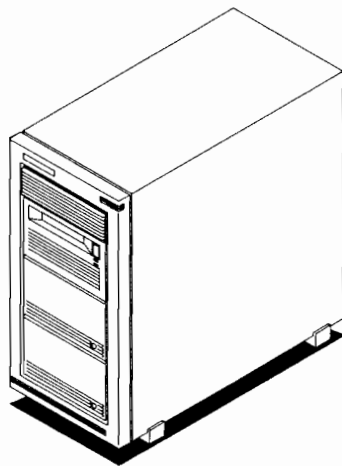


HP Series 6000 Mass Storage System Hardware Installation Manual



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July 1991
September 1992

Typographical Conventions

The following conventions are used throughout this manual:

- *Italic* is used for emphasis or manual titles.

Note Notes contain important information.



Caution Caution messages indicate procedures which, if not observed, could result in damage to equipment.



Warning Warning messages indicate procedures or practices which, if not observed, could result in personal injury.



About This Manual

This manual contains instructions for connecting your mass storage system to your host computer and installing mass storage devices into your mass storage system.

Note



This manual is written for those who are experienced with installing computers and peripherals. If you are not experienced with installing computers and peripherals, you should find an experienced person to help you or contact your local Hewlett-Packard Sales and Support Office.



Contents

1. Installing Your Mass Storage System

Before You Begin	1-1
Protecting Against ESD	1-1
Handling Precautions	1-2
Selecting a Location	1-2
Unpacking Your Mass Storage System	1-3
Installing Your Mass Storage System	1-4
Connecting the Power Cord	1-4
Performing a Power-On Test	1-6
Checking SCSI Addresses	1-7
Connecting SCSI Cabling	1-8
Configuring Your Host Computer	1-14
Recording Configuration Information	1-15

2. Installing Mass Storage Devices

Disconnecting Your Mass Storage System	2-2
Disassembling Your Mass Storage System	2-2
Removing the Cover	2-3
Removing the Side Panels	2-4
Removing the Shield Panels	2-5
Installing Mass Storage Devices	2-6
Installing a Device into a Shelf	2-7
Connecting Internal Cables	2-9
Setting SCSI Address Switches	2-11
Attaching Device Serial Numbers	2-17
Reassembling Your Mass Storage System	2-18
Reinstalling the Side Panels	2-19
Removing Filler Panels	2-20
Reinstalling the Cover	2-21
Removing a Mass Storage Device	2-22

Index

Figures

1-1. Shipping Package Contents	1-3
1-2. Controls, Indicators, and Connectors	1-5
1-3. Connecting One SCSI Cable	1-11
1-4. Connecting Two SCSI Cables	1-12
1-5. Installing a SCSI Terminator	1-13
1-6. Pull-out Configuration Card	1-15
2-1. Removing the Cover	2-3
2-2. Removing the Side Panels	2-4
2-3. Removing a Shield Panel	2-5
2-4. Installing a Device	2-7
2-5. Securing a Device	2-8
2-6. Internal Power and SCSI Cables	2-9
2-7. Internal Address Cable	2-10
2-8. Shelf Numbers and Default SCSI Addresses	2-12
2-9. Correlating Address Connectors and Switches	2-13
2-10. 3-Segment SCSI Address Switch Settings	2-15
2-11. 4-Segment SCSI Address Switch Settings	2-16
2-12. Installing Side Panels	2-19
2-13. Removing a Filler Panel	2-20
2-14. Installing the Cover	2-21
2-15. Locating the Power Connector Tool	2-23
2-16. Removing the Power Connector	2-24

Tables

1-1. SCSI Cables and Accessories	1-9
--	-----

Installing Your Mass Storage System

This chapter contains instructions for installing your mass storage system on your host computer.

Before You Begin

Read this section before you begin installing your mass storage system.

Protecting Against ESD

Caution



A static charge of over 30,000 volts can be generated by walking across a carpeted floor. If you do not protect your mass storage system against electrostatic discharge (ESD), it may be damaged and you may void your warranty. Call your Hewlett-Packard sales representative for information on ordering static control accessories.

