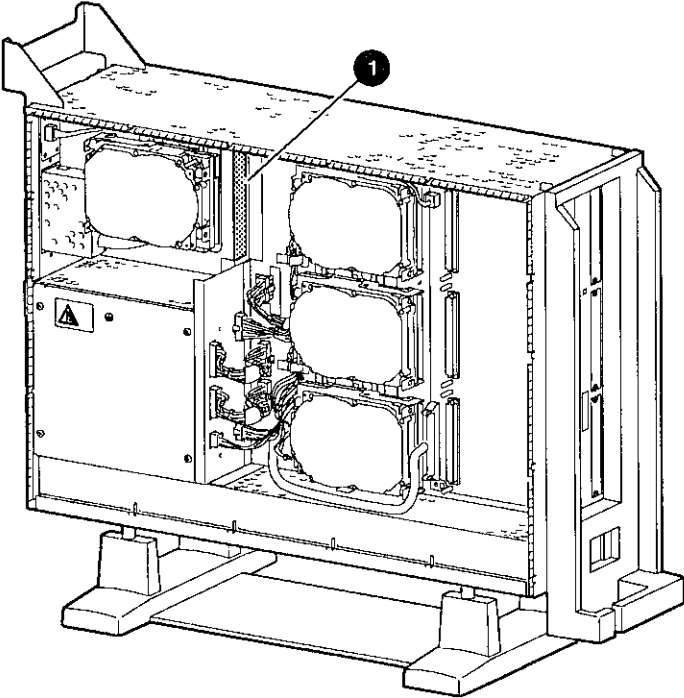


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**Step 8: Guide
Bracket Power
Cable**

Guide the bracket power cable through the opening ❶ into the right side of the system, as shown in Figure 5-11.

Figure 5-11 Bracket Power Cable Opening

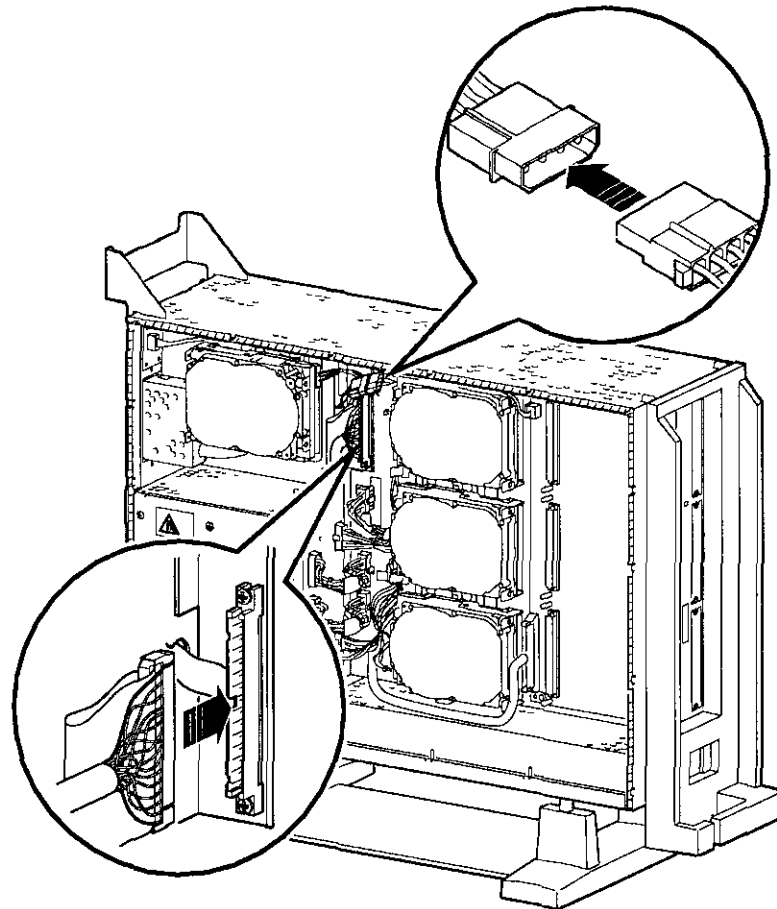


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**Step 9:
Connect Cables
to System**

Connect the bracket SCSI cable to the SCSI bus connector, and the power cable to the power harness, as shown in Figure 5-12.

Figure 5-12 Connecting Cables to the System



MLO-007512

**Step 10:
Tighten
Thumbscrews**

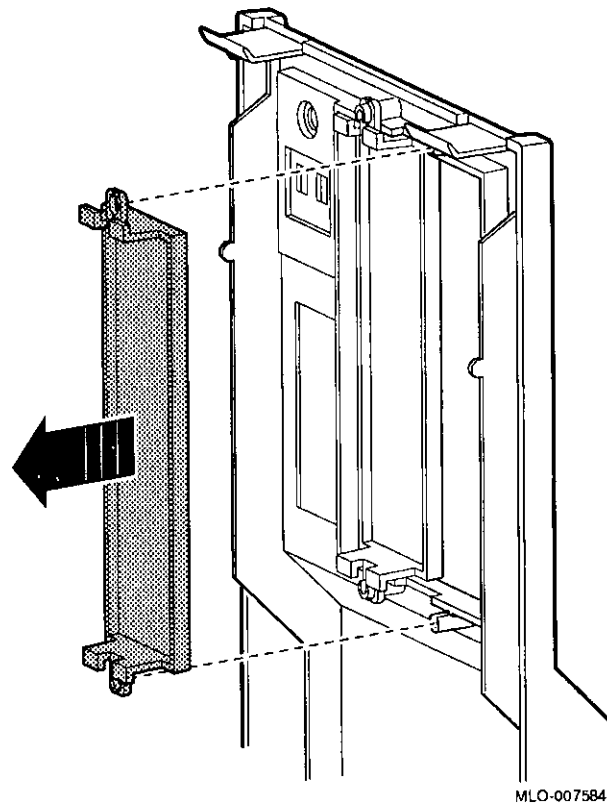
Slide the bracket all of the way in, and tighten the two thumbscrews.

**Step 11:
Remove Blank
Bezel**

Remove the blank bezel from the front panel position used by the drive, as shown in Figure 5-13.

Note that Figure 5-13 shows the left bezel being removed. The left bezel (as you look at the front of the panel) will be removed if the drive is installed in the upper position of the bracket; the right bezel will be removed if the drive is installed in the lower position.

Figure 5-13 Removing the Blank Bezel from the Front Panel



Completion

This completes installation of the TZK10 tape drive.

**Where to Go
from Here**

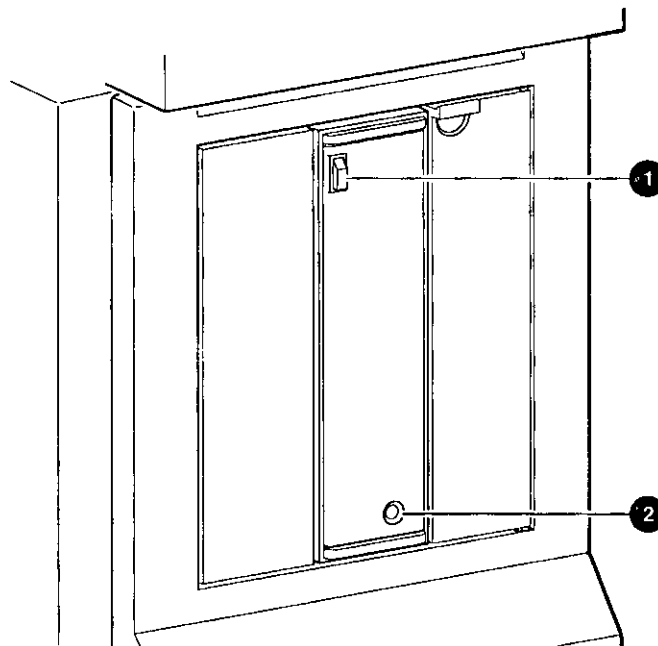
| If you... | Then... |
|---|---|
| Have other options to add inside the system, | turn to the appropriate chapter. |
| If you have <i>no</i> other options to add inside the system, | refer to Chapter 11 to replace the panels and check the system. |

Using the TZK10 Drive

TZK10 Controls and Indicators

The TZK10 tape drive has an eject button ❶ and one dual-color (green and amber) busy indicator light ❷. Figure 5-14 shows the eject button and indicator.

Figure 5-14 TZK10 Controls and Indicator



MLO-007537

Table 5-1 summarizes the meaning of each state of the busy indicator light.

Table 5-1 TZK10 Busy Indicator Light States

| State | Meaning |
|----------------|---|
| Off | Tape is not present or tape is present (loaded) but is not mounted. |
| Solid green | Tape is loaded and mounted. ¹ |
| Blinking green | Tape is in motion. |
| Solid amber | Drive is faulty. |

¹Tape cartridge is loaded automatically when inserted.

**CAUTION:
Handling and
Storing Tape
Cartridges**

When handling and storing TZK10 tape cartridges:

- Do not drop or strike cartridges.
- Keep cartridges out of direct sunlight, away from heaters and other sources of heat.
- Store cartridges where the temperature is between 10°C and 40°C (50°F and 104°F).
- If a cartridge has been exposed to extreme heat or cold, allow it to stabilize at room temperature for the same amount of time as it was exposed, up to 24 hours.
- Avoid placing cartridges near sources of electromagnetic interference, such as terminals, motors, and video or X-ray equipment. Any tape exposed to a magnetic field can lose information.
- Store a cartridge in a dust-free environment where the relative humidity is between 20% and 80%.
- Store a cartridge in its protective container, on edge or stacked. However, when stacking cartridges, do not stack more than five high.
- Place an identification label only in the space provided for the label on top of the cartridge.

For further information refer to the *TZK10 Cartridge Tape Drive Owner's Guide*, listed in Appendix A.

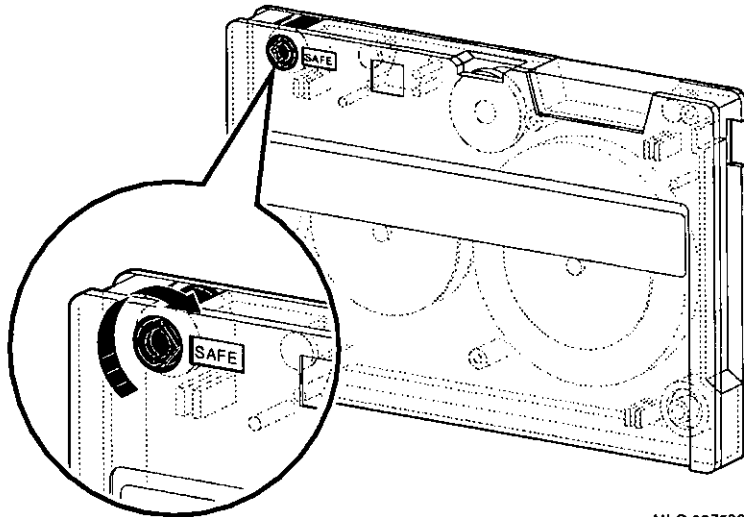
Write-Protecting TZK10 Tape Cartridges

Write-protecting a cartridge prevents accidental overwriting or erasure of data on the cartridge.

Before you use a cartridge, check its write-protect switch. When the switch is in the *SAFE* position, you can read information from the cartridge, but cannot write to it.

| To... | Turn write-protect switch... |
|---|---|
| Prevent accidental overwriting of data, | to the <i>SAFE</i> position, as shown in Figure 5-15. |
| Allow writing data to the tape, | away from the <i>SAFE</i> position. |

Figure 5-15 Write-Protecting TZK10 Tape Cartridges



MLO-007538

**Inserting a
TZK10 Tape
Cartridge**

To insert the tape into the drive, follow these steps:

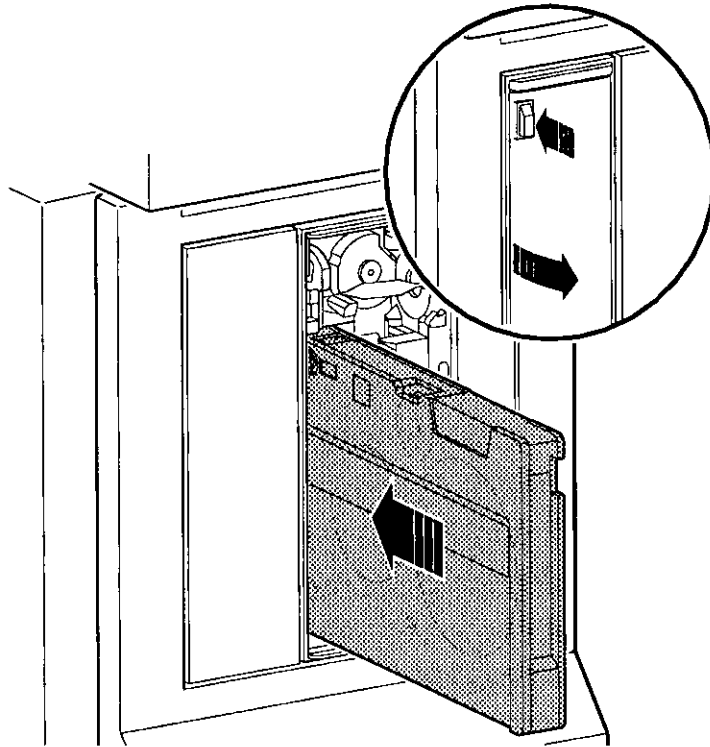
1. Make sure that the system unit is on (|).
2. Press the eject button to open the drive door on the front of the system unit (see Figure 5-16).
3. Insert the TZK10 tape cartridge into the drive with the cartridge oriented as shown in Figure 5-16.
4. Slide the cartridge straight into the drive until you feel resistance, then close the door.

When the tape is properly inserted, the indicator light is solid green and you can issue operating system commands.

5. If you are using the OpenVMS operating system, refer to your operating system documentation for mounting instructions.



Figure 5-16 Inserting the TZK10 Tape Cartridge



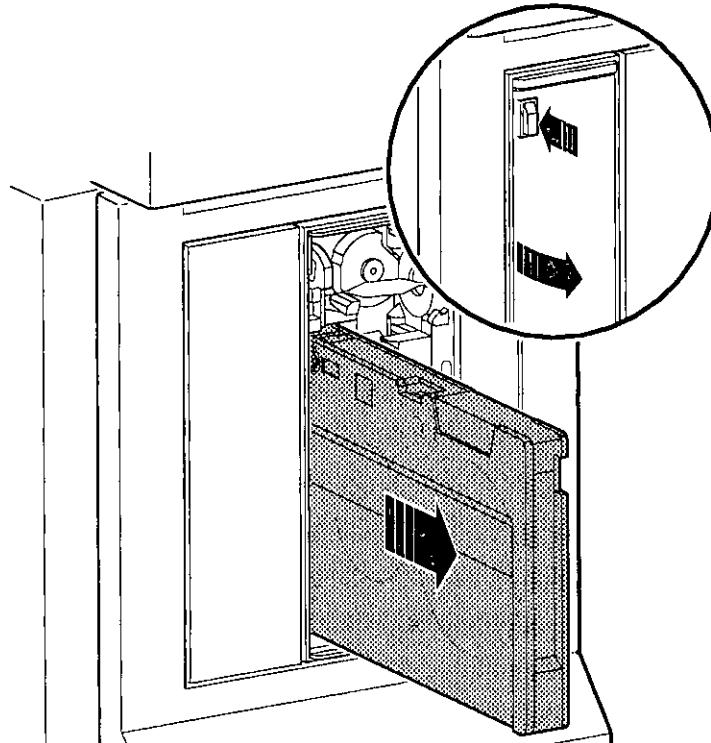
MLO-007539

Removing a TZK10 Tape Cartridge

To remove the tape from the drive, follow these steps:

1. If you are using the OpenVMS operating system, refer to your operating system documentation for dismounting instructions.
2. After data transfer is complete (the tape stops and the indicator light returns to solid green), press the eject button, as shown in Figure 5-17.
3. When the door opens and the cartridge ejects part way, open the door the completely, grasp the cartridge, and slide it out of the drive.

Figure 5-17 Removing the TZK10 Tape Cartridge



MLO-007540

TZK10 Drive Specifications

This section contains the following information:

- TZK10 Drive Weight and Dimensions
- TZK10 Drive Description
- TZK10 Drive Operating Conditions
- TZK10 Drive Nonoperating Conditions
- TZK10 Tape Cartridges

Table 5-2 TZK10 Drive Weight and Dimensions

| Weight¹ | Height | Width | Depth |
|---------------------------|---------------------|----------------------|---------------------|
| 1.1 kg (2.4 lb) | 4.4 cm (1.73 in) | 14.6 cm (5.75 in) | 20.8 cm (8.2 in) |

¹without cartridge

Table 5-3 TZK10 Drive Description

| | |
|---------------------------|---|
| Mode of operation | Streaming |
| Drive interface | SCSI-2 |
| Media | DC6320/DC6525 tape cartridge or Digital approved equivalent (see Table 5-6) |
| Track width, write | 0.1778 mm +0.0000/-0.0127 mm (0.0070 inches +0.0000 inches/-0.0005 inches) |
| Track width, read | 0.1270 mm +0.0127/-0.0000 mm (0.0050 inches +0.0005 inches/-0.0000 inches) |
| Data density | 16,000 bits/in |
| Number of tracks | 26 |
| Data transfer rate | 200 KB at average streaming mode 1½ MB at SCSI maximum |
| Tape speed | 3.05 cm/s (120 in/s) |
| Track format | Multiple track serpentine recording |
| Power requirements | +12 V ± 5% @ 1.0 A (2.0 A surge), 150 mV ripple peak-to-peak +5 V ± 5% @ 1.2 A (1.8 A surge), 150 mV ripple peak-to-peak |
| Nominal power consumption | 20 watts |
| Peak power consumption | 33 watts |

Table 5-4 TZK10 Drive Operating Conditions

| | |
|------------------------------------|--|
| Operating temperature ¹ | 5°C to 40°C (41°F to 104°F) |
| Operating humidity | 20% to 80%, noncondensing |
| Maximum wet bulb temperature | 26°C (79°F) |
| Minimum dew point temperature | 2°C (36°F) |
| Altitude | 0 m to 2400 m (0 ft to 13,000 ft) at 36°C (96°F) |

¹Reduce maximum temperature by 1.8°C (3.24°F) for each 1000-meter (3300-foot) increase in altitude.

Table 5-5 TZK10 Drive Nonoperating Conditions

| | |
|-------------------------------|---|
| Nonoperating temperature | -30°C to 60°C (-22°F to 140°F) |
| Nonoperating humidity | 10% to 90%, noncondensing |
| Maximum wet bulb temperature | 29°C (84°F) |
| Minimum dew point temperature | 2°C (36°F) |
| Altitude | -304 m to 12,300 m (-1000 ft to 40,000 ft) at 36°C (96°F) |

Table 5-6 TZK10 Tape Cartridges

| Cartridge | Maximum Capacity | Format | R/W ¹ | Length |
|--------------------|------------------|---------|------------------|--------------------|
| DC6525 | 525 MB | QIC-320 | R/W | 300 m (1000 ft) |
| DC6320 | 320 MB | QIC-320 | R/W | 186 m (620 ft) |
| DC6150 DC600XTD | 150 MB | QIC-150 | R/W | 189 m (620 ft) |
| DC6150 DC600XTD | 120 MB | QIC-120 | R/W | 189 m (620 ft) |
| DC600A | 60 MB | QIC-24 | R | 183 m (600 ft) |

¹R/W = read/write capabilities

TLZ06 Tape 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
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

Chapter Overview

This chapter covers the following topics:

- Description of the TLZ06 Drive
- Configuring the TLZ06 Drive
- Installing the TLZ06 Drive
- Using the TLZ06 Drive
- TLZ06 Drive Specifications

Description of the TLZ06 Drive

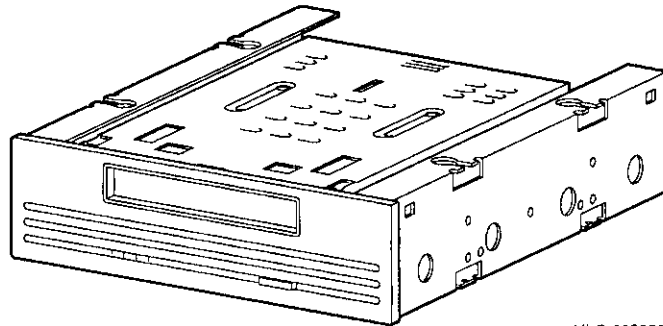
Capacity The capacity of the TLZ06 tape drive is 4.0 gigabytes.
See Table 6-5 for more capacity information.

Purpose The TLZ06 tape drive can be used for:

- File backup
- Loading applications

Illustration The TLZ06 tape drive is shown in Figure 6-1.

Figure 6-1 TLZ06 Tape Drive



MLO-008526

Configuring the TLZ06 Drive

Setting Switches

Before you can use the TLZ06, configure the drive, that is, check the mode and SCSI address switches to make sure that they are set for the desired operating system and SCSI address. See Figure 6-2 for the location of these switches.