Handling Precautions

Caution

Observe the following precautions when handling or transporting your mass storage system. Failure to observe these precautions could result in loss of data or damage to your mass storage system:

- Handle the mass storage system carefully. Avoid dropping or bumping it.
 - When transporting the mass storage system, always package it in the original packaging material or a similar substitute.
 - Do not lay the mass storage system on its side or stack it on top of another mass storage system.
-

Selecting a Location

Detailed information regarding site requirements for your mass storage system is included in the *Mass Storage System User's Manual*. Generally, the location should provide:

- A temperature between 10° C and 40° C (50° F and 104° F).
- Relative humidity between 20% and 80%.
- A stable environment, free from any sudden changes in temperature and humidity.
- Low levels of shock and vibration.
- A constant line voltage.
- At least 2 inches (50 mm) of space in front of and behind the mass storage system.

Unpacking Your Mass Storage System

The instructions for unpacking your mass storage system are printed on the shipping carton. Keep all of the packing material in case you need to repackage your mass storage system. Remove the mass storage system from the container and inspect it for any damage that may have occurred during shipment. Also, make sure you have the items shown in Figure 1-1. If anything is missing or damaged, notify your Hewlett-Packard Sales and Support Office immediately.

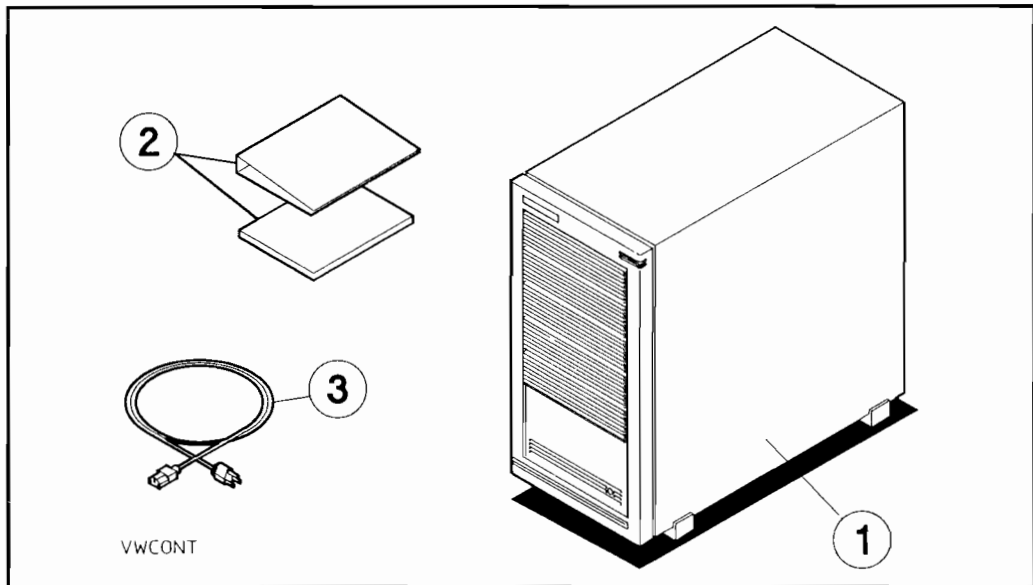


Figure 1-1. Shipping Package Contents

- 1—Mass Storage System
- 2—Documentation and Binder

- 3—Power Cord

Installing Your Mass Storage System

The following steps describe how to install your mass storage system on your host computer. Figure 1-2 shows the mass storage system controls, indicators, and connectors.

Connecting the Power Cord

Warning



- To avoid a fire hazard, the ac branch service must be properly current-protected by either a fuse or a circuit breaker.
- Use only a UL/CSA approved power cord, SVT type, rated for suitable voltage and current. These power cords have two conductors plus a ground. Failure to use the proper power cord could result in a shock or fire hazard.

Note



Your mass storage system contains an automatic ranging power supply which adjusts itself to the input line voltage.

To connect the power cord (see Figure 1-2):

1. Set the LINE switch to the 0 (OFF) position.
2. Connect the female end of the power cord to the power cord connector on the rear of the mass storage system.
3. Connect the male end of the power cord into an ac power outlet.