Selecting Operating System

Switch 5 allows the drive to work with your operating system, and must be down for both OpenVMS and DEC OSF/1 operating systems.

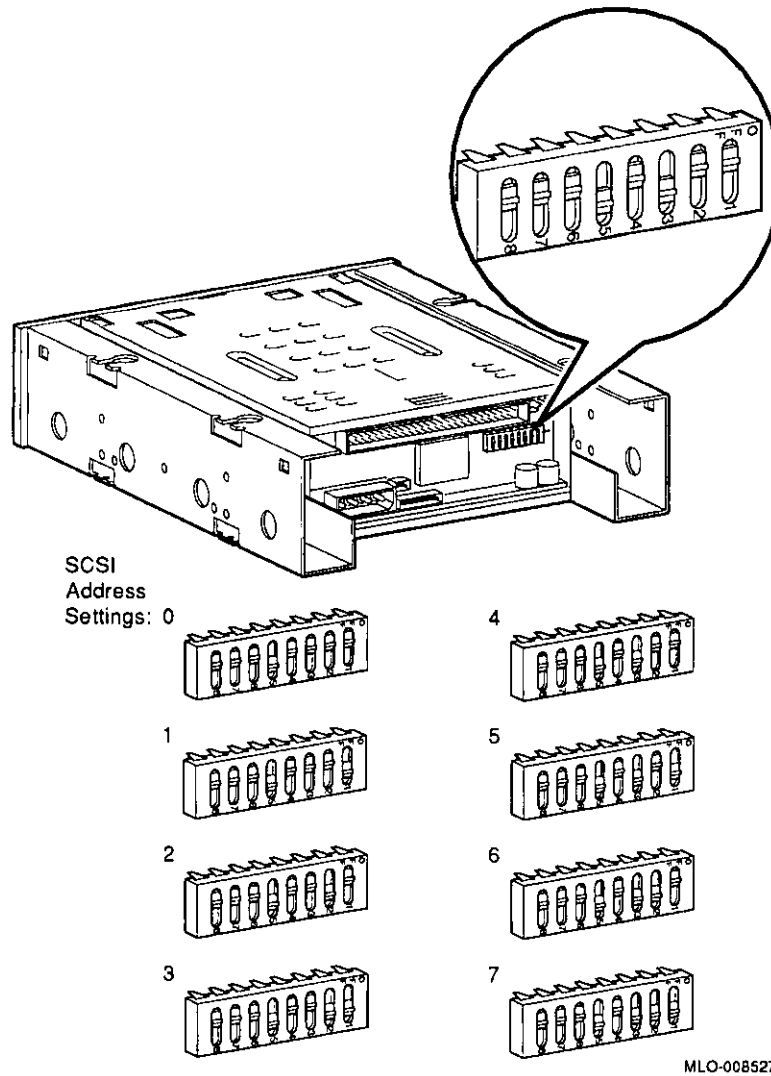
Selecting SCSI Address

SCSI switches allow selection of a unique address for each SCSI drive. Figure 6-2 shows switches set for all SCSI addresses, including the recommended address of 5.

Default settings should be changed when a system is configured with more than one of a particular drive.

To change the default address, choose a new one from Figure 6-2 and set the switches accordingly.

Figure 6-2 TLZ06 Mode and SCSI Address Switches



**IMPORTANT:
Unique SCSI
Address**

Each drive must have a unique SCSI address. Never set two or more drives to the same SCSI address; the system will not be able to communicate with the drives.

Installing the TLZ06 Drive

Overview

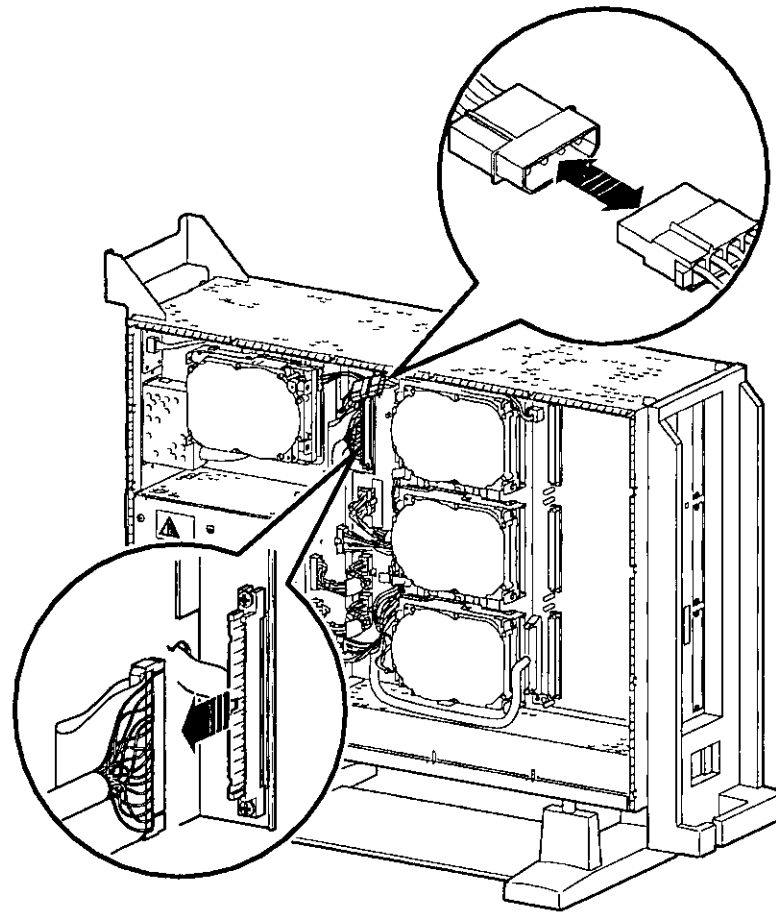
The TLZ06 drive is mounted in a bracket in the front of the system unit. The following steps tell you how to remove the bracket from the system unit, install the drive in the bracket, install drive cables, and place the bracket (with drive) back into the system unit.

To install a TLZ06 drive, follow these steps:

Step 1: Remove Cables from System

Disconnect the bracket power and SCSI cables on the right side of the system, as shown in Figure 6-3. The bracket power and SCSI cables are shown in Figure 6-5 and Figure 6-6.

Figure 6-3 Disconnecting Bracket Power and SCSI Cables



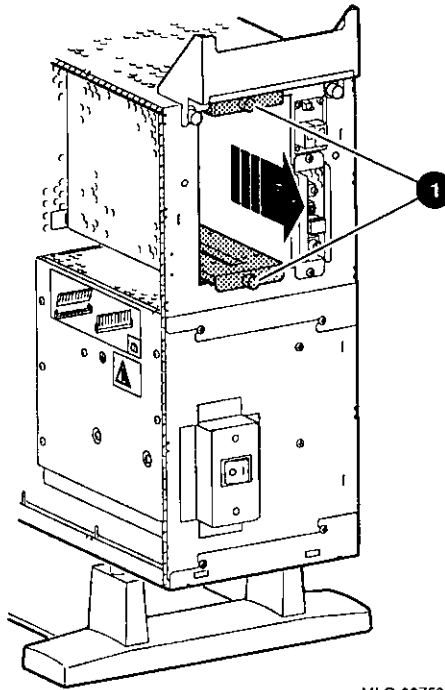
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**Step 2:
Remove
Bracket**

Remove the drive bracket from the system by releasing the two thumbscrews ❶, as shown in Figure 6-4 and pulling the bracket straight out. The thumbscrews will pop out a little when they are fully loosened. If the thumbscrews are too tight, loosen the screws in the center of the thumbscrews.

Figure 6-4 Removing the Drive Bracket

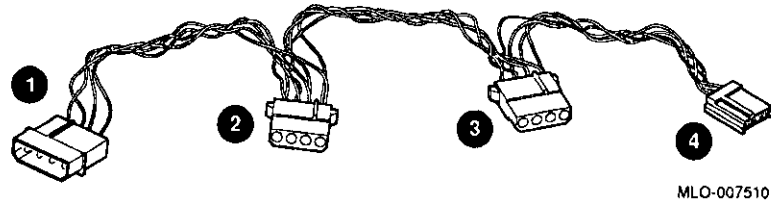


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**Step 3: Identify
Bracket Power
and SCSI
Cables**

Each cable has several connectors. Refer to Figure 6-5 and Figure 6-6 when making cable connections.

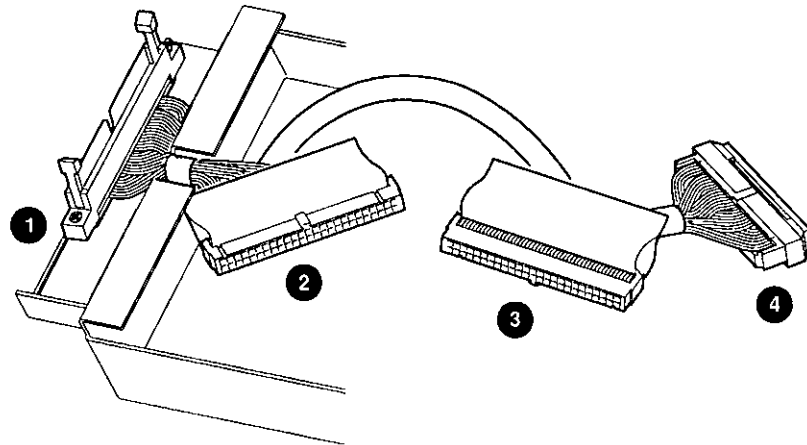
Figure 6-5 Bracket Power Cable Connectors



MLO-007510

- ① to system power harness
- ② to TLZ06 drive, when installed in upper position
- ③ to TLZ06 drive, when installed in lower position
- ④ not used for this drive

Figure 6-6 Bracket SCSI Cable Connectors



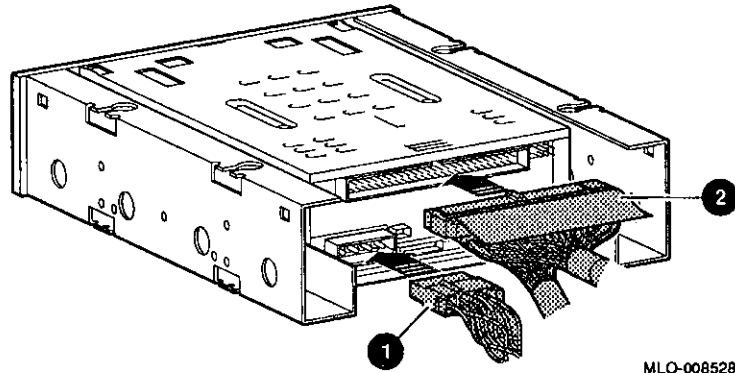
MLO-009887

- ① to system SCSI bus
- ② to TLZ06 drive, when installed in lower position
- ③ to TLZ06 drive, when installed in upper position
- ④ terminator

**Step 4:
Connect Cables
to Drive**

Connect the power ❶ and SCSI ❷ cables to the ports on the rear of the drive, as shown in Figure 6-7. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive ports.

Figure 6-7 Connecting Cables to the TLZ06 Drive

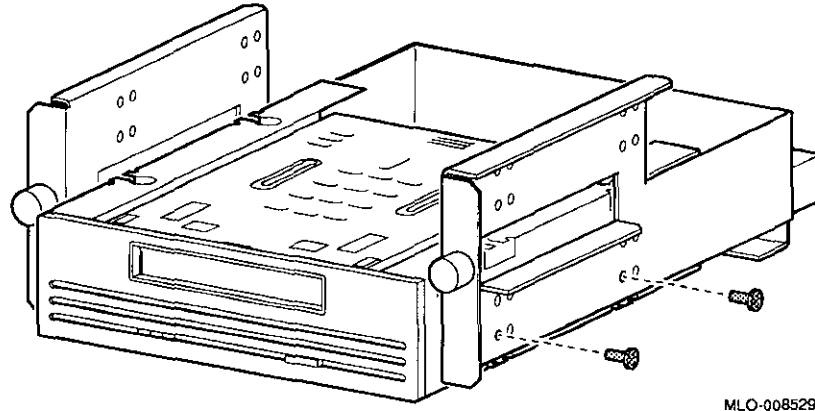


Installing the TLZ06 Drive

Step 5: Place Drive in Bracket

Place the TLZ06 drive in the bracket, as shown in Figure 6-8, and secure it with two screws on each side.

Figure 6-8 Placing the Drive into the Bracket



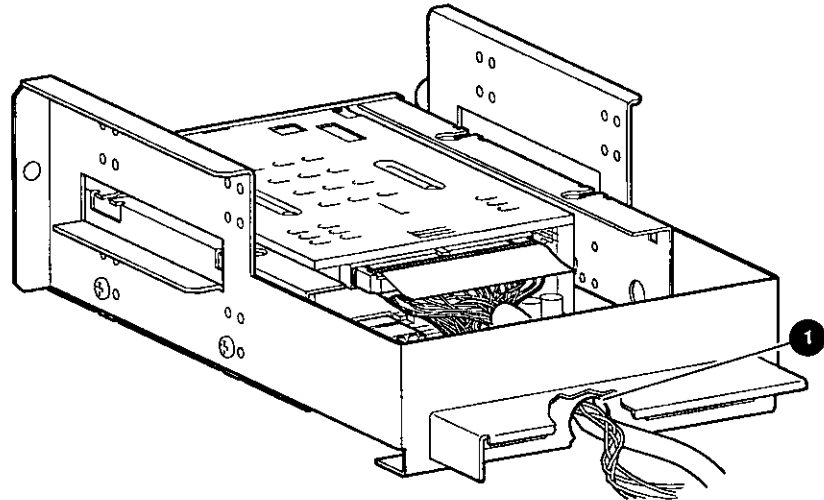
Determining Position in Bracket

The TLZ06 drive may be mounted in *either* the upper or lower position.

**Step 6:
Position Cables**

Slip the power and SCSI cables into the slot ❶ in the rear of the bracket, as shown in Figure 6-9.

Figure 6-9 Slipping Cables into Slot

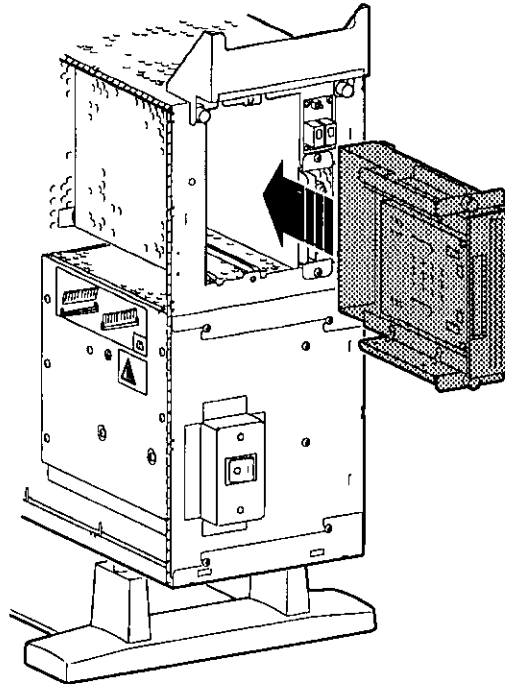


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**Step 7: Slide
Bracket into
System**

Slide the bracket partly into the system, as shown in
Figure 6-10.

Figure 6-10 Sliding the Bracket Into the System



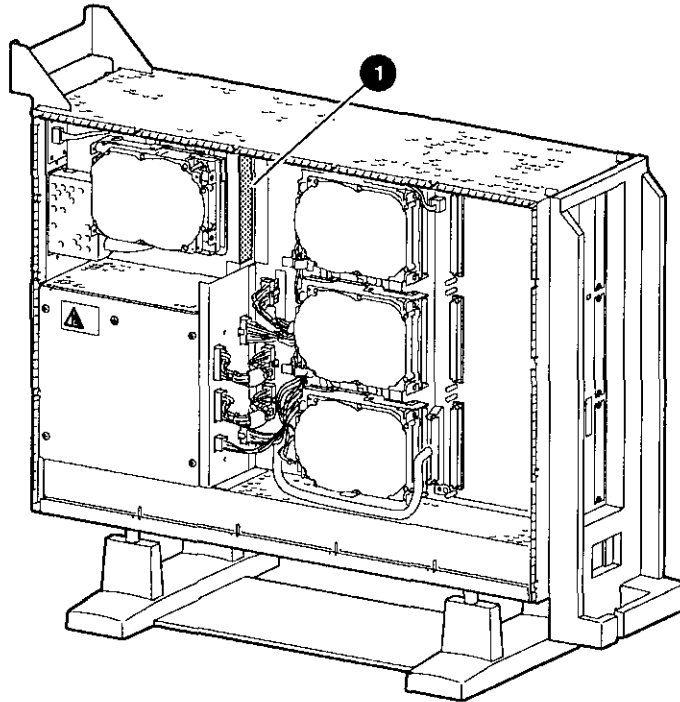
MLO-008530



**Step 8: Guide
Bracket Power
Cable**

Guide the bracket power cable through the opening ❶ into the right side of the system, as shown in Figure 6–11.

Figure 6–11 Bracket Power Cable Opening

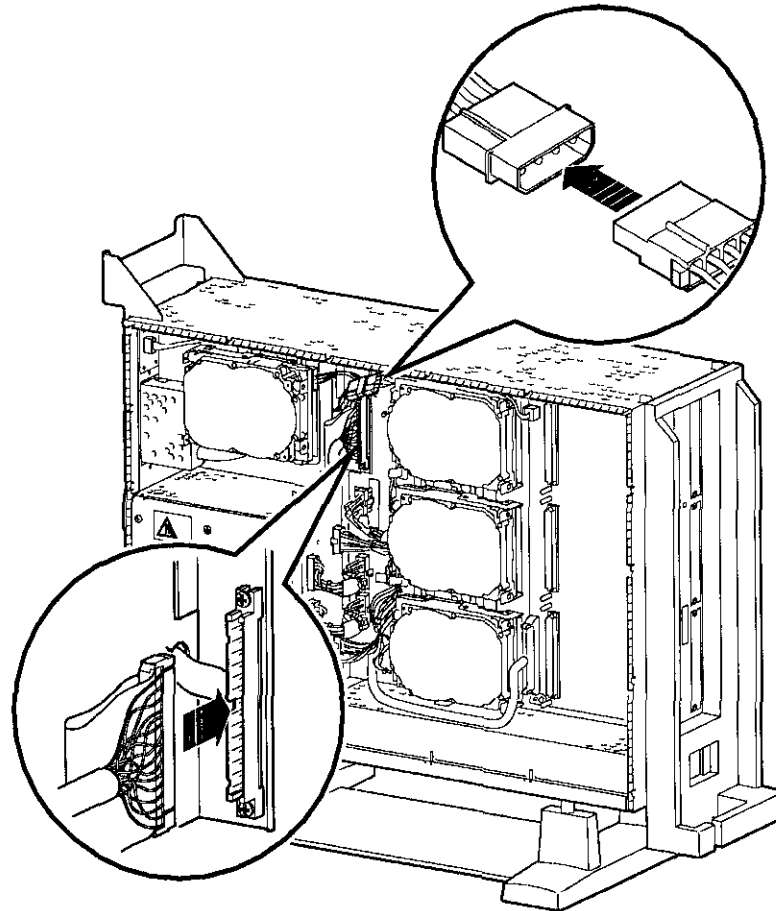


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**Step 9:
Connect Cables
to System**

Connect the bracket SCSI cable to the SCSI bus connector, and the power cable to the power harness, as shown in Figure 6-12.

Figure 6-12 Connecting Cables to the System



**Step 10:
Tighten
Thumbscrews**

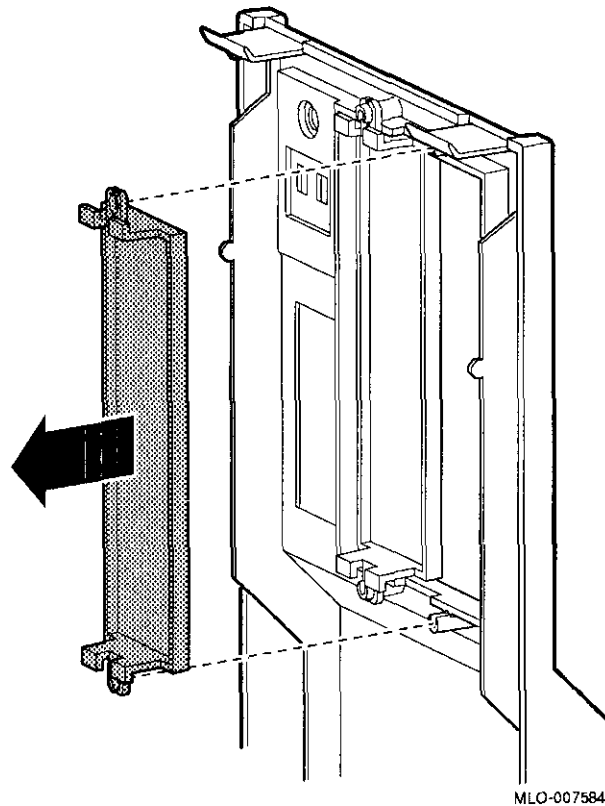
Slide the bracket all of the way in, and tighten the two thumbscrews.