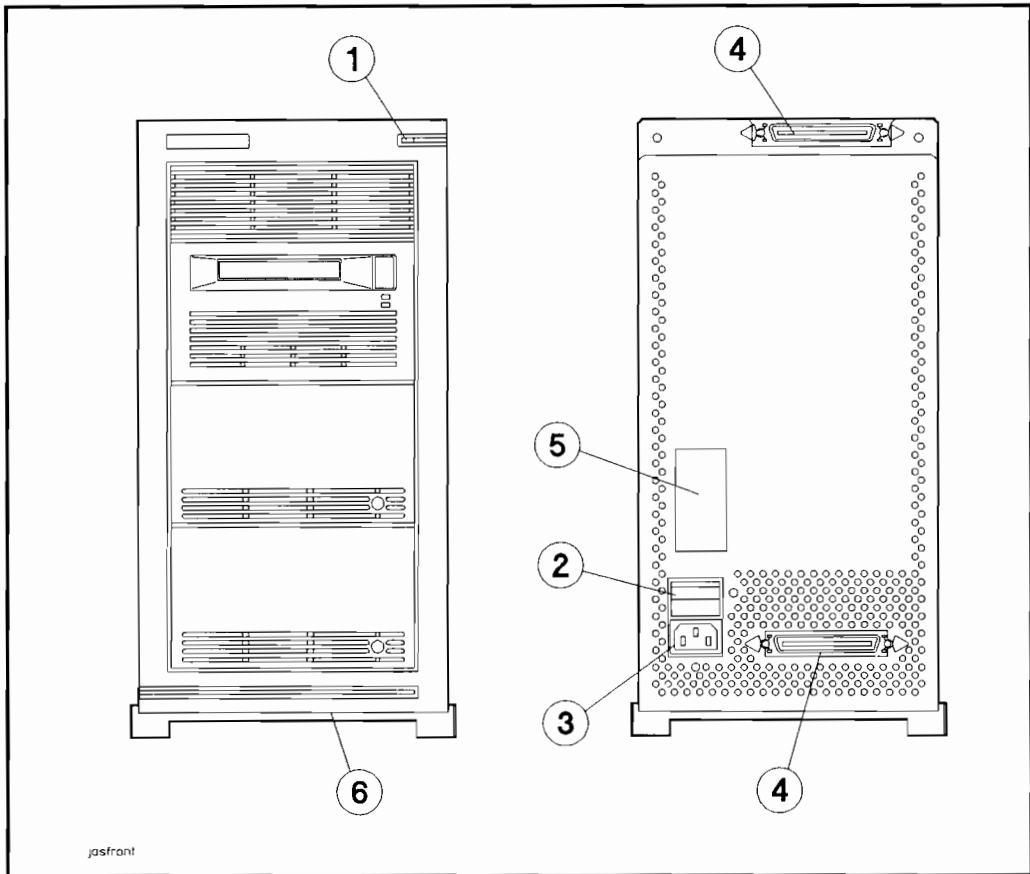


Figure 1-2. Controls, Indicators, and Connectors

1—Power-On Light

2—LINE Switch

3—Power Cord Connector

4—SCSI Connectors

5—Serial Number

6—Pull-out Configuration Card

Performing a Power-On Test

Before connecting the mass storage system to the host computer, you should perform a power-on test to make sure all mass storage devices are working properly.

To perform a power-on test (see Figure 1-2):

1. Set the power switch to the 1 (ON) position.
2. Check the power-on light; it should be on.
3. Wait about 40 seconds for all of the mass storage devices to complete self-test. During this time, the device status lights will flash in various patterns. When the self-tests complete successfully, the status light on each device except the DDS-format DAT drive should be off. (Refer to the *DDS-Format DAT Drive User Manual* for information about status light indications for the DDS-format DAT drive.)

Note



If a mass storage device fails self-test, contact your Hewlett-Packard service representative.

4. Set the power switch to the 0 (OFF) position.

Checking SCSI Addresses

Note

For optimum system performance, the SCSI address of the system disk should always be set to the highest SCSI address available (usually address 6).

- Each operating system has specific requirements regarding the number of devices that can be connected to the SCSI interface, and the SCSI address assigned to each device. To check system requirements, refer to your *System Administration Manual* or *Owner's Guide*.
- Make sure the SCSI addresses assigned to the devices do not conflict with addresses used by any other devices connected to the host SCSI interface. Refer to "Setting SCSI Address Switches" in Chapter 2 if you need to change any SCSI addresses, and for information about the factory default SCSI addresses assigned to devices within your mass storage system.

Connecting SCSI Cabling

Caution

- Do not connect a host with a differential SCSI interface to a mass storage system with a single-ended SCSI interface. Damage to the host and the mass storage system may result.
 - Use only cables listed in Table 1-1 to connect the mass storage system to the SCSI bus. Failure to use these shielded cables may cause noncompliance with Radio Frequency Interference (RFI) specifications.
-

Note

Your mass storage system contains one of the following SCSI interfaces: single-ended, narrow differential, or fast and wide differential. Refer to the *Mass Storage System Quick Reference Card* to determine the SCSI interface your mass storage system contains.

Table 1-1. SCSI Cables and Accessories

Part Number	Description	Use
HP K2296 HP K2297	1-meter SCSI interface cable 1.5-meter SCSI interface cable (high-density thumbscrew to low-density bail-lock)	Connects the mass storage system to the host computer
HP 92222A HP 92222B HP 92222C	0.5-meter SCSI interface cable 1-meter SCSI interface cable 2-meter SCSI interface cable (low-density male bail-lock at each end)	Connects two mass storage systems together
HP 92222D	1-meter SCSI extender cable (low-density female bail-lock to low-density male bail-lock)	Extends a SCSI interface cable 1 meter.
HP C2911A	0.9-meter SCSI interface cable (high-density thumbscrew to high-density thumbscrew)	Connects the mass storage system to the host computer
K2291	SCSI single-ended terminator (low-density bail-lock)	Terminates the SCSI interface
C2905A	SCSI fast and wide differential terminator (high-density bail-lock)	Terminates the SCSI interface

One or more mass storage systems can be connected to the host computer. You must ensure that the SCSI cabling conforms to the following standards:

- The SCSI bus allows a maximum of eight devices, including the host computer system.
- The last mass storage system on the bus must have a SCSI terminator connected to the unused SCSI connector.
- Multiple mass storage systems can be connected together. However, the *total* number of devices within the cabinets must not exceed seven.
- Each mass storage system contains 1.3 meters (4.3 feet) of internal SCSI cabling. To ensure optimum performance, the total length of internal SCSI cabling plus external SCSI cabling must not exceed the following limits:
 - 6 meters (19.7 feet) for single-ended systems
 - 25 meters (82 feet) for narrow differential systems
 - 25 meters (82 feet) for fast and wide differential systems
- The last mass storage system on the bus must have a SCSI terminator connected to the unused SCSI connector.

To connect SCSI cabling to your mass storage system and the host computer:

1. Switch off host computer power and mass storage system power.
2. Connect the small SCSI cable connector to the host then connect the large SCSI cable connector to the lower SCSI connector on the rear of the mass storage system (see Figure 1-3). Push the SCSI connector retaining clips into place.

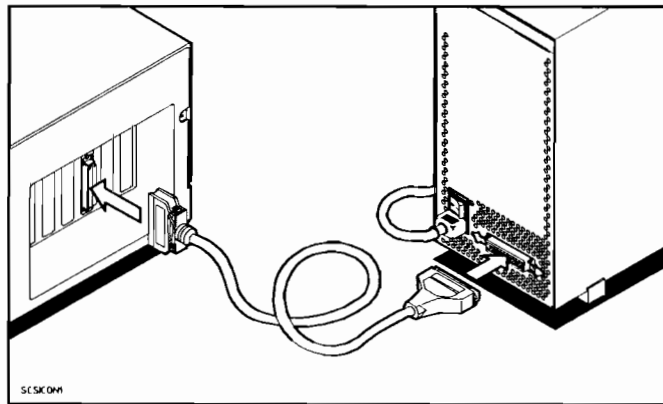


Figure 1-3. Connecting One SCSI Cable

3. If you are connecting additional mass storage systems, connect them with a SCSI interface cables that have large connectors at each end (see Figure 1-4).

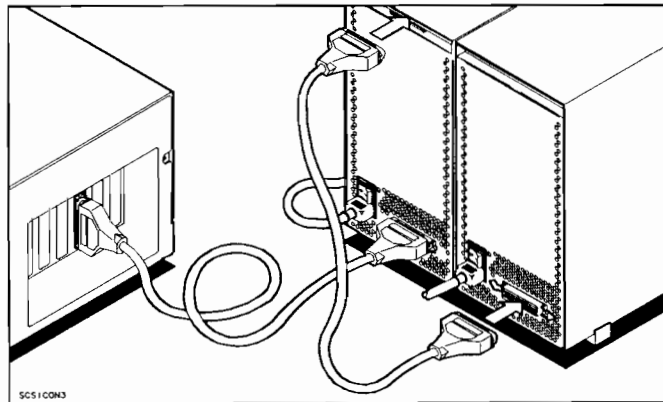


Figure 1-4. Connecting Two SCSI Cables

4. Install a SCSI terminator on the unused SCSI connector. Push the retaining clips over the SCSI terminator (see Figure 1-5).