**Step 11:
Remove Blank
Bezel**

Remove the blank bezel from the front panel position used by the drive, as shown in Figure 6-13.

Note that Figure 6-13 shows the left panel being removed. The left panel (as you look at the front of the panel) will be removed if the drive is mounted in the upper position of the bracket, or the right panel will be removed if the drive is mounted in the lower position.

Figure 6-13 Removing the Blank Bezel from the Front Panel



Completion

This completes installation of the TLZ06 tape drive.

**Where to Go
from Here**

| If you... | Then... |
|---|---|
| Have other options to add inside the system, | turn to the appropriate chapter. |
| If you have <i>no</i> other options to add inside the system, | refer to Chapter 11 to replace the panels and check the system. |

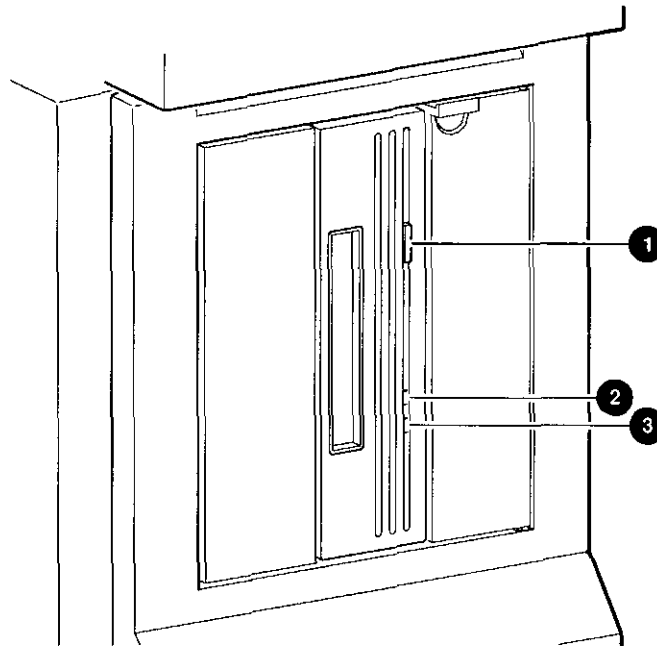


Using the TLZ06 Drive

TLZ06 Control and Indicators

Figure 6-14 shows the control and indicators on the TLZ06 drive.

Figure 6-14 TLZ06 Controls and Indicators



MLO-008531

- ❶ Tape unload button
- ❷ Write-protect indicator
- ❸ Tape activity indicator

Handling and Storing Tape Cassettes

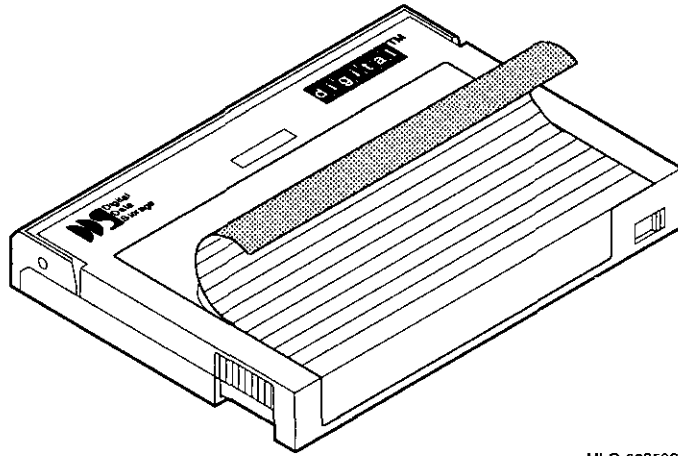
When handling and storing TLZ06 tape cassettes:

- Do not drop or strike cassettes.
- Keep cassettes out of direct sunlight, away from heaters and other sources of heat.
- Store cassettes where the temperature is between 10°C and 40°C (50°F and 104°F).
- If a cassette has been exposed to extreme heat or cold, allow it to stabilize at room temperature for the same amount of time as it was exposed, up to 24 hours.
- Avoid placing cassettes near sources of electromagnetic interference, such as terminals, motors, and video or X-ray equipment. Any tape exposed to a magnetic field can lose information.
- Store cassettes in a dust-free environment where the relative humidity is between 20% and 80%.
- Store cassettes in their protective containers, on edge or stacked. However, when stacking cassettes, do not stack more than five high.
- Place an identification label only in the space provided for the label on top of the cassette, as shown in Figure 6-15.

**Labeling TLZ06
Tape Cassettes**

Figure 6–15 shows the proper placement of a cassette label.

Figure 6–15 Labeling the TLZ06 Tape Cassette



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Write-Protecting TLZ06 Tape Cassettes


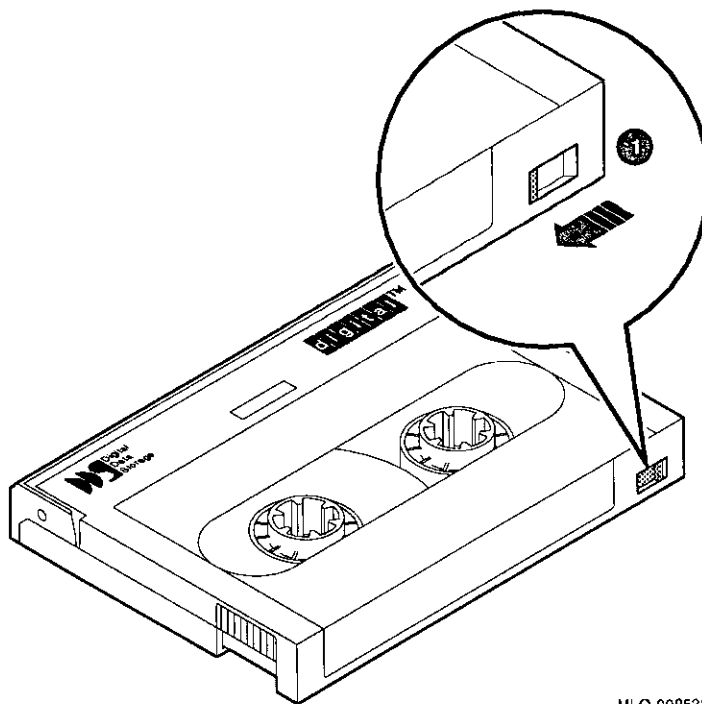
To write-protect a TLZ06 cassette, slide the write-protect switch to the left , as shown in Figure 6-16. To allow the drive to write to the cassette, slide the switch to the right.

Figure 6-16 Write-Protecting the TLZ06 Tape Cassette



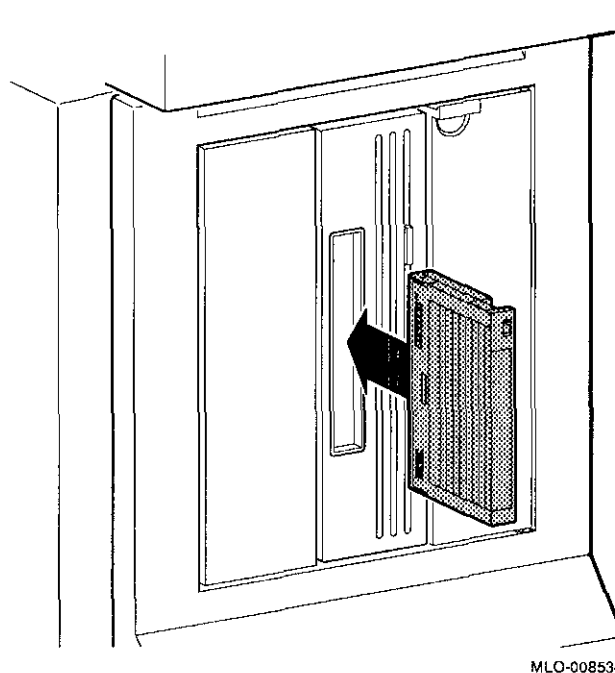
MLO-008533

Inserting a TLZ06 Tape Cassette

To insert the tape into the drive, follow these steps:

1. Make sure that the system unit is on (I).
2. Insert the TLZ06 tape cassette into the drive, as shown in Figure 6-17.
3. If you are using the OpenVMS operating system, refer to your operating system documentation for mounting instructions.

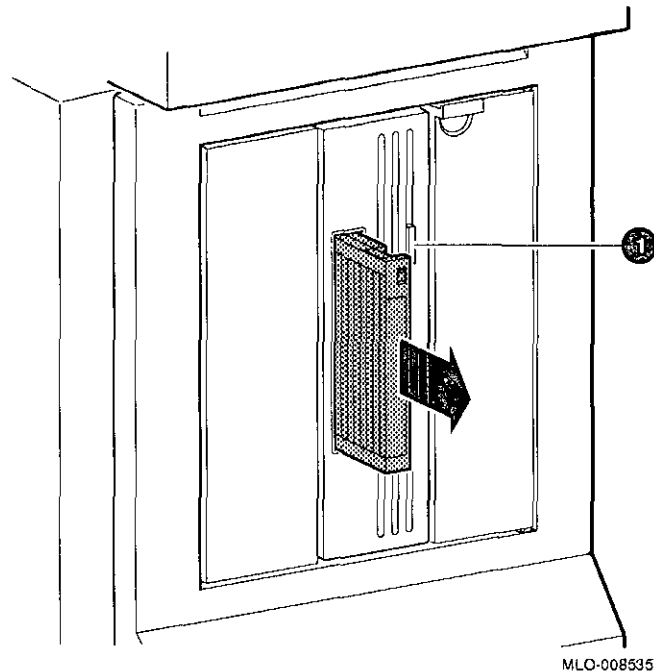
Figure 6-17 Inserting the TLZ06 Tape Cassette



Removing a TLZ06 Tape Cassette

1. If you are using the OpenVMS operating system, refer to your operating system documentation for dismounting instructions.
2. Press the tape unload button **1**, as shown in Figure 6-18, and remove the tape from the drive.

Figure 6-18 Removing the TLZ06 Tape Cassette



TLZ06 Drive Specifications

This section provides the following information:

- TLZ06 Drive Weight and Dimensions
- TLZ06 Drive General Specifications
- TLZ06 Drive Operating Conditions
- TLZ06 Drive Nonoperating Conditions
- TLZ06 Cassettes

Table 6-1 TLZ06 Drive Weight and Dimensions

| Weight | Height | Width | Depth |
|---------------|---------------|--------------|--------------|
| 2.2 kg | 4.1 cm | 14.6 cm | 17.8 cm |
| (4.7 lb) | (1.6 in) | (5.75 in) | (7.0 in) |

Table 6-2 TLZ06 Drive General Specifications

| | |
|--|---|
| Formatted capacity per drive | 320 MB, approximate DC6320 cassette |
| Formatted capacity per drive | 525 MB, approximate DC6525 cassette |
| Formatted capacity per surface | 2.48 MB |
| Formatted capacity per track | 18,432 |
| Formatted capacity per block | 512 bytes |
| Formatted blocks per track | 36 |
| Formatted blocks per drive | 649,040 |
| Formatted capacity spare blocks per cylinder | 8 |
| Formatted capacity spare blocks per drive | 10,300 MB |
| Transfer rate to/from media | 1.50 MB/s |
| Performance bus asynchronous mode | 1.50 MB/s |
| Performance bus synchronous mode | 4 MB/s |
| Performance seek time track to track | ≤ 4 ms |
| Performance seek time average | ≤ 16 ms |
| Performance seek time maximum | ≤ 35 ms |
| Average rotational latency | 8.3 ms |
| Rotational speed | 3600 rpm |
| Start time | 20 s maximum |
| Stop time | 20 s maximum |
| Interleave ratio | 1:1 |
| Bus latency | 600 μ s |
| Input current | 2.4 A @ 100-120 Vac |
| Frequency | 50-60 Hz |
| Power | 9 watts |

Table 6-3 TLZ06 Drive Operating Conditions

| | |
|-------------------------------|-----------------------------------|
| Operating temperature | 10°C to 40°C (50°F to 104°F) |
| Operating humidity | 20% to 80%, noncondensing |
| Maximum wet bulb temperature | 26°C (79°F) |
| Minimum dew point temperature | 2°C (36°F) |
| Altitude | 0 m to 4.6 km (0 ft to 15,000 ft) |

Table 6-4 TLZ06 Drive Nonoperating Conditions

| | |
|-------------------------------|-------------------------------------|
| Nonoperating temperature | -40°C to 70°C (-40°F to 158°F) |
| Nonoperating humidity | 5% to 95%, noncondensing |
| Maximum wet bulb temperature | 29°C (84°F) |
| Minimum dew point temperature | 2°C (36°F) |
| Altitude | 0 km to 15.2 km (0 ft to 50,000 ft) |

Table 6-5 TLZ06 Cassettes

| Cassette | Size | Capacity |
|-----------------------|-----------|----------------------|
| TLZ04-CA ¹ | 4mm x 60m | 1.3 or 2.6 gigabytes |
| TLZ06-CA | 4mm x 90m | 2 or 4 gigabytes |

¹Can read only if compression is not enabled

RZ25 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
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

Chapter Overview

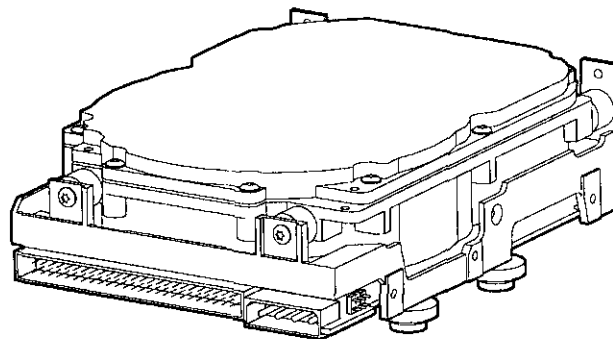
This chapter covers the following topics:

- Description of the RZ25 Drive
- Setting SCSI Address
- Installing the RZ25 Drive
- Removing an RZ25 Drive
- RZ25 Drive Specifications

Description of the RZ25 Drive

- Capacity** The capacity of the RZ25 drive is 426 megabytes.
- Purpose** The RZ25 drive can be used for storing applications and user files.
- Illustration** The RZ25 fixed disk drive is shown in Figure 7-1.

Figure 7-1 RZ25 Fixed Disk Drive



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Setting SCSI Address

Address Jumpers

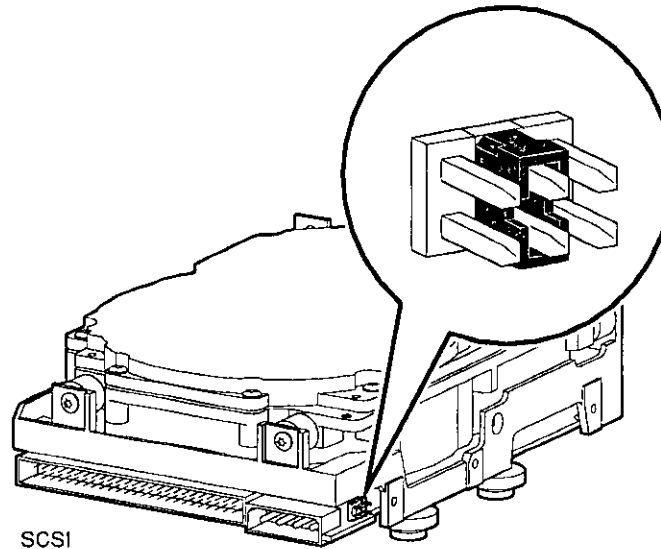
Before using the RZ25 drive, check the SCSI address jumpers to ensure that they are set for the desired address. Jumpers are removable electrical connectors that allow selection of a unique address for each SCSI drive.

Figure 7-2 shows jumper settings for all SCSI addresses, including the recommended addresses of 0, 1, and 2. If your system does not contain a factory-installed fixed disk, the address of 3 should also be available. If using more than one fixed disk drive, select a unique SCSI address for each fixed disk drive. Figure 7-4 shows preferred addresses for given drive positions.

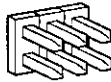
If the fixed disk drive was *not* factory-installed, it may have been shipped with *all* of the jumpers attached (to prevent loss of jumpers when shipping and unpacking). In this case, the address is set to 7, and you probably need to change it.

To change the default address, choose a new one from Figure 7-2 and carefully remove or replace jumpers accordingly. Save any SCSI jumpers you remove. You may need them later.

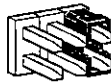
Figure 7-2 RZ25 SCSI Address Jumpers



SCSI
Address
Settings: 0



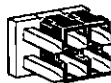
1



2



3



4



5



6



7



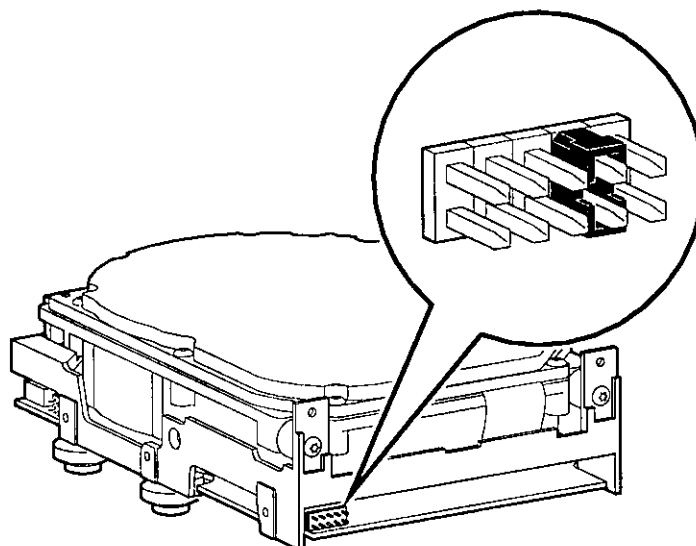
MLO-007556

**IMPORTANT:
Unique SCSI
Address**

Each drive must have a unique SCSI address. Never set two or more drives to the same SCSI address; the system will not be able to communicate with the drives.

**Remote SCSI
Address
Jumpers**

The SCSI address for the RZ25 drive is designed to be set either manually or automatically. The automatic setting is not applicable to the DEC 3000 AXP Model 500/500S systems, therefore, you need to make sure that the first three jumpers on the left of this secondary port are removed, so that the port is as shown in Figure 7-3. Be careful to remove *only* the SCSI address jumpers; do not remove any others.

Figure 7-3 RZ25 Secondary SCSI Address Port

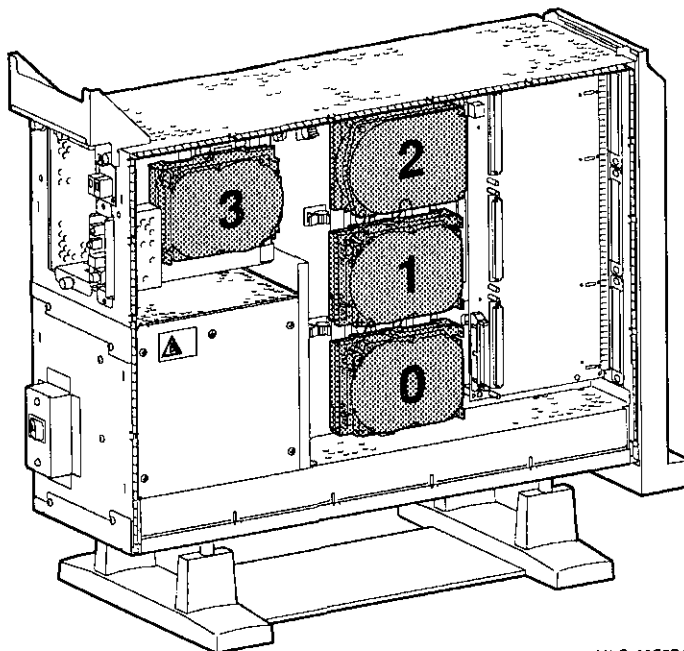
MLO-007562

Installing the RZ25 Drive

Overview

Up to four fixed disk drives may be installed in the system. An RZ25 or RZ26 drive can be installed at any of the four drive positions shown in Figure 7-4. The numbers refer to the preferred SCSI addresses for given positions.

Figure 7-4 Fixed Disk Drive Positions



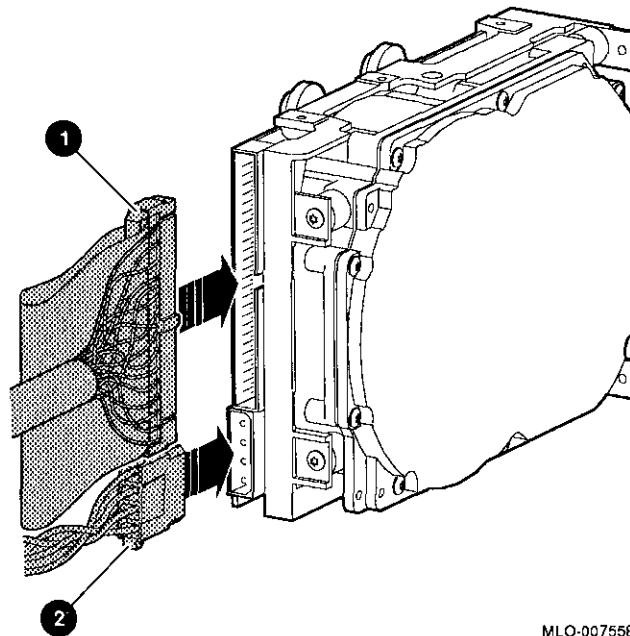
MLO-007574

To install an RZ25 drive, follow these steps:

**Step 1:
Connect Cables**

Connect the SCSI **1** and power **2** connectors to the RZ25 disk drive, as shown in Figure 7-5. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive.

Figure 7-5 Connecting RZ25 Cables



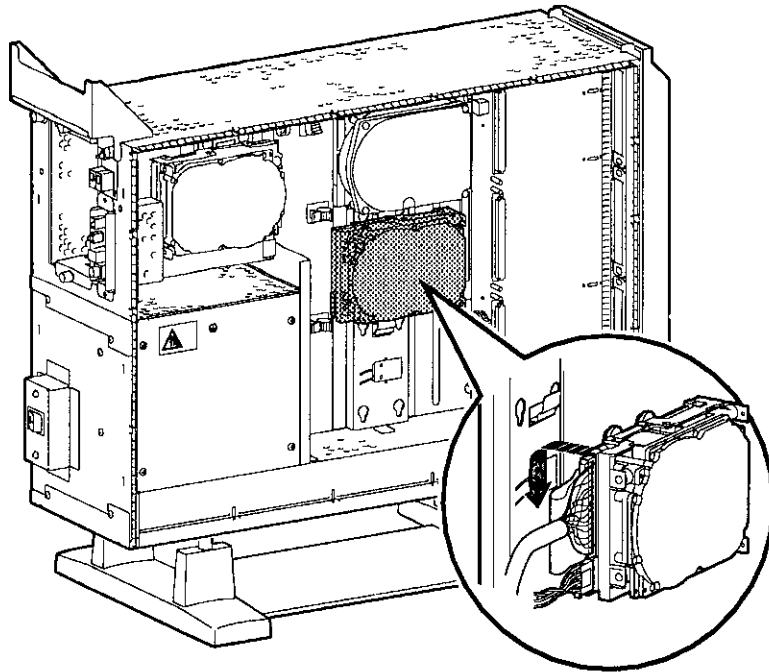
MLO-007558

Installing the RZ25 Drive

Step 2: Attach Drive to System

Orient the drive as shown in Figure 7-6, insert the knobs on the base of the drive into the holes in the mounting position, and slide the drive down until the latch engages.

Figure 7-6 Installing the RZ25 Drive



MLO-007557

Completion

This completes installation of the RZ25 fixed disk drive.

**Where to Go
from Here**

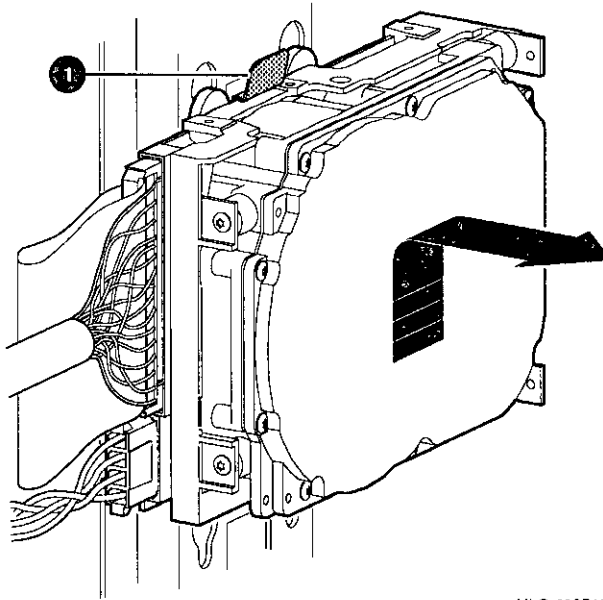
| If you... | Then... |
|--|--|
| Want to remove an RZ25 drive, | continue with the next section. |
| Have <i>other</i> options to add inside the system, | turn to the appropriate chapter. |
| Have <i>no</i> other options to add inside the system, | refer to Chapter 11 to restore and check the system. |

Removing an RZ25 Drive

Remove Drive from System Unit

To remove an RZ25 drive, press the latch ❶ at the top of the drive, as shown in Figure 7-7, and slide the drive up and away from the system unit.

Figure 7-7 Removing the RZ25 Drive



MLO-009719

Disconnect Cables

Remove the power and SCSI cables from the drive.

RZ25 Drive Specifications

This section provides the following information:

- RZ25 Weight and Dimensions
- RZ25 Drive Formatted Storage Capacity
- RZ25 Drive Performance
- RZ25 Drive Operating Conditions
- RZ25 Drive Nonoperating Conditions

Table 7-1 RZ25 Weight and Dimensions

| Weight | Height | Width | Depth |
|--------------------|---------------------|----------------------|----------------------|
| 0.8 kg (1.8 lb) | 4.1 cm (1.63 in) | 10.2 cm (4.00 in) | 14.6 cm (5.75 in) |

Table 7-2 RZ25 Drive Formatted Storage Capacity

| | |
|------------------------|--------------------------------|
| Per drive | 426 MB |
| Per surface | 47.3 MB |
| Bytes per track | 24,576 to 37,376 (variable) |
| Bytes per block | 512 |
| Blocks per track | 48-74 |
| Blocks per drive | 832,527 |
| Spare blocks per track | 1 |
| Spare blocks per drive | 14,148 |
| Spare cylinders | 2 |
| Buffer size | 60 KB |

Table 7-3 RZ25 Drive Performance

| | |
|-----------------------------------|---------------------------|
| Data transfer rate to/from media | 2.1-3.2 MB/sec (variable) |
| Data transfer rate to/from buffer | 2.33 MB/sec |
| Bus asynchronous | 3.0 MB |
| Bus synchronous | 4.0 MB |
| Seek time track to track | 2½ msec |
| Seek time average | 14 msec |
| Seek time maximum (full stroke) | 28 msec |
| Average latency | 6.8 msec |
| Rotational speed | 4412 rpm \pm 0.5% |
| Start time | 20 sec maximum |
| Stop time | 30 sec maximum |
| Interleave ratio | 1:1 |

Table 7-4 RZ25 Drive Operating Conditions

| | |
|------------------------------|--|
| Ambient temperature | 10°C to 50°C (50°F to 122°F) |
| Relative humidity | 8%-80% |
| Altitude | 30.48 m to 304.78 m (-1000 ft to 10,000 ft) |
| Maximum wet bulb temperature | 25.6°C (78°F) (noncondensing) |
| Heat dissipation | 12W (seeking) 10W (typical) |
| Temperature gradient | 11°C/hr (20°F/hr) |

Table 7-5 RZ25 Drive Nonoperating Conditions

| | |
|------------------------------|--------------------------------|
| Ambient temperature | -40°C to 66°C (-40°F to 151°F) |
| Relative humidity | 8%-95% (packaged) |
| Altitude | -1000 ft to 10,000 ft |
| Maximum wet bulb temperature | 46°C (115°F) |
| Temperature gradient | 20°C (68°F/hr) |

RZ26 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
- Determine what options your system has
- Shut down the system hardware
- Remove panels
- Attach the antistatic wrist strap

Chapter Overview

This chapter covers the following topics:

- Description of the RZ26 Drive
- Setting SCSI Address
- Installing the RZ26 Drive
- Removing an RZ26 Drive
- RZ26 Drive Specifications

Description of the RZ26 Drive

Capacity

The capacity of the RZ26 drive is 1.05 gigabytes.

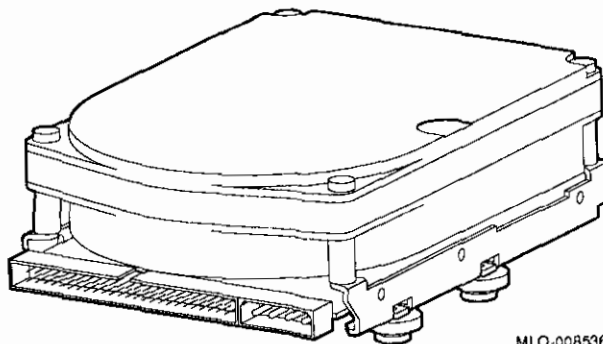
Purpose

The RZ26 drive can be used for storing applications and user files.

Illustration

The RZ26 fixed disk drive is shown in Figure 8-1.

Figure 8-1 RZ26 Fixed Disk Drive



MLO-008536

Setting SCSI Address

Address Jumpers

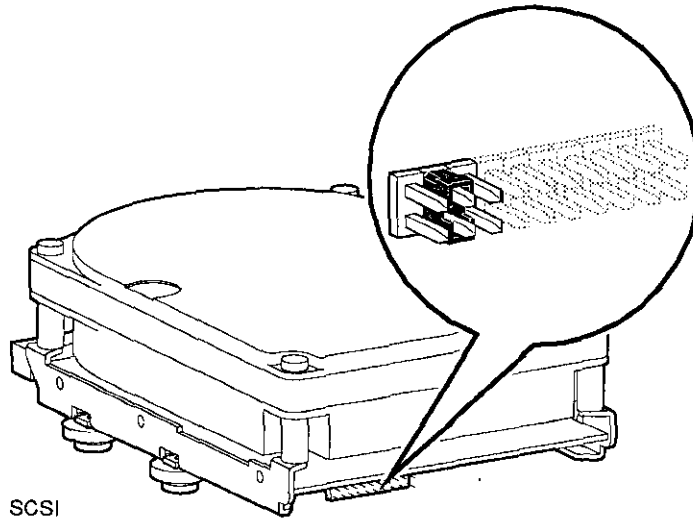
Before using the RZ26 drive, check the SCSI address jumpers to ensure that they are set for the desired address. Jumpers are removable electrical connectors. See Figure 8-2 for the location of these jumpers.

SCSI jumpers allow selection of a unique address for each SCSI drive. Figure 8-2 shows jumpers 0, 1, and 2 set for all SCSI addresses, including the recommended addresses of 0, 1, and 2. If your system does not contain a factory-installed fixed disk, the address of 3 should also be available. If using more than one fixed disk drive, select a unique SCSI address for each fixed disk drive. Figure 8-3 shows preferred addresses for given drive positions.

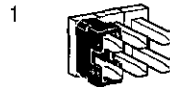
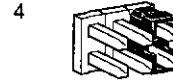
If the fixed disk drive was *not* factory-installed, it may have been shipped with *all* of the jumpers attached (to prevent loss of jumpers when shipping and unpacking). In this case, the address is set to 7, and you probably will need to change it.

When changing the default address, choose a new one from Figure 8-2 and carefully remove or replace jumpers accordingly. Save any SCSI jumpers you remove. You may need them later.

Figure 8-2 RZ26 SCSI Address Jumpers



SCSI
Address
Settings: 0



MLO-008537

**IMPORTANT:
Unique SCSI
Address**

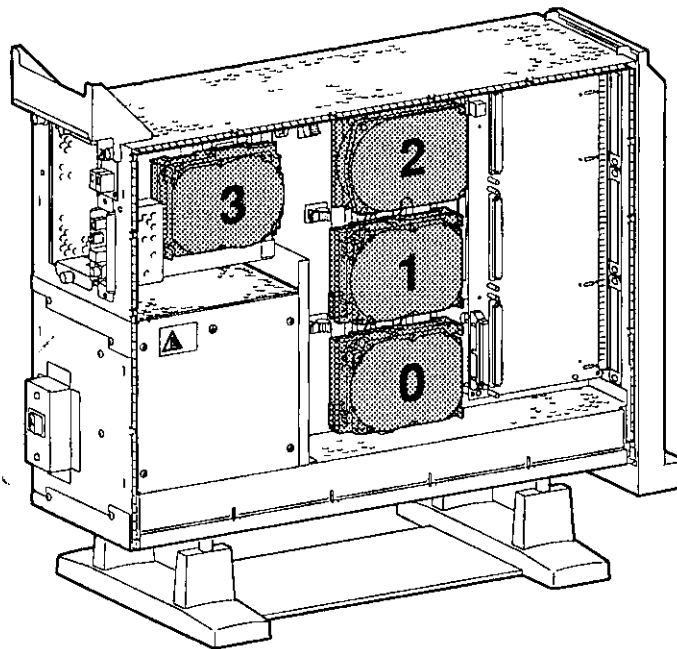
Each drive must have a unique SCSI address. Never set two or more drives to the same SCSI address; the system will not be able to communicate with the drives.

Installing the RZ26 Drive

Overview

Up to four fixed disk drives may be installed in the system. An RZ25 or RZ26 drive can be installed at any of the four drive positions, as shown in Figure 8-3. The numbers refer to the preferred SCSI addresses for given positions.

Figure 8-3 Fixed Disk Drive Positions.



MLO-007574

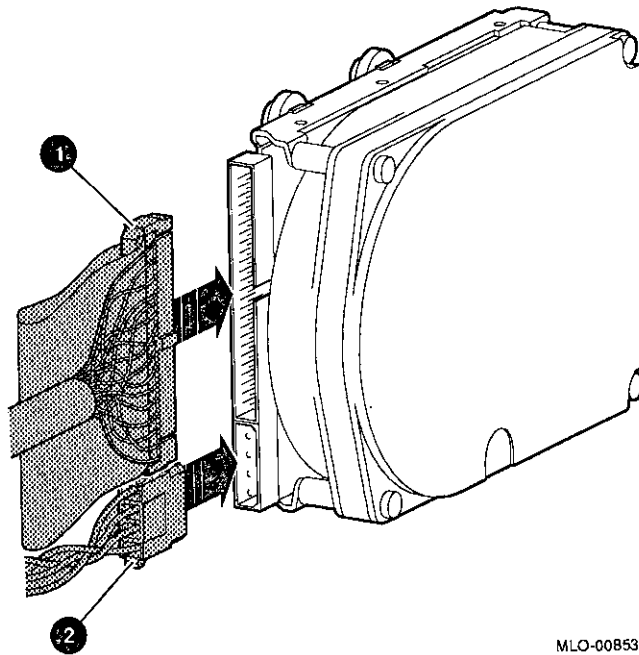
Installing the RZ26 Drive

To install an RZ26 drive, follow these steps:

Step 1: Connect Cables

Connect the SCSI ① and power ② connectors to the RZ26 disk drive, as shown in Figure 8-4. The connectors are keyed; make sure that they are oriented correctly before attempting to insert them into the drive.

Figure 8-4 Connecting RZ26 Cables

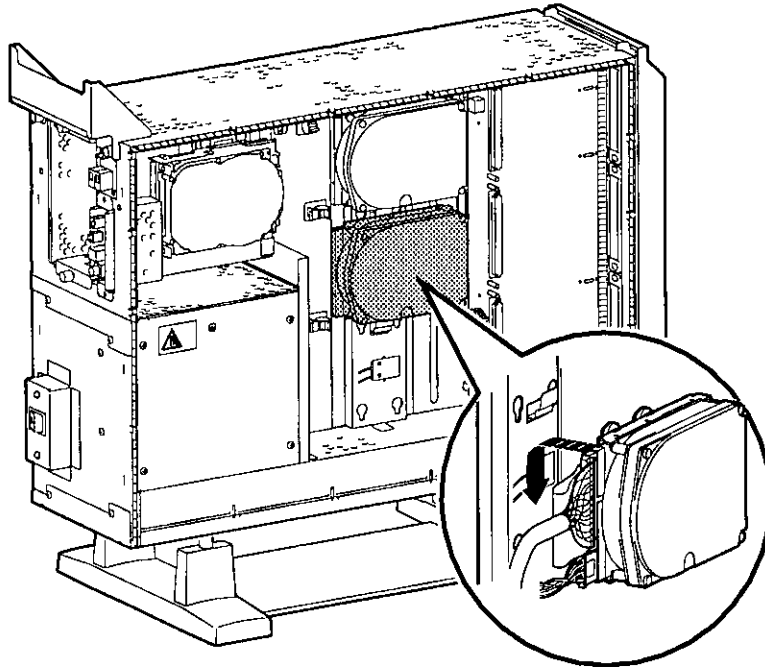


MLO-008539

**Step 2: Attach
Drive to System**

Orient the drive as shown in Figure 8-5, insert the knobs on the base of the drive into the holes in the mounting position, and slide the drive down until the latch engages.

Figure 8-5 Installing the RZ26 Drive



MLO-008538

Completion

This completes installation of the RZ26 fixed disk drive.

Installing the RZ26 Drive

Where to Go from Here

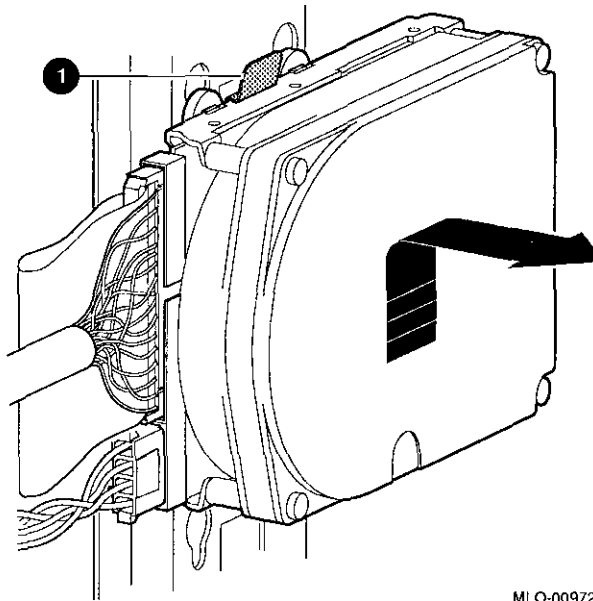
| If you... | Then... |
|--|--|
| Want to remove an RZ26 drive, | continue with the next section. |
| Have other options to add inside the system, | turn to the appropriate chapter. |
| Have <i>no</i> other options to add inside the system, | refer to Chapter 11 to restore and check the system. |

Removing an RZ26 Drive

Remove Drive from System Unit

To remove an RZ26 drive, press the latch **1** at the top of the drive, as shown in Figure 8-6, and slide the drive up and away from the system unit.

Figure 8-6 Removing the RZ26 Drive



MLO-009720

Disconnect Cables

Remove the power and SCSI cables from the drive.

RZ26 Drive Specifications

This section provides the following information:

- RZ26 Weight and Dimensions
- RZ26 Drive Formatted Storage Capacity
- RZ26 Drive Performance
- RZ26 Drive Operating Conditions
- RZ26 Drive Nonoperating Conditions

Table 8-1 RZ26 Weight and Dimensions

| Weight | Height | Width | Depth |
|--------------------|-----------------------|----------------------|----------------------|
| 0.9 kg (1.9 lb) | 4.13 cm (1.625 in) | 10.2 cm (4.00 in) | 14.6 cm (5.75 in) |

Table 8-2 RZ26 Drive Formatted Storage Capacity

| | |
|-----------------|---------|
| Per drive | 1050 MB |
| Per surface | 75 MB |
| Bytes per track | 29,640 |
| Buffer size | 512 KB |

Table 8-3 RZ26 Drive Performance

| | |
|----------------------------------|------------|
| Data transfer rate to/from media | 2.6 MB/sec |
| Seek time track to track | 1 msec |
| Seek time average | 10 msec |
| Seek time maximum (full stroke) | ≤ 20 msec |
| Average latency | 5.6 msec |
| Rotational speed | 5363 rpm |

Table 8-4 RZ26 Drive Operating Conditions

| | |
|---------------------|------------------------------|
| Ambient temperature | 10°C to 50°C (50°F to 122°F) |
| Relative humidity | 10%–90% |

Table 8-5 RZ26 Drive Nonoperating Conditions

| | |
|---------------------|--------------------------------|
| Ambient temperature | –40°C to 66°C (–40°F to 151°F) |
| Relative humidity | 8%–95% (non-condensing) |

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
- Determine what options your system has
- Shut down the system hardware
- Remove 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

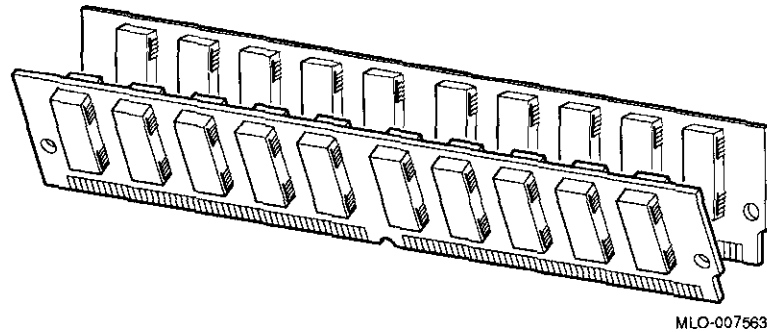
Determining What Modules You Need

Memory Module Sizes

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

Figure 9-1 shows 4-megabyte and 8-megabyte memory modules.