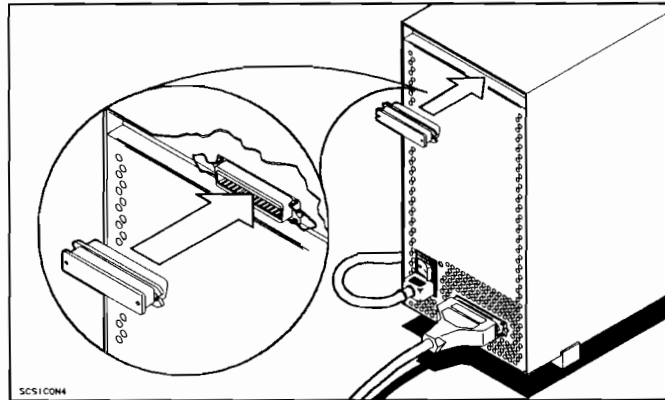


Figure 1-5. Installing a SCSI Terminator

5. Switch on mass storage system power.
6. Switch on host computer power.

Note



Individual devices in the mass storage system do not supply termination power to the SCSI bus. This may cause misleading self-test results for hard disk drives when your host computer is connected but not powered on. If self-test appears to fail, an accurate self-test can be verified by one of two methods:

1. Disconnect all external SCSI cables and terminators from the mass storage system, then switch on power, or
 2. With cables and terminators connected, switch on the host system power before switching on power to the mass storage system.
-

Configuring Your Host Computer

Note



Refer to your *System Administration Manual* or *Owner's Guide* for information about configuring your host computer for your mass storage system.

Recording Configuration Information

The pull-out configuration card provides space to record configuration information about mass storage devices and the host SCSI interface card (see Figure 1-6). This information is useful when configuring your mass storage system into the host operating system.

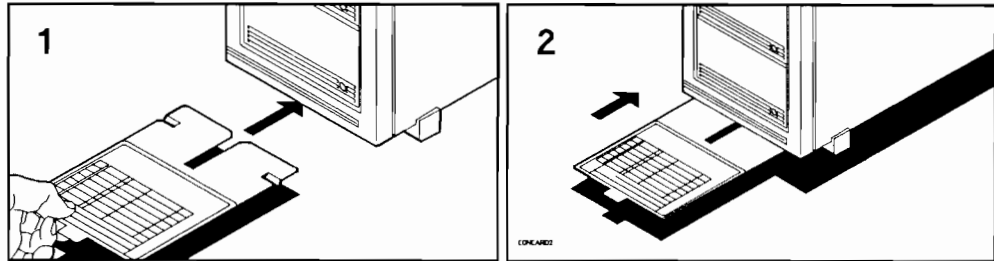


Figure 1-6. Pull-out Configuration Card



Installing Mass Storage Devices

Caution



Your mass storage system is designed for optimum performance when using *only* Hewlett-Packard mass storage devices. The installation of other mass storage devices may invalidate the performance, regulatory, and safety specifications of your mass storage system, and may cause damage to your mass storage system which may not be covered by your warranty.

This chapter contains procedures for installing additional mass storage devices into your mass storage system. These devices can be ordered as upgrade kits (refer to the *Mass Storage System Quick Reference Card*).

Note



Refer to the device *Installation Details*, included with each device upgrade kit, to connect the following internal cables to the device: power cable, SCSI cable, and address cable.

Disconnecting Your Mass Storage System

Disconnect the mass storage system from the host computer as follows:

1. Shut down (halt) the host computer.
2. Switch off host computer power.
3. Switch off mass storage power.
4. Disconnect the power cord from the mass storage system.
5. Disconnect the SCSI cable from the mass storage system.