Figure 9-1 4-MB and 8-MB Memory Modules



System Memory

The basic system has 32 megabytes of memory (eight 4-MB modules installed). To increase the DEC 3000 AXP Model 500/500S system's memory capacity, you can order memory upgrades. When you order upgrade number MS15-CA, you will receive eight 4-MB modules. When you order upgrade number MS15-DA, you will receive eight 8-MB modules. For a particular memory configuration, see Table 9-1.

The DEC 3000 AXP Model 500/500S can hold a maximum of 256 megabytes (32 8-megabyte memory modules). Higher capacity memory modules may be available later.

**Configuration
Table**

Table 9-1 shows which modules need to be installed for a given total amount of memory.

Table 9-1 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 | 24 4-MB modules |
| 128 MB | Sixteen 8-MB modules |
| 128 MB | Sixteen 4-MB and Eight 8-MB modules |
| 128 MB | 32 4-MB modules |
| 160 MB | Eight 4-MB and Sixteen 8-MB modules |
| 192 MB | 24 8-MB modules |
| 192 MB | Sixteen 4-MB and Sixteen 8-MB modules |
| 224 MB | Eight 4-MB and 24 8-MB modules |
| 256 MB | 32 8-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 9-2).

**Memory From
Other Systems**

Do not attempt to use memory modules from any other system in the DEC 3000 AXP Model 500/500S. Other modules are *not* compatible with this system.

Before Installing

CAUTION: Memory Module Damage

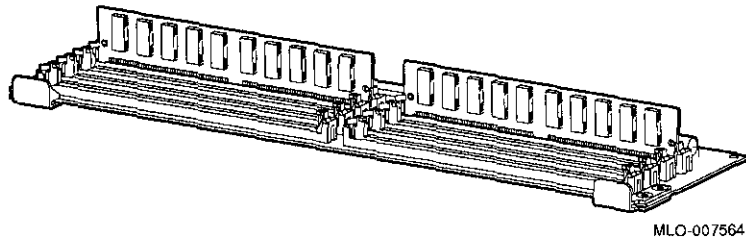
To avoid damage from static discharge after removing the left side panel and before opening the shipping bag for any memory module, and before touching anything inside the system, wear an antistatic wrist strap. See *Using an Antistatic Wrist Strap* in Chapter 2 for more information.

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 9-2 shows an MMB with two memory modules installed on it.

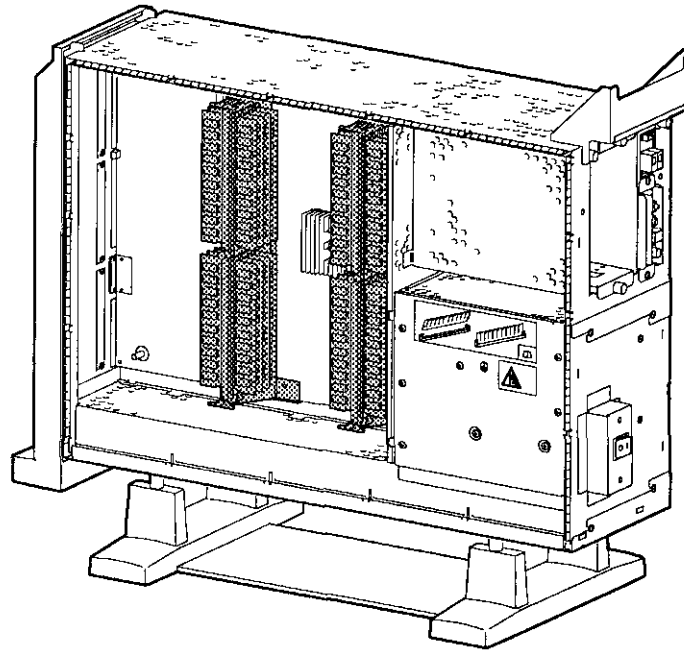
Figure 9-2 Memory Mother Board (MMB)



Where to Install

Figure 9-3 shows the location of MMBs with memory modules inside the system.

Figure 9-3 Location of MMBs and Memory Modules



MLO-007594

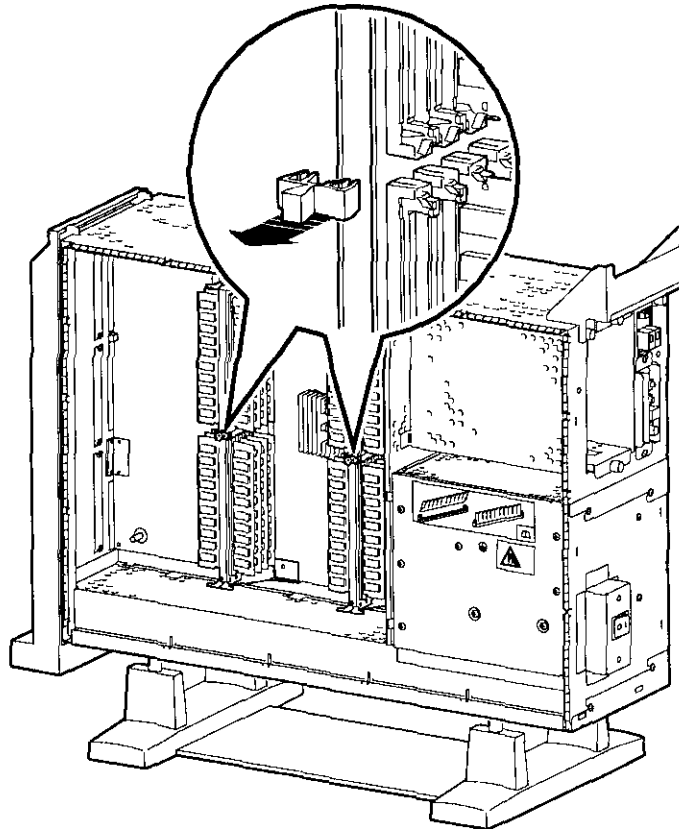
Installing Memory Modules

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 9-4.

Figure 9-4 Removing MMB Clips

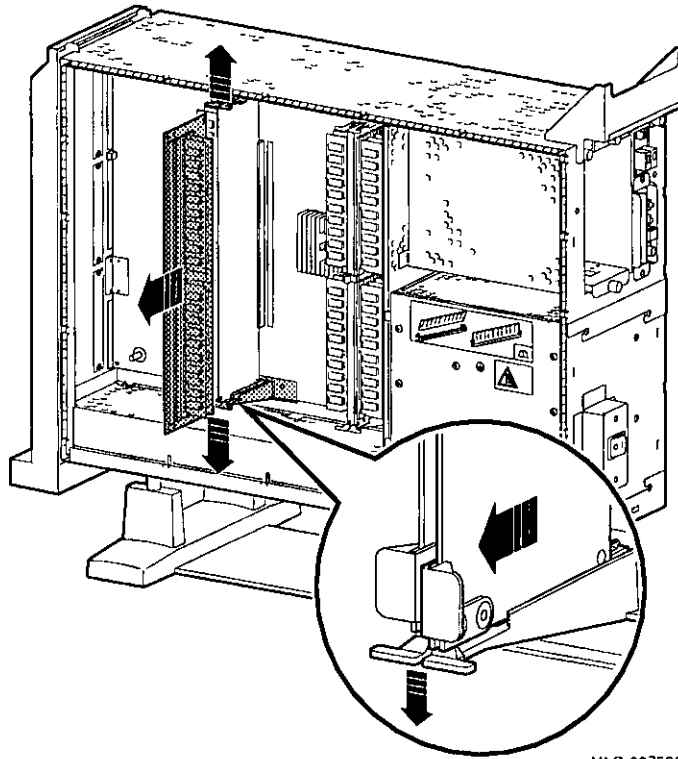


MLO-009808

**Step 2:
Remove MMBs**

Remove all four MMBs from their channels by releasing the catches and sliding the boards out, as shown in Figure 9-5.

Figure 9-5 Removing an MMB

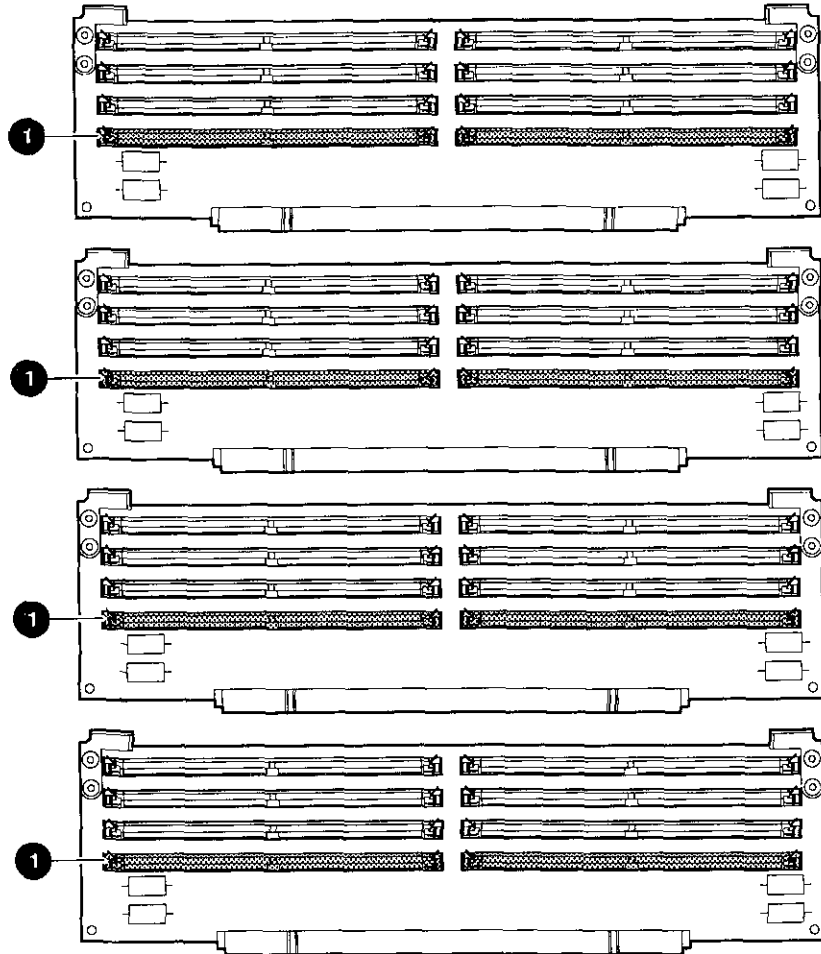


MLO-007565

**Step 3: Place
MMBs on
Protected
Surface**

Place the MMBs, with the connectors up, on a flat surface that is protected from *electrostatic discharge* (such as an anti-static mat), as shown in Figure 9-6.

Figure 9-6 Placing MMBs



MLO-009721

**Guidelines for
Installing**

The following guidelines should be used when installing memory modules:

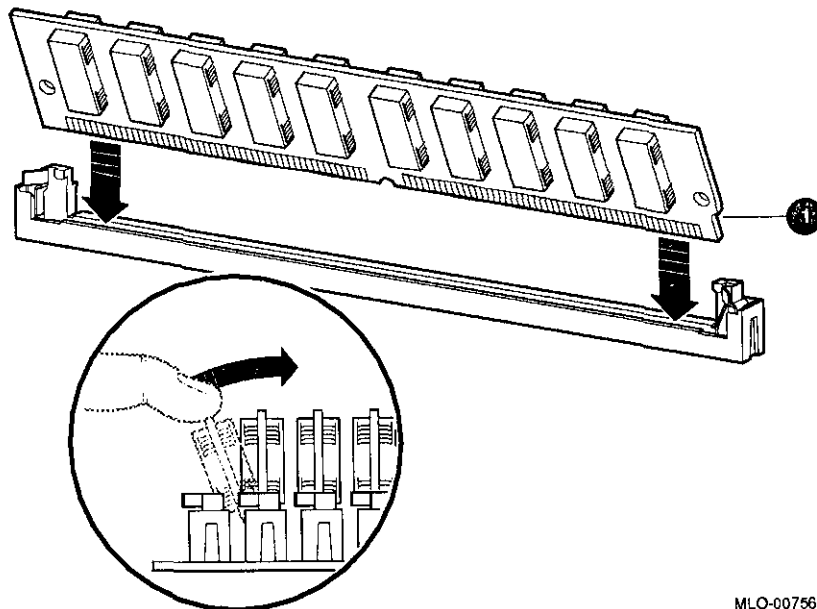
- Modules must be added in sets of eight, adding two modules to each of the four MMBs.

- 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 with the shaded areas in Figure 9-6.
- 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.

**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 9-7, 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 board is pushed vertically.

Figure 9-7 Installing a Memory Module



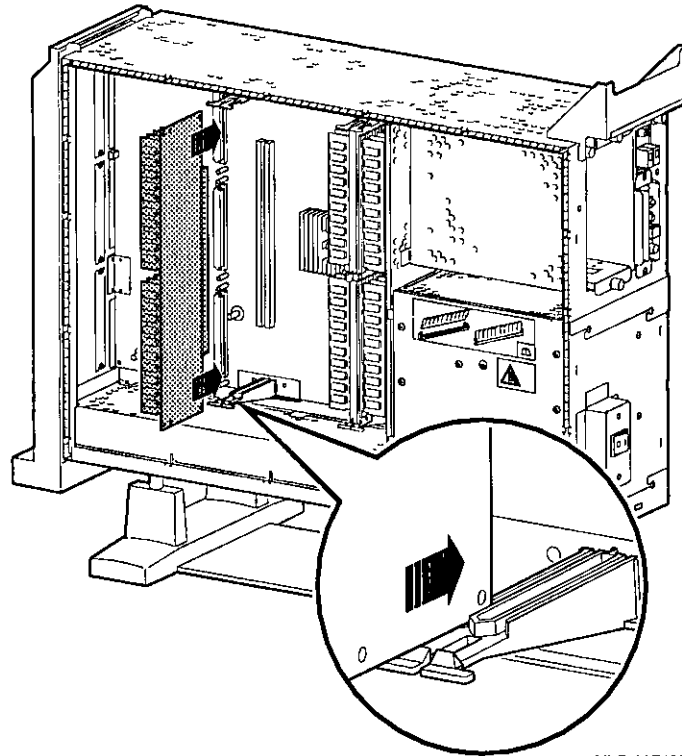
MLO-007566

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.

**Step 5: Install
MMBs**

Install the MMBs into the card guides in the side of the system, as shown in Figure 9-8. Make sure that the MMBs are firmly seated in their connectors, but do not force them.

Figure 9-8 Installing an MMB



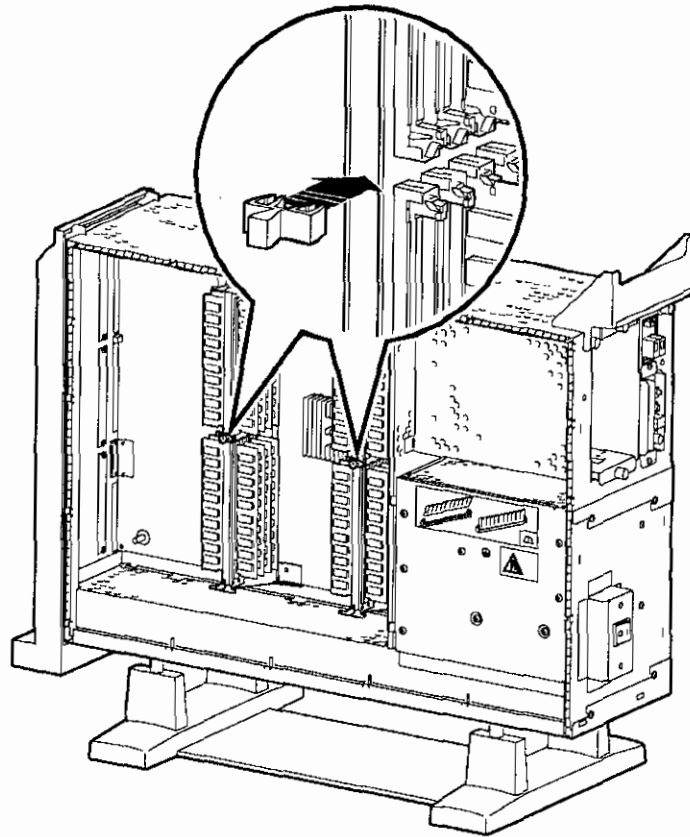
MLO-007568

Installing Memory Modules

Step 6: Install the MMB Clips

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

Figure 9-9 Installing MMB Clips



MLO-009840

Completion

This completes installation of the memory modules.

**Where to Go
from Here**

| If you... | Then... |
|--|---|
| Need to remove memory boards, | continue with the next section. |
| Have other options to add inside the system, | turn to the appropriate chapter. |
| Have <i>no</i> other options to add inside the system, | refer to Chapter 11 to replace the panels and check the system. |

Removing Memory Modules

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

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

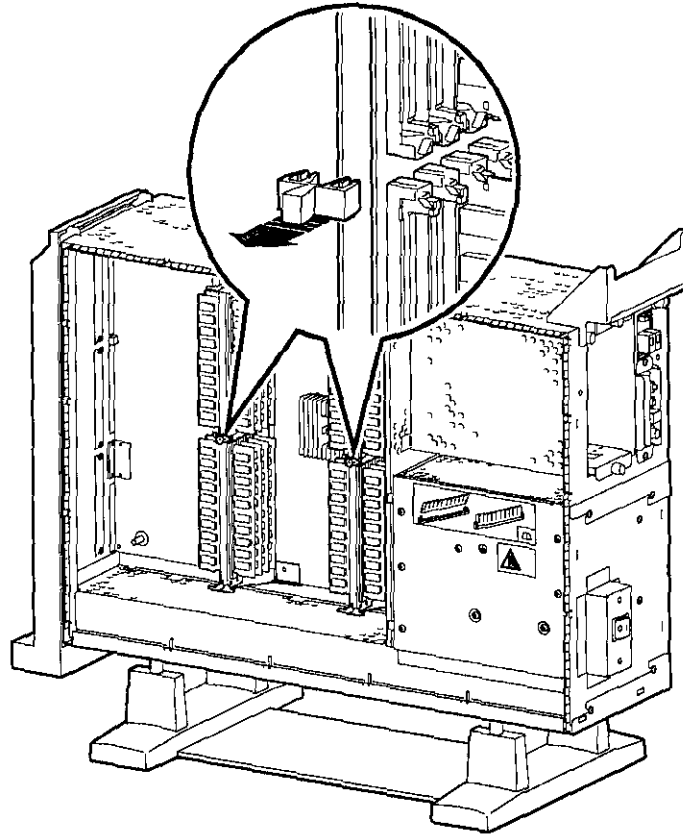
To remove memory modules, do the following steps.

Removing Memory Modules

Step 1: Remove the MMB Clips

Remove the two clips from the MMBs, as shown in Figure 9-10.

Figure 9-10 Removing MMB Clips

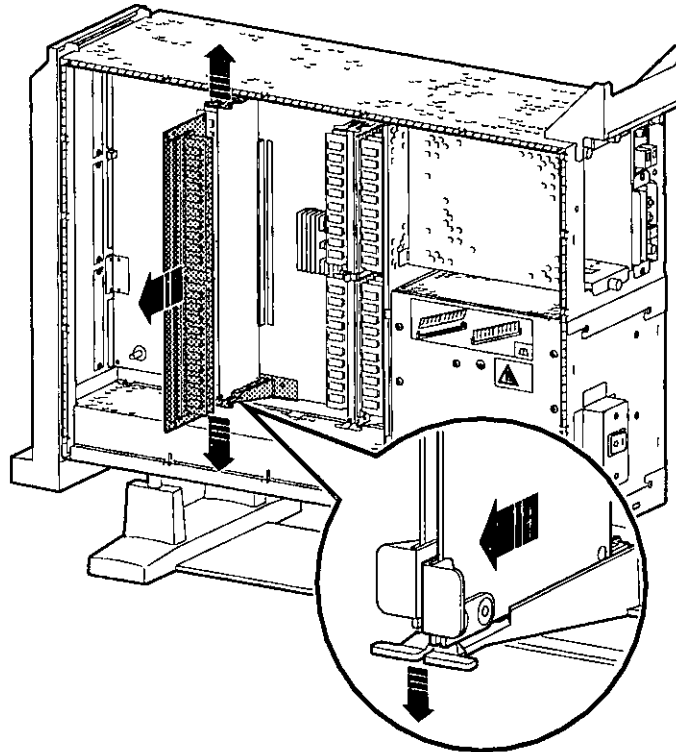


MLO-009608

**Step 2:
Remove MMBs**

Remove all four MMBs from their channels by releasing the catches and sliding the boards out, as shown in Figure 9-11.

Figure 9-11 Removing an MMB



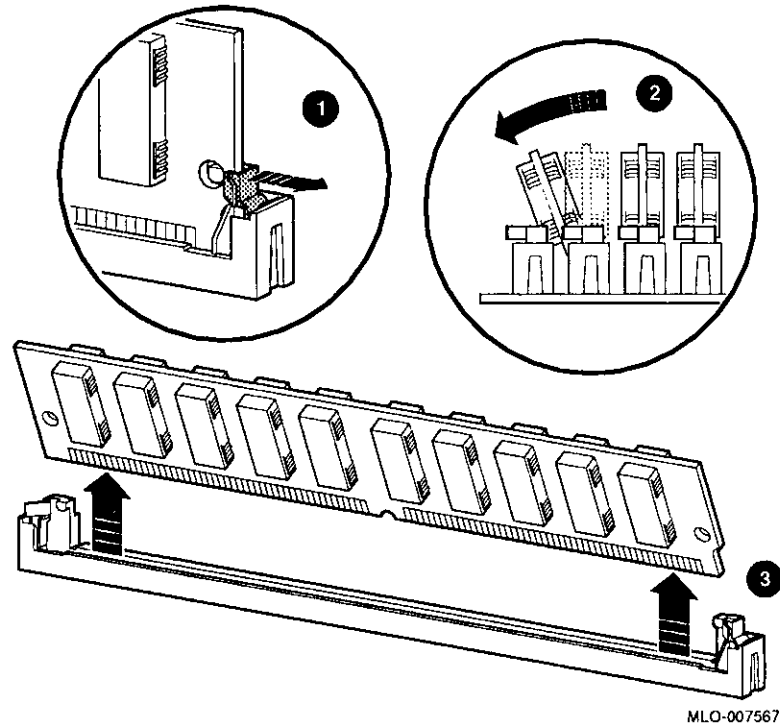
MLO-007565

Removing Memory Modules

Step 3: Remove Memory Modules

Remove the memory modules from the MMBs by releasing the metal clips at each end of the module, as shown in Figure 9-12. Start at the MMB slots with the highest numbers, and work toward the slots with the lowest numbers. Remove modules in sets of eight, removing two modules from corresponding slots on each of the four MMBs, as in the example shown in Figure 9-12.

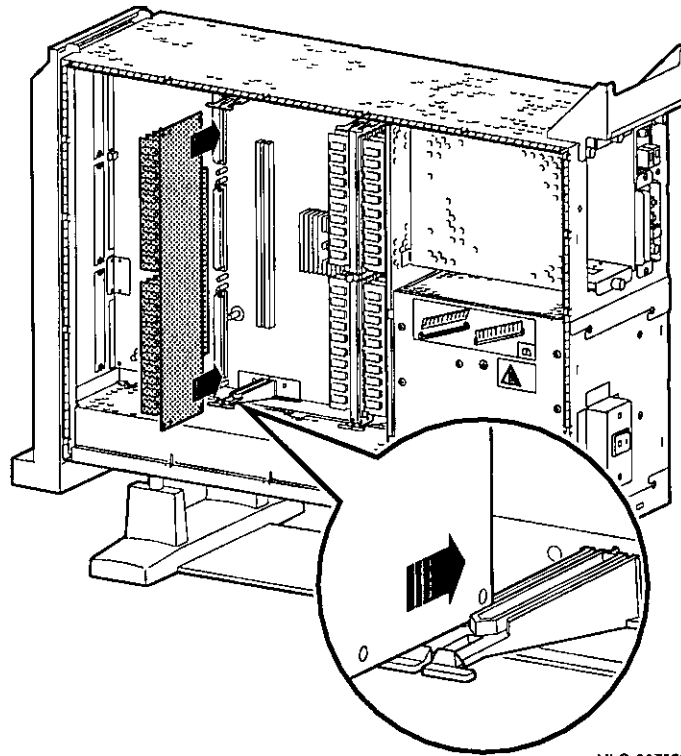
Figure 9-12 Removing a Memory Module



**Step 4: Replace
MMBs**

Place the MMBs back into the card guides in the side of the system, as shown in Figure 9-13. Make sure that the MMBs are firmly seated in their connectors, but do not force them.

Figure 9-13 Installing an MMB



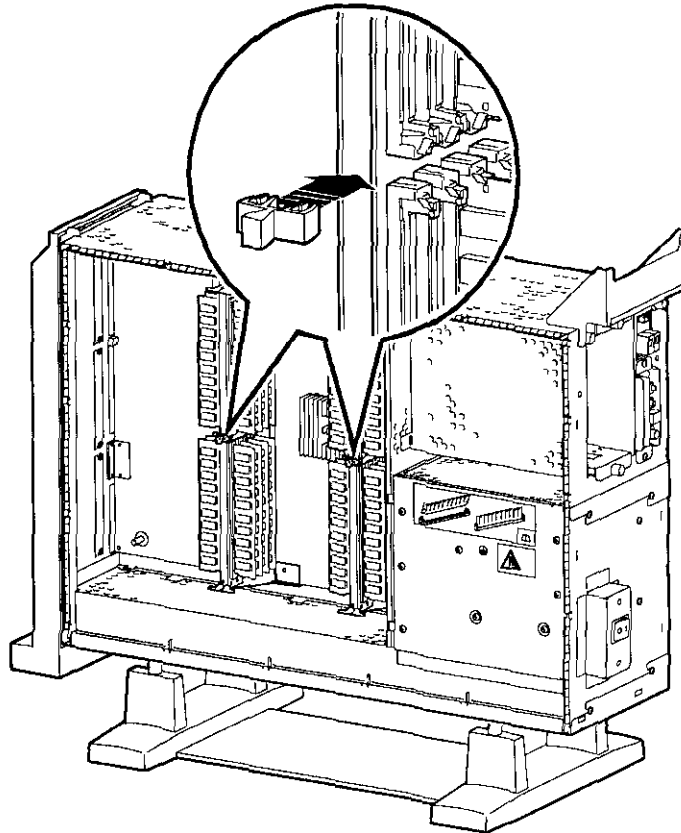
MLO-007568

Removing Memory Modules

Step 5: Install the MMB Clips

Install the two clips on the MMBs, as shown in Figure 9-14.

Figure 9-14 Installing MMB Clips



MLO-009840

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 the following TURBOchannel options:

- HX 2D Graphics Module (PMAGB-B)
- TX 2D Graphics Module (PMAGB-J)
- PXG+ 8-Plane 3D Graphics Module (PMAGB-D)
- 8-to-24 Plane Upgrade (PMAG-G)
- 24-Bit Z-Buffer Upgrade (PMAG-H)
- PXG+ 24-Plane 3D Graphics Module (PMAGB-E)

- PXG Turbo+ 3D Graphics Module (PMAGB-F)
- FDDIcontroller Module (DEFZA-A)
- AUI Ethernet Module (PMAD-A)
- Dual SCSI Module (PMAZB-A)

TURBOchannel Overview

What It Is

TURBOchannel is a high performance module interconnect technology that permits the use of graphics, multimedia and communications options. Table 10-1 gives an overview of the Digital TURBOchannel options that were available for your system when it first shipped. Others may be available later.

Table 10-1 Digital TURBOchannel Options

| Module | Purpose |
|-----------------------|-------------------------|
| HX (PMAGB-B) | 2D graphics |
| TX (PMAGB-J) | 2D graphics |
| PXG+ (PMAGB-D and -E) | 3D graphics |
| PXG Turbo+ (PMAGB-F) | 3D graphics |
| FDDI (DEFZA-A) | Communications |
| AUI Ethernet (PMAD-A) | Communications |
| Dual SCSI | Internal Communications |

Third-Party Options

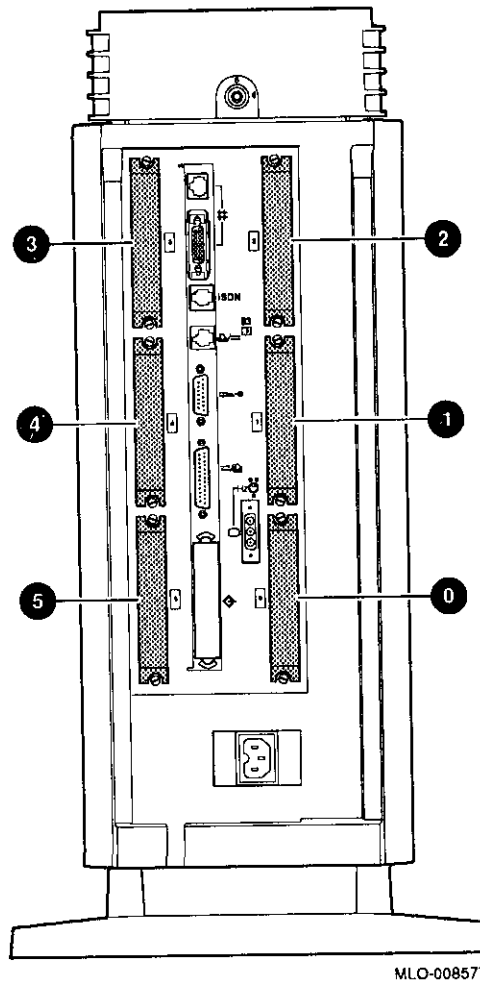
Although this chapter covers TURBOchannel option modules manufactured by Digital, other companies have developed modules that may be compatible with the DEC 3000 AXP Model 500/500S system. Digital's TRI/ADD program works with these third-party manufacturers to ensure compatibility with the TURBOchannel specification. Consult your Digital sales representative for more information.

**System
TURBOchannel
Slots**

The system unit has six TURBOchannel option module slots; three on the system module (on the left side of the system), and three on the I/O module (on the right side of the system), as shown in Figure 10-1.

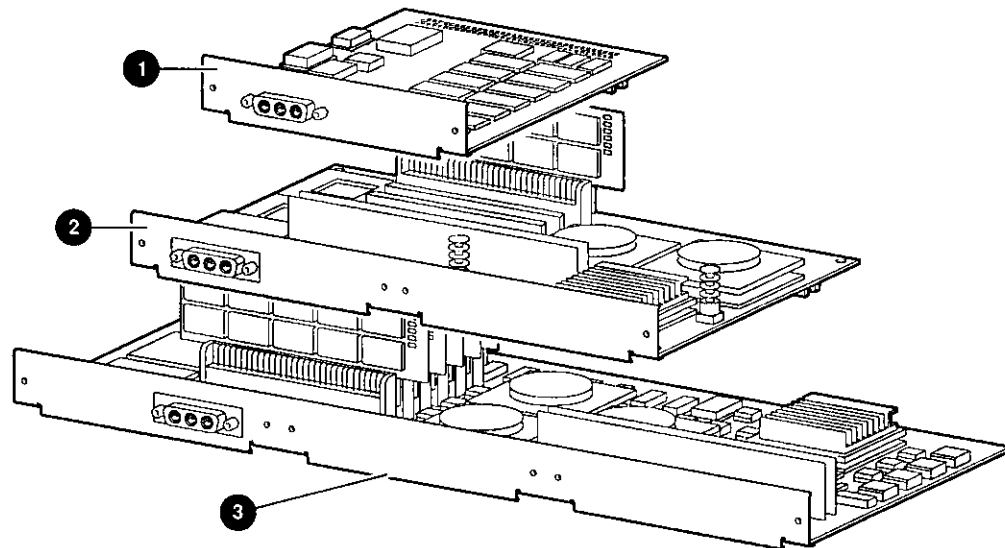
Note that, since Figure 10-1 shows the rear of the system, the left side of the system is on the right side of the figure (slots 0, 1, and 2), and the right side of the system is on the left side of the figure (slots 3, 4, and 5).

Figure 10-1 TURBOchannel Option Slots



The TURBOchannel option modules have different widths, each occupying 1 ①, 2 ②, or 3 ③ slots, as shown in Figure 10-2. All modules have identical connectors that connect to the system or the I/O modules, except for the 8-to-24 Plane Upgrade and 24-Bit Z-Buffer Upgrade options, which connect directly to the PXG+ module.

Figure 10-2 TURBOchannel Option Widths



MLO-009718

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.

IMPORTANT: Use Correct Documentation

If you are installing an option, note that the documentation shipped with that option may not cover installation in a DEC 3000 AXP Model 500/500S system. Use this chapter for installation and removal instructions.

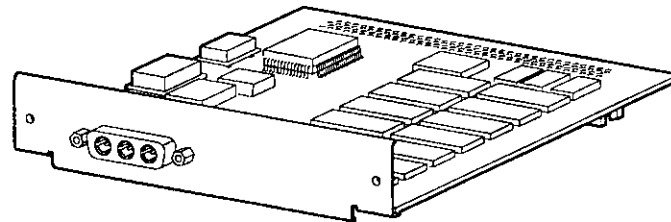
Description of Options

HX 2D Graphics Module

The HX 2D graphics module is the smart frame buffer (PMAGB-B) accelerator for multi-head systems, that is, systems that use more than one monitor. You will need one module for each additional 66 Hz or 72 Hz monitor. The DEC 3000 AXP Model 500/500S will support up to four monitors. The module occupies one slot in the system unit.

The module is shown in Figure 10-3. (See HX Module Jumper Setting, later in this chapter, for information on how to set the module jumper to select your monitor before installation.)

Figure 10-3 HX 2D Graphics Module



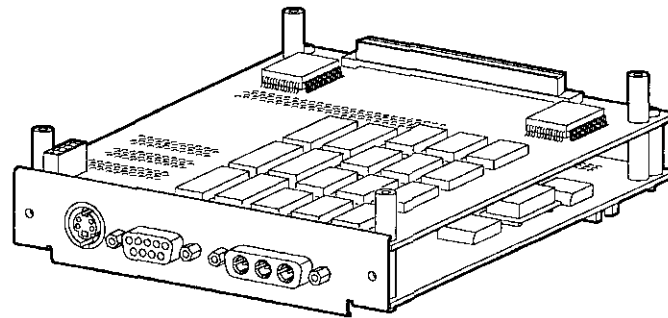
MLO-007572

TX 2D Graphics Module

The TX 2D graphics module is the 24-plane color frame buffer (PMAGB-J). This module is for multi-head systems, that is, systems that use more than one monitor. It occupies one slot in the system unit, and supports a 1280 x 1024, 72 Hz monitor (such as the VRT16, VRT19, or VR320).

The module is shown in Figure 10-4. (See TX Module Modification, later in this chapter, for information on how to modify the module before installation.)

Figure 10-4 TX 2D Graphics Module



MLO-009843

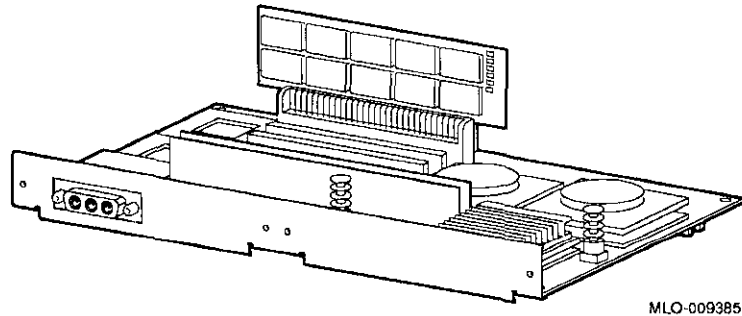
Description of Options

PXG+ 8-Plane 3D Graphics Module

The PXG+ 8-Plane 3D graphics module is the 8-plane (PMAGB-D) 3D accelerator. It occupies two adjacent slots in the system unit.

The module is shown in Figure 10-5.

Figure 10-5 PXG+ 8-Plane 3D Graphics Module



8-to-24 Plane Upgrade

The 8-to-24 plane upgrade kit (PMAG-G), plugs into the PXG+ module, not directly into the system, and is installed by Customer Service.

24-Bit Z-Buffer Upgrade

The 24-Bit Z-buffer upgrade kit (PMAG-H) plugs into the PXG+ module, not directly into the system.

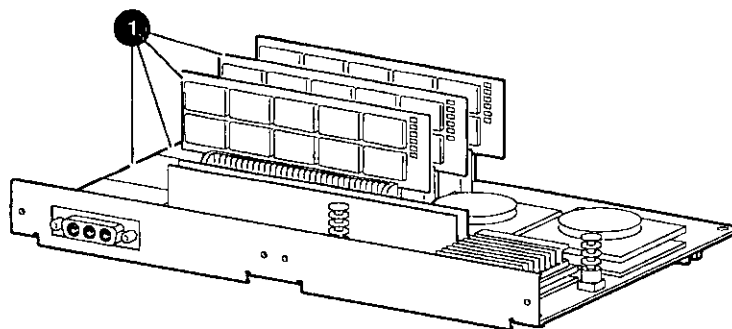
Description of Options

PXG+ 24-Plane 3D Graphics Module

The PXG+ 24-Plane 3D graphics module (PMAGB-E) is the 24-plane 3D accelerator with Z buffer. This is the same as the PXG+ 8-plane module with the upgrade kit and Z-buffer installed. It occupies two adjacent slots in the system unit.

The module is shown in Figure 10-6. The upgrade kit parts ❶ are noted in the figure.

Figure 10-6 PXG+ 24-Plane 3D Graphics Module



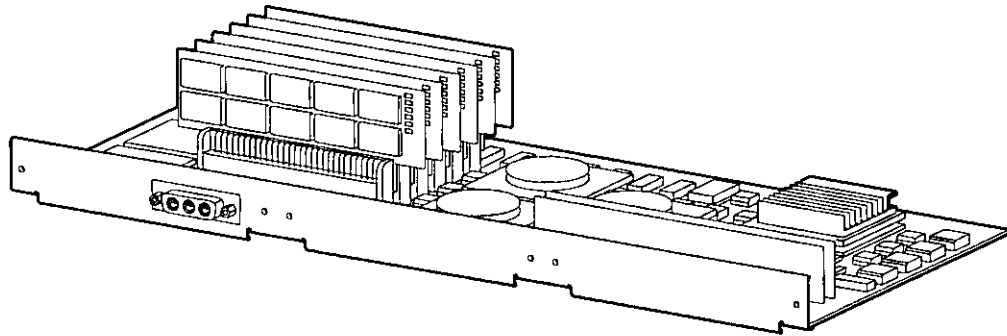
MLO-009386

**PXG Turbo+
3D Graphics
Module**

The PXG Turbo+ 3D graphics module (PMAGB-F) is a high-performance, 96-plane 3D graphics accelerator. It occupies three adjacent slots in the system unit, and supports 72 Hz monitors.

The module is shown in Figure 10-7.

Figure 10-7 PXG Turbo+ Graphics Module



MLO-008587

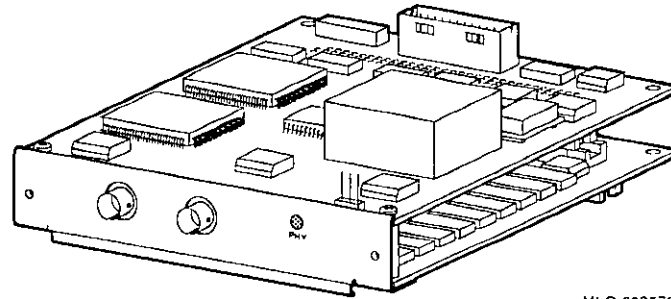
Description of Options

FDDIcontroller Module

The FDDIcontroller 700 communications adapter (DEFZA-A) provides standards-based network communications. It occupies one slot in the system unit.

The module is shown in Figure 10-8.

Figure 10-8 FDDIcontroller Module



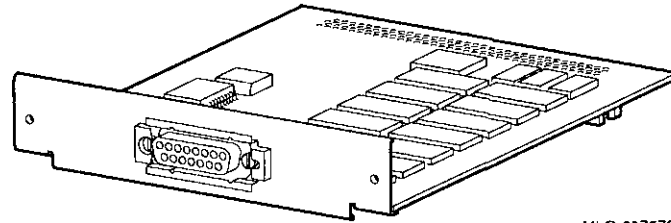
MLO-008575

**AUI Ethernet
Module**

The AUI Ethernet communications controller (PMAD-A) allows the system to connect to an AUI (thickwire) Ethernet network cable. It occupies one slot in the system unit.

The module is shown in Figure 10-9.

Figure 10-9 AUI Ethernet Module



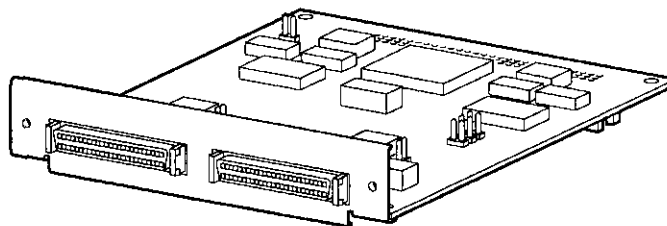
MLO-007573

**Dual SCSI
Module**

The Dual SCSI (PMAZB-A) adapter is a TURBOchannel-to-SCSI controller that provides two additional 8-bit, 5-MB/sec SCSI ports. It occupies one slot.

The module is shown in Figure 10-10.

Figure 10-10 Dual SCSI Adapter Module



MLO-009706

Before Installing Modules

Before installing certain modules, you may need to make sure that jumpers are set correctly or remove mechanical spacers. These procedures are explained in the following sections.

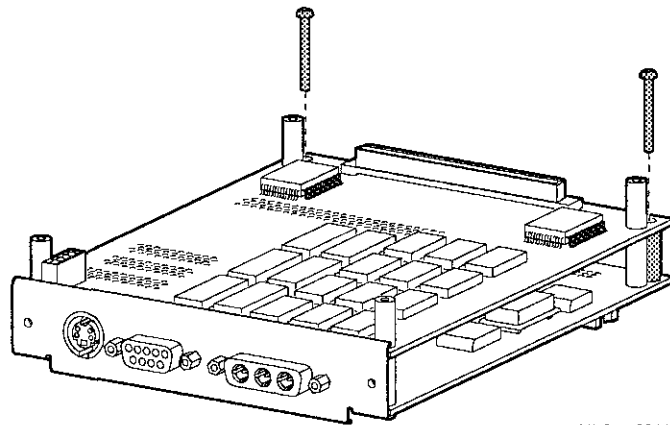
HX Module Jumper Setting

Refer to the documentation that came with your HX module for setting the module jumper for your monitor.

TX Module Modification

Before installing a TX module, remove the screws and spacers on the rear corners of the module, the shaded items shown in Figure 10–11. Be careful to remove only the corner screws and spacers, not the ones adjacent to the corner spacers.

Figure 10–11 TX Module Modification

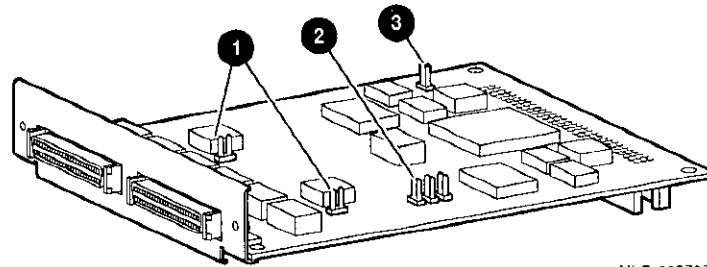


MLO-009844

**Dual SCSI
Module
Jumpers**

Before installing a Dual SCSI module, make sure that the jumpers are set correctly. Referring to Figure 10-12, make sure that the terminator jumpers **1** are in place. Make sure that the flash memory write jumper **3** is removed. The jumper rest **2** is for storing up to three unused jumpers.

Figure 10-12 Dual SCSI Module Jumpers



ML0-009707



Installation

Choosing a TURBOchannel Slot

The TURBOchannel modules plug directly into either the CPU module (3 slots) or the I/O module (3 slots). See Figure 10-1.

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.

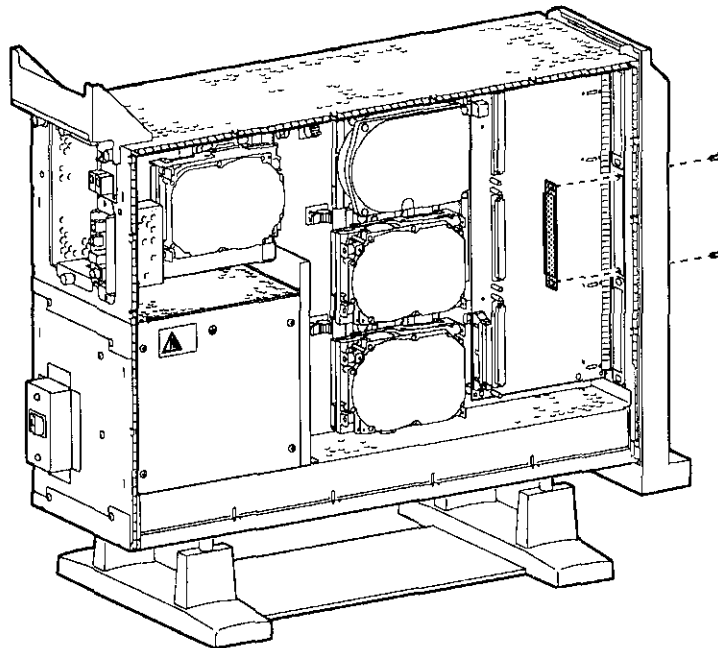
Installation Procedure

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.

3. Remove the two screws and metal plate at the chosen slot or slots, as shown in Figure 10-13. Save the plate, in case you remove a module later. Save the screws for attaching the new module to the system cabinet.

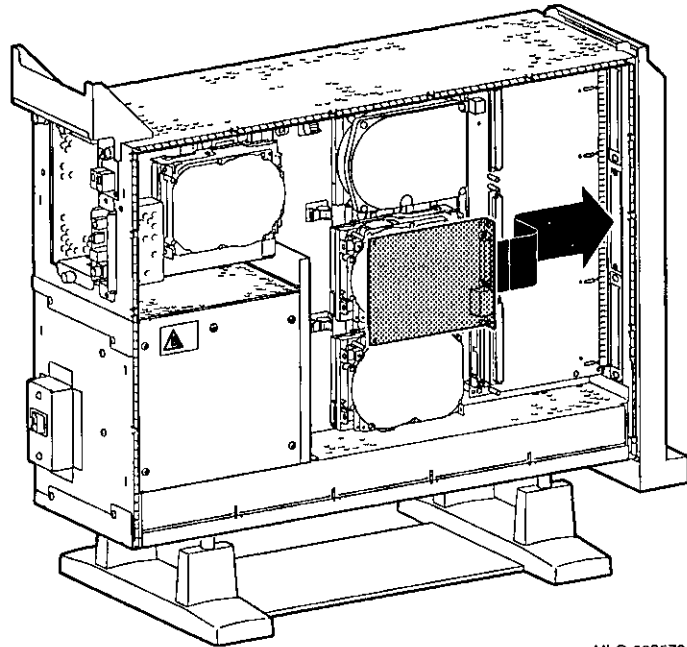
Figure 10-13 Removing a Slot Plate



MLO-008578

4. Orient the new module as shown, inserting the module port through the slot, as shown in Figure 10-14.

Figure 10-14 Seating a TURBOchannel Module

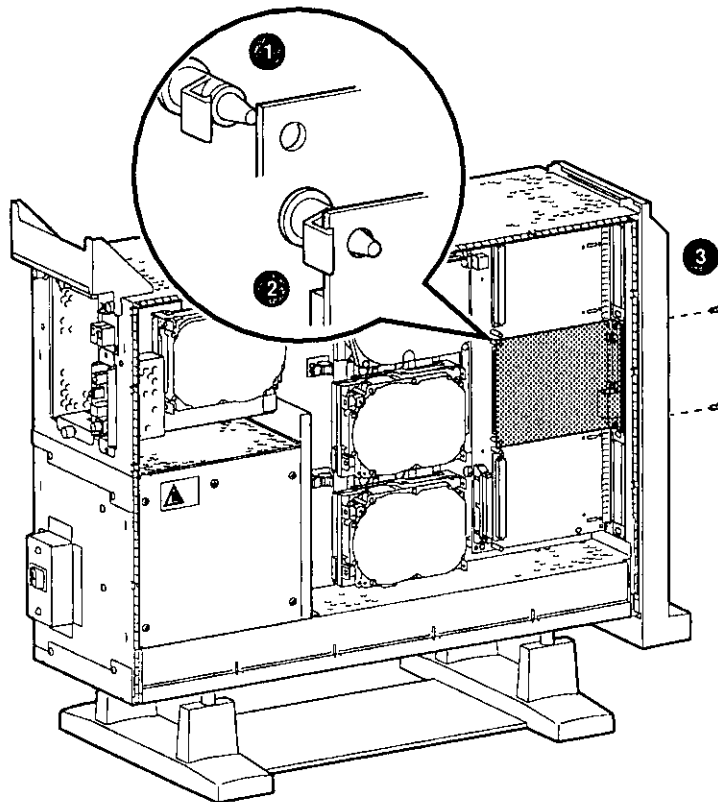


MLO-008579

5. Press the corners of the module over the mounting pins ❶, seating the module connector with the connector on the system board or I/O module, as shown in Figure 10-15. When the module is seated, the pin latches ❷ will hold the module in place. Secure the module, using two screws for every slot ❸.

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

Figure 10-15 Securing a TURBOchannel Module



MLO-008580

Completion

This completes installation of a TURBOchannel module.

**Where to Go
from Here**

| If you... | Then... |
|--|---|
| Need to remove a TURBOchannel module, | continue with the next section. |
| Want to connect cables to a newly-installed module, | refer to your owner's guide. |
| Have other options to add inside the system, | turn to the appropriate chapter. |
| Have <i>no</i> other options to add inside the system, | refer to Chapter 11 to replace panels and check the system. |

Removing a TURBOchannel Module

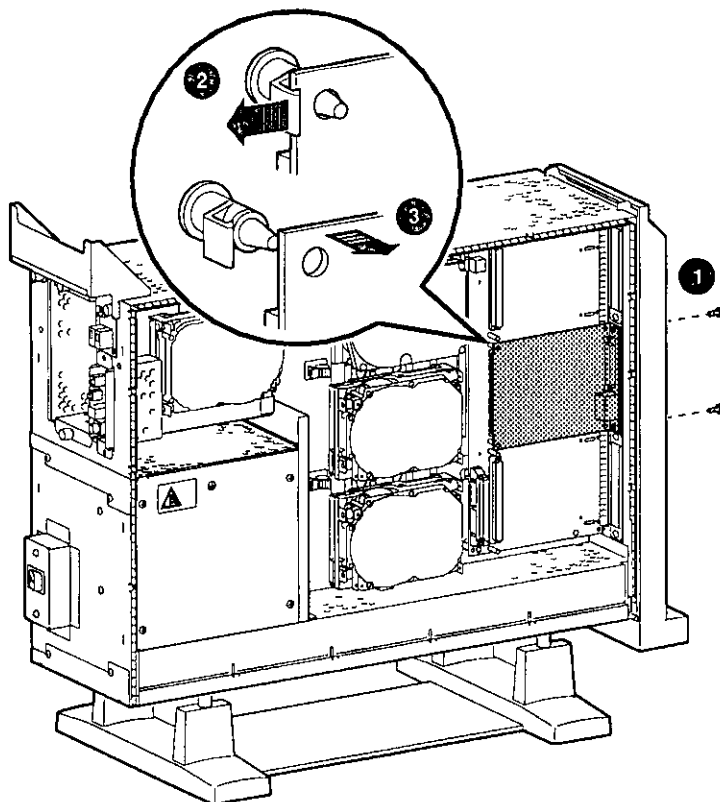
To remove a TURBOchannel module, follow these steps:

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 10-16.

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 10-16. If you are removing a PXG Turbo+ module, you may need assistance in releasing the six latches simultaneously and pulling the module away from the system or I/O module.

Figure 10-16 Removing a Module

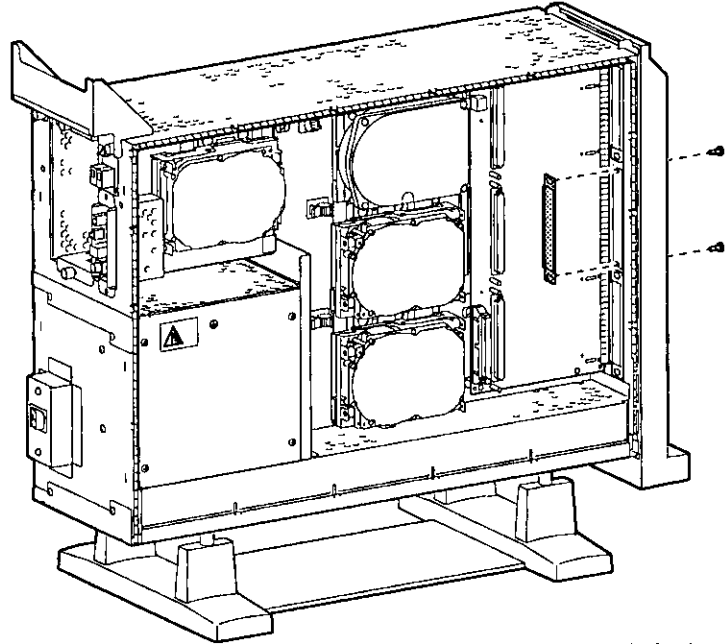


MLO-008581

6. Remove the module from the system box.

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

Figure 10-17 Replacing a Slot Plate



MLO-008578

Completion

This completes removal of a TURBOchannel module.

Restoring the System

Chapter Overview

This chapter covers the following topics:

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

Storing 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.

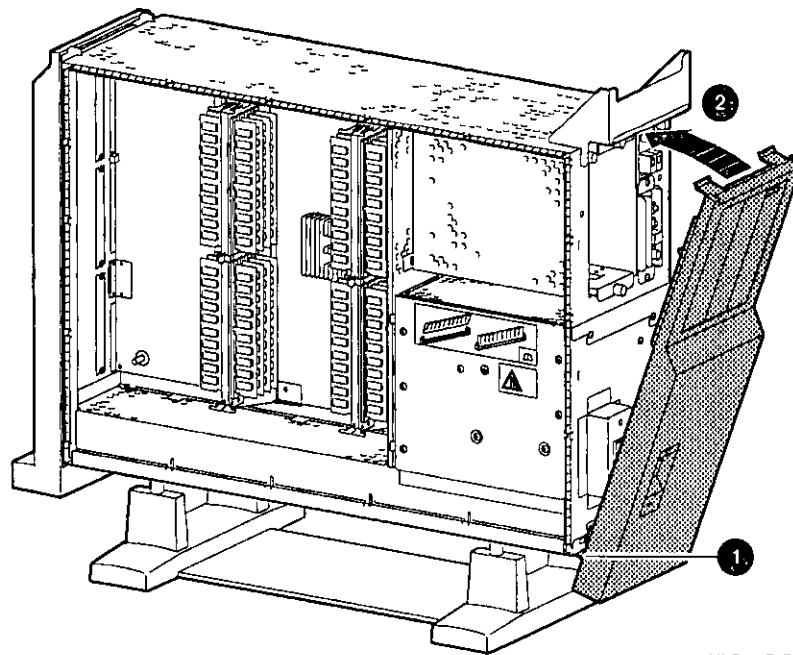
Replacing Panels

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 11-1.

Figure 11-1 Replacing the Front Panel

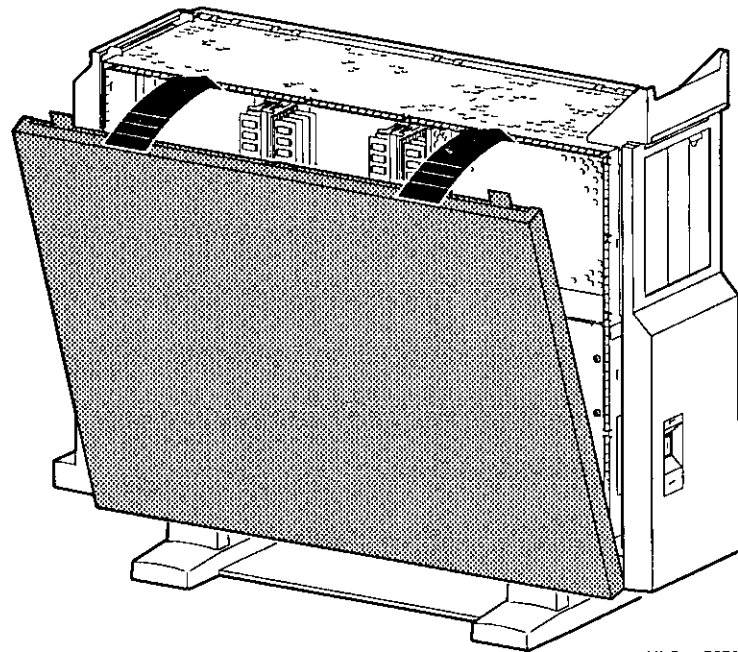


MLO-007575

**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 11-2.

Figure 11-2 Replacing the Left Side Panel



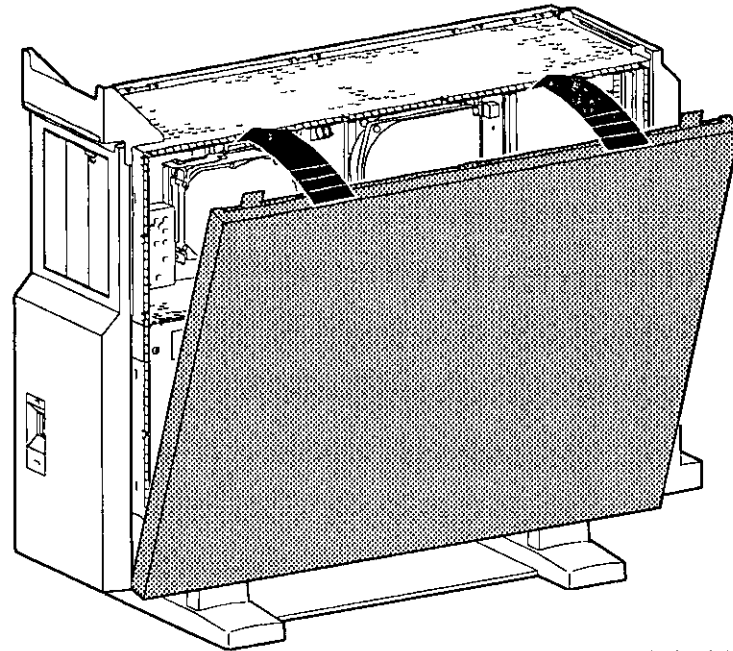
MLO-007576

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 11-3.

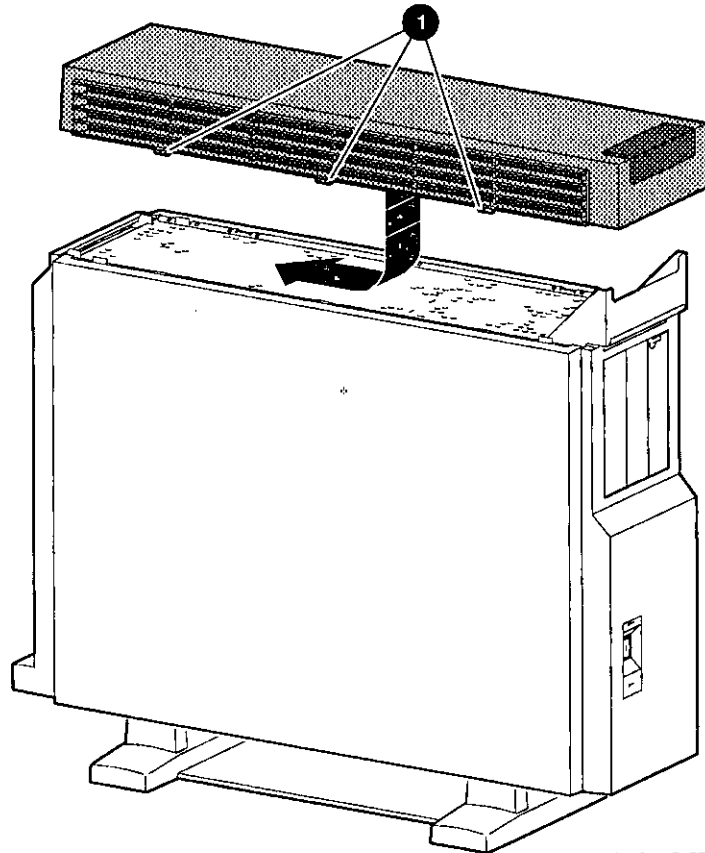
Figure 11-3 Replacing the Right Side Panel



MLO-007591

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 11-4. Make sure that the hooks **1** face the rear, and that the lock on the cover is toward the rear of the system.

Figure 11-4 Replacing the System Cover

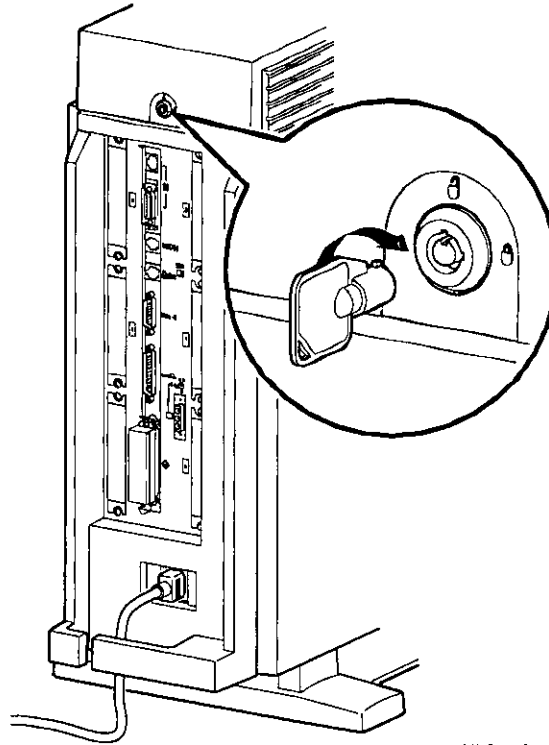
MLO-007577

Replacing Panels

Step 5: Lock Cover

Lock the system cover, as shown in Figure 11-5.

Figure 11-5 Locking the System Cover



MLO-007590

Restarting and Testing the System

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 you 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 AXP Model 500/500S Owner's Guide* for an explanation of common error messages and for more information about testing the system.

Testing Drive Installation

To make sure that the drives are connected correctly, enter the `show dev` commands 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 dev` display identify an error in a drive. If any error messages appear, write them down.

If your display shows many lines with the same address in the `ADDR` column, 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 mem` 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` commands 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.

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 AXP Model 500/500S Owner's Guide*, or contact your Digital service representative.

External Options

Chapter Overview

This chapter gives a brief overview of the following external options:

- Console Terminal
- Dial Box
- Headset
- Modem
- Printer
- Programmable Function Keyboard (Button Box)
- Storage Expansion Box
- Tablet

Adding these options does not involve opening the system unit.

Future Options

The previous list represents the external options available when the DEC 3000 AXP Model 500/500S first shipped. Other options may be available at a later time.

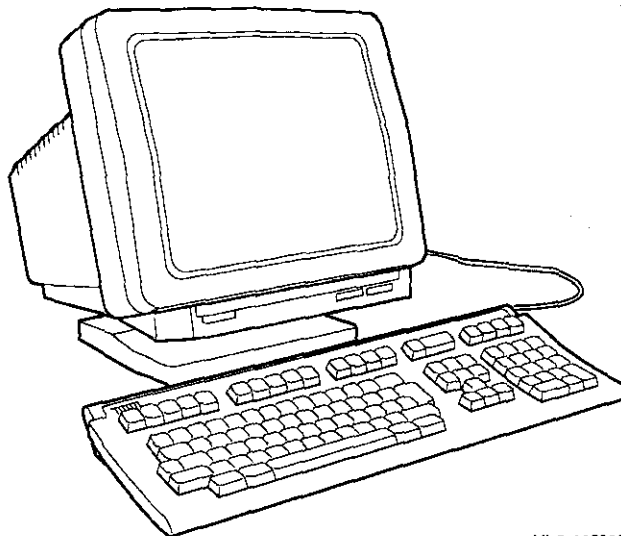
For More Information

For specific information on installing and using these external options, consult the documentation that is shipped with the option, or contact your Digital sales representative.

Console Terminal

A console terminal (VT420) is available for your DEC 3000 AXP Model 500S. See Figure 12-1.

Figure 12-1 Console Terminal

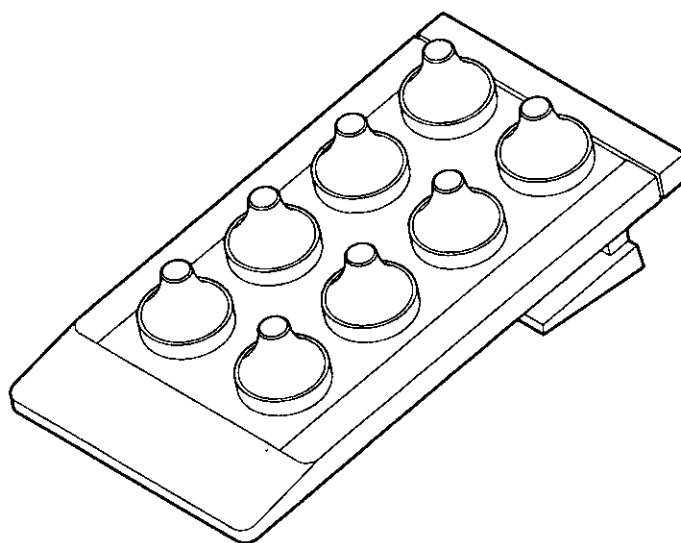


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Dial Box

The dial box (VSX30-AA), shown in Figure 12-2, is for special graphics applications on the DEC 3000 AXP Model 500. It contains eight dials, each of which turns a continuously variable potentiometer. Each potentiometer is connected to an analog-to-digital converter. This option is compatible with the DEC OSF/1 operating system only.

Figure 12-2 Dial Box



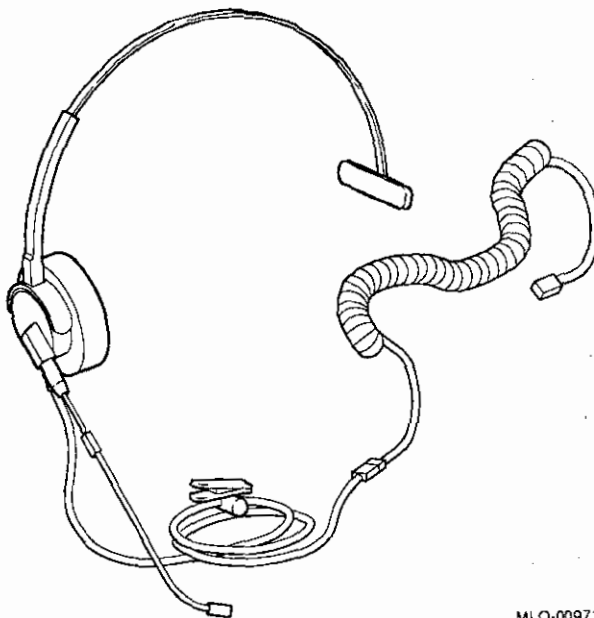
MLO-005936

The dial box is also available with the programmable function keyboard as VSX10-AA.

Headset

The headset (VSXXX-JA), shown in Figure 12-3, is for audio input and output.

Figure 12-3 Headset



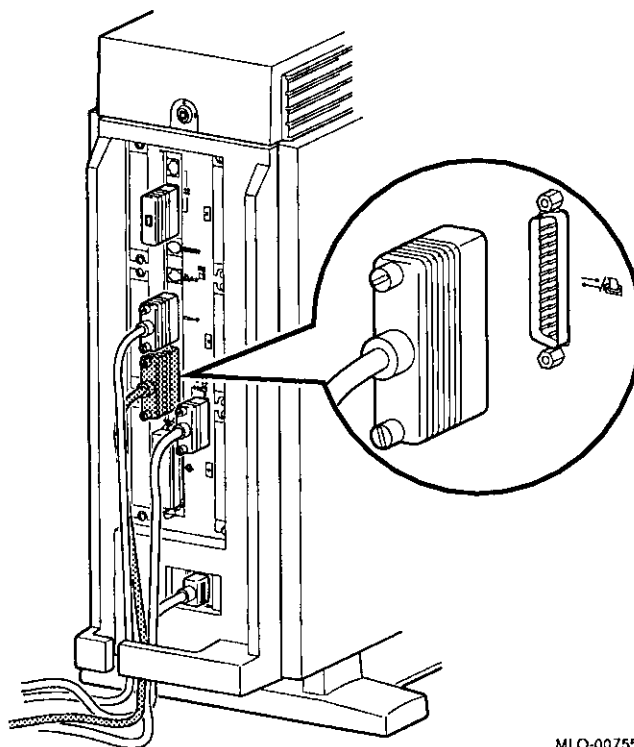
MLO-009714

Modem

A modem converts computer signals into signals that can be sent over a telephone line. Many modems will work with your DEC 3000 AXP Model 500/500S system. Contact your Digital sales representative for more information.

Figure 12-4 shows the port for connecting a modem cable to the DEC 3000 AXP Model 500/500S system unit.

Figure 12-4 Connecting a Modem Cable



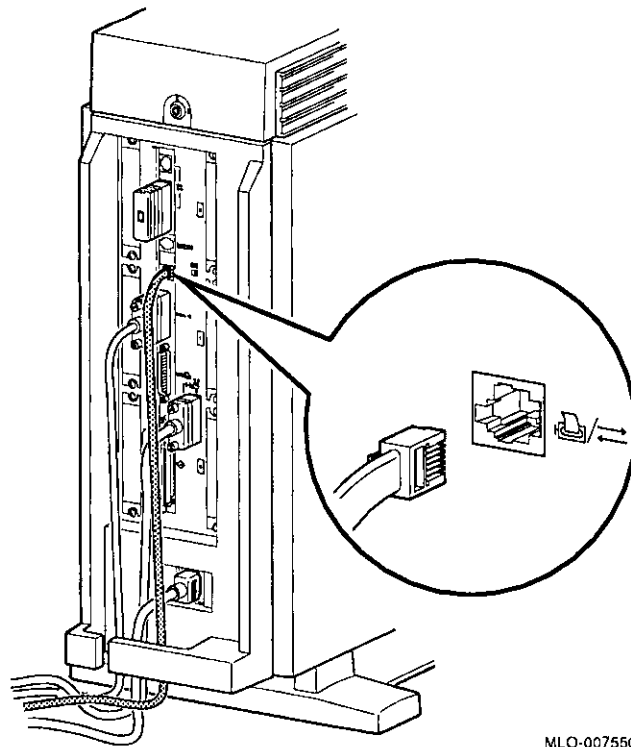
MLO-007551

Printer

Many printers will work with your DEC 3000 AXP Model 500 /500S system. Contact your Digital sales representative for more information.

Figure 12-5 shows the port for connecting a printer cable to the DEC 3000 AXP Model 500 system unit. The DEC 3000 AXP Model 500S uses an adapter and the port shown in Figure 12-4, as the port shown in Figure 12-5 is used by the console terminal.

Figure 12-5 Connecting a Printer Cable

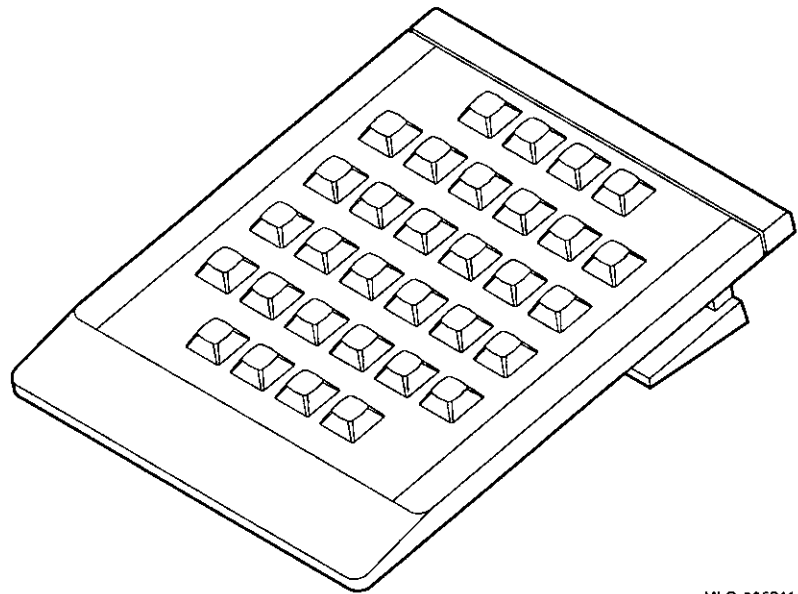


MLO-007550

Programmable Function Keyboard (Button Box)

The programmable function keyboard (button box, VSX20-AA), shown in Figure 12-6, is for special graphics applications on the DEC 3000 AXP Model 500. This device contains an array of 32 lighted momentary-contact pushbutton switches. This option is compatible with the DEC OSF/1 operating system only.

Figure 12-6 Programmable Function Keyboard (Button Box)



MLO-005941

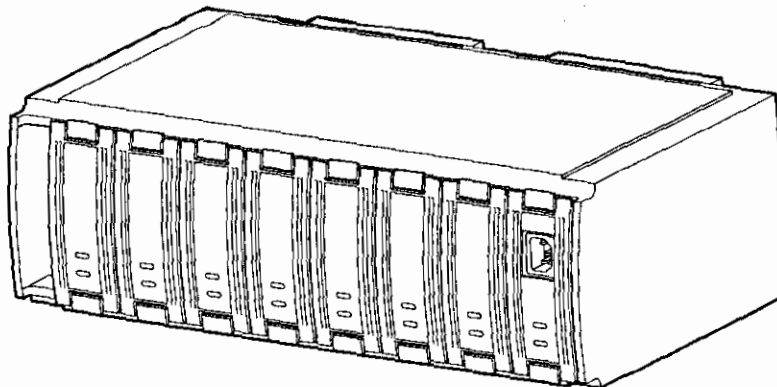
The programmable function keyboard is also available with the dial box as VSX10-AA.

Storage Expansion Box

The DEC 3000 AXP Model 500/500S system is designed to operate with the DECstor/me (BA350-SA) expansion box, shown in Figure 12-7. This expansion box will allow the use of seven additional half-height drives, including the RZ25, RZ26, and TLZ06 drives. An optional pedestal mounting kit (BA350X-FA) is available for the DECstor/me (BA350-SA) expansion box.

For more information on this box and available options for it, see your Digital sales representative.

Figure 12-7 DECstor/me (BA350-SA) Expansion Box

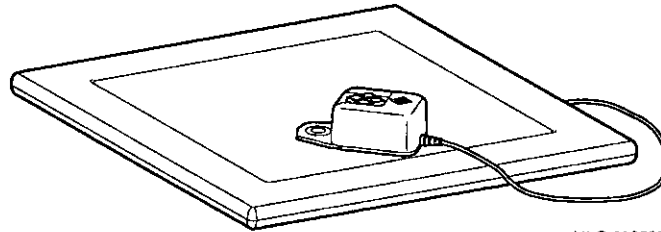


MLO-009841

Tablet

You can use either the standard mouse or an 11-by-11-inch tablet (VSXXX-AB) with a puck and pen pointers. See Figure 12-8.

Figure 12-8 Tablet



MLO-008589

The tablet is connected to the mouse port on the mouse/keyboard cable.

A

Associated Documents

For option and system hardware part numbers, consult your Digital sales representative.

Not all the following documents are available in every country. Check with your Digital sales representative for availability.

Table A-1 lists the DEC 3000 AXP Model 500/500S online documents available on compact disc (Bookreader). Table A-2 lists the associated documents available in printed form.

Table A-1 DEC 3000 AXP Model 500/500S Bookreader Documents

Titles

DEC 3000 AXP Model 500/500S Owner's Guide

DEC 3000 AXP Model 500/500S Quick Installation Card

DEC 3000 AXP Model 500/500S Options Guide

DEC 3000 AXP Model 500/500S Technical Summary

Table A-2 Associated Printed Documents

| Titles | Order Numbers |
|---|----------------------|
| DEC 3000 AXP Model 500/500S | |
| <i>DEC 3000 AXP Model 500/500S Owner's Guide</i> | EK-FLAMI-OG |
| <i>DEC 3000 AXP Model 500/500S Quick Installation Card</i> | EK-FLAMI-IC |
| <i>DEC 3000 AXP Model 500/500S Options Guide</i> | EK-FLAMI-IG |
| <i>DEC 3000 AXP Model 500/500S Technical Summary</i> | EK-FLMNG-TM |
| TURBOchannel-related Documentation (written for DECstation 5000) | |
| <i>Smart Frame Buffer TURBOchannel Module</i> | EK-SFBOM-TC |
| <i>The High Three-Dimensional (3D) Graphics TURBOchannel Module</i> | EK-H3DOM-TC |
| <i>The Low Three-Dimensional (3D) Graphics TURBOchannel Module</i> | EK-L3DOM-TC |
| <i>The ThickWire Ethernet TURBOchannel Module</i> | EK-TWETH-TC |
| <i>TURBOchannel Extender Operator's Guide</i> | EK-PM32X-EX |
| <i>TURBOchannel Extender (TCE) Option Module</i> | EK-TCEIM-TC |
| <i>SCSI TURBOchannel Option Installation Kit</i> | EK-PMAZA-UG |
| <i>FDDIcontroller 700-C Installation</i> | EK-DEFZA-CI-PRE/A |
| <i>FDDIcontroller 700 Software Product Description</i> | AE-PE9MD-TE |
| <i>FDDIcontroller 700 Release Notes</i> | AA-PJKWA-TE |
| DECmedia Documentation | |
| <i>DECmedia User Guide</i> | EK-DECME-UG |
| Service Documentation | |
| <i>DEC 3000 AXP Model 500/500S Pocket Service Information</i> | EK-FLAMI-SV |

(continued on next page)

Table A-2 (Cont.) Associated Printed Documents

| Titles | Order Numbers |
|---|----------------------|
| Drives | |
| <i>RRD42 Disc Drive Owner's Manual</i> | EK-RRD42-OM |
| <i>RX26 Owner's Reference Card</i> | EK-RX26D-RC |
| <i>TLZ06 Cassette Tape Drive owner's Manual</i> | EK-TLZ06-OM |
| <i>TZK10 Cartridge Tape Drive Owner's Guide</i> | EK-TZK10-OG |
| <i>RZ Series Disk Drive Subsystem Pocket Service Guide</i> | EK-RZXXD-PS |
| <i>RZ Series Reference Manual</i> | EK-RZXXD-RM |
| DECconnect System | |
| <i>DECconnect System General Description</i> | EK-DECSY-GD |
| <i>DECconnect System Requirements Evaluation Workbook</i> | EK-DECSY-EG |
| <i>DECconnect System Installation and Verification Guide</i> | EK-DECSY-VG |
| <i>DECconnect System Stand-alone ThinWire Networks: Planning and Installation Guide</i> | EK-DECSY-TG |
| <i>DECconnect System Planning and Configuration Guide</i> | EK-DECSY-CG |
| SCSI | |
| <i>Small Computer System Interface: An Overview</i> | EK-SCSIS-OV |
| <i>Small Computer System Interface: A Developers Guide</i> | EK-SCSIS-SP |

Table A-3 OSF/1 Printed Documents

| Titles |
|--|
| Startup Kit |
| <i>Guide to Installing DEC OSF/1</i> |
| <i>Guide to System and Network Setup and Configuration</i> |
| <i>DEC OSF/1 Realtime Installation Guide</i> |

(continued on next page)

Associated Documents

Table A-3 (Cont.) OSF/1 Printed Documents

Titles

Migration Kit

ULTRIX to DEC OSF/1 Migration Guide

General User Kit

Reader's Guide

OSF/1 User's Guide

OSF/Motif User's Guide

Network and Communications Overview

System and Network Management Kit

Guide to System Administration

*Guide to Network and Communications Management and
Problem Solving*

(continued on next page)

Table A-3 (Cont.) OSF/1 Printed Documents

Titles

General Programming Kit

*DEC OSF/1 Programmer's Guide**Guide to Programming Support Tools**OSF/1 Network Applications Programmer's Guide**UNIX System V Release 3.2 STREAMS Primer**UNIX System V Release 3.2 STREAMS Programmer's Guide**Guide to Programming with ONC RPC**Guide to DECthreads**Guide to Internationalization**System V Compatibility User's Guide**Guide to Realtime Programming**Application Environment Specification (AES) Operating System Programming Interfaces Volume**Application Environment Specification (AES) User Environment Volume**POSIX Conformance Document*

(continued on next page)

Table A-3 (Cont.) OSF/1 Printed Documents

Titles

Windows Programming Kit

OSF/Motif Programmer's Guide

OSF/Motif Style Guide

DECwindows Companion to the OSF/Motif Style Guide

DECwindows Motif Guide to Application Programming

DECwindows Extensions to Motif, UNIX Systems Edition

X Window System

X Window System Toolkit

Guide to Developing Applications for the Display PostScript System

Display PostScript System Programmer's Reference Tools

Miscellaneous Documentation

Bookreader User's Guide

Linkworks User's Guide

GNU Emacs Manual

GNU Emacs Lisp Reference Manual

Guide to Prestoserve

Table A-4 OpenVMS Documentation

Titles

General

OpenVMS Alpha AXP Layered Products Disc User's Guide

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Table A-4 (Cont.) OpenVMS Documentation**Titles****Programming Tools and Languages Documentation**

DEC FORTRAN Language Reference Manual
DEC FORTRAN User Manual for Alpha AXP VMS Systems
DEC C Language Reference Manual
DEC C User's Guide for VMS Systems
VMS Run-Time Library for DEC C Reference Manual
DEC C Reference Supplement for Alpha AXP VMS Systems
Guide to Debugger for VMS Systems
VMS Debugger Manual Supplement for Alpha AXP VMS
DECset Installation Guide for VMS Systems
Guide to Source Code Analyzer for VMS Systems
Guide to Test Manager for VMS Systems
Guide to Code Management Systems for VMS Systems
Guide to Module Management Systems for VMS Systems
Migrating to an Alpha AXP VMS System: Translating Images
VEST Base Level 3.3 Release Notes
Alpha AXP MACRO-64 Reference Manual
Digital Extended Math Library Reference Manual, Vol 1
Digital Extended Math Library OpenVMS Alpha AXP User Guide
Digital Extended Math Library Installation Guide OpenVMS
FMS Introduction
FMS Mini-Reference
FMS Installation Guide

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Table A-4 (Cont.) OpenVMS Documentation

Titles

Programming Tools and Languages Documentation

FMS Language Interface Manual

FMS Form Driver Reference Manual

FMS Utilities Reference Manual

DECwindows Documentation

Alpha AXP VMS DECwindows Motif Cover Letter

VMS DECwindows Motif Quick Reference

VMS DECwindows Motif User's Guide

VMS DECwindows Motif Applications Guide

Alpha AXP VMS DECwindows Motif Installation Guide

*VMS DECwindows Motif Guide to Application
Programming*

DECwindows Extensions to Motif

VMS DECwindows Guide to Non-C Bindings

*VMS DECwindows Guide to Xlib (Release 4) Programming:
MIT C Binding*

*VMS DECwindows Guide to Xlib (Release 4) Programming:
VAX Binding*

*Overview to VMS DECwindows Motif Programming
Documentation*

DECwindows Companion to the OSF/Motif Style Guide

Porting XUI Applications to Motif

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