Disassembling Your Mass Storage System

Warning

To avoid electrical shock:



- Make sure the mass storage system LINE~ switch is in the 0 (OFF) position and the power cord is disconnected before disassembling the mass storage system.
 - Only disassemble as much of the mass storage system as is described in the following steps.
-

Removing the Cover

To remove the cover (see Figure 2-1):

1. Loosen the cover captive mounting screws.
2. Slide the cover forward and lift the cover off of the chassis.

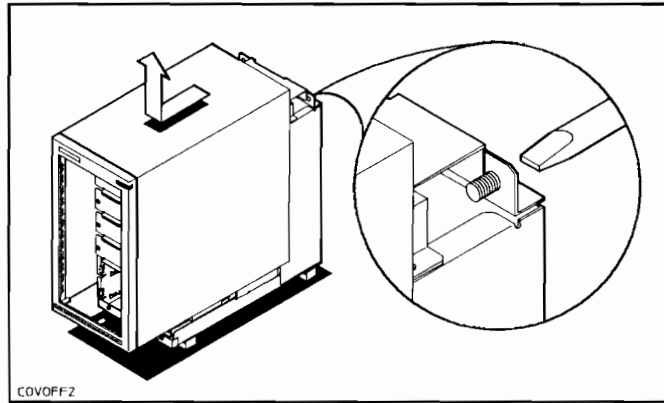


Figure 2-1. Removing the Cover



Removing the Side Panels

To remove a side panels (see Figure 2-2):

1. Loosen the captive mounting screw on each side panel.
2. Lift the side panels up and away from the chassis.

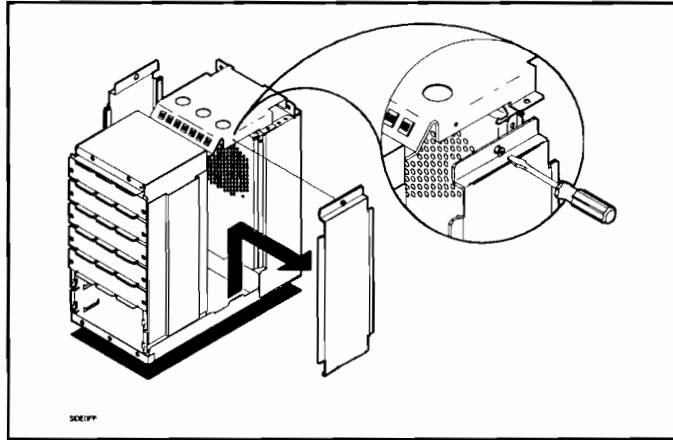


Figure 2-2. Removing the Side Panels

Removing the Shield Panels

To remove the shield panels (see Figure 2-3):

1. Check the device *Installation Details* to determine how many shield panels must be removed for the device being installed.
2. Loosen the two captive screws holding each panel and pull the panels away from the chassis.

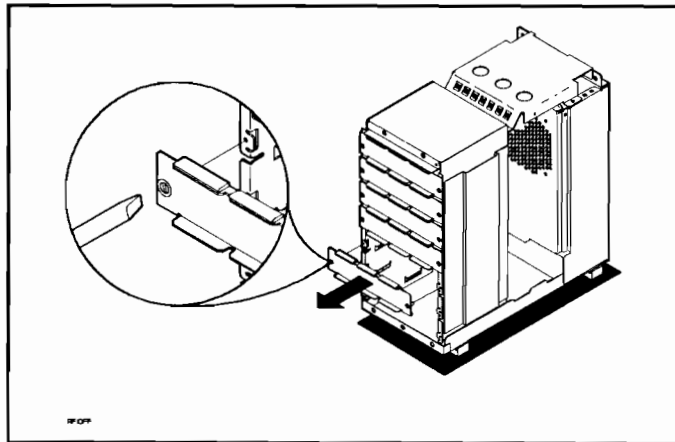


Figure 2-3. Removing a Shield Panel

Installing Mass Storage Devices

Caution

- Handle mass storage devices carefully. Mass storage devices are susceptible to mechanical shock and vibration until they are secured into the mass storage system.
 - When handling mass storage devices, keep them upright. Some devices are more susceptible to mechanical shock when they are upside down.
 - Protect mass storage devices from static electricity. Follow the instructions in the *Static Caution* pamphlet before installing mass storage devices.
-

Note

- Refer to the *Mass Storage System Quick Reference Card* to determine the shelves each device may be installed on.
 - To avoid making the mass storage system cabinet unstable, install hard disk drives on the lower shelves.
 - For convenient access, install devices that use removable media on the upper shelves.
-

Installing a Device into a Shelf

To install a device into a shelf:

1. Remove the device from the anti-static bag.
2. Slide the device into a shelf on the front of the mass storage system.

Caution

Be careful not to snag the device address cable on the chassis. Damage to the cable wiring may occur.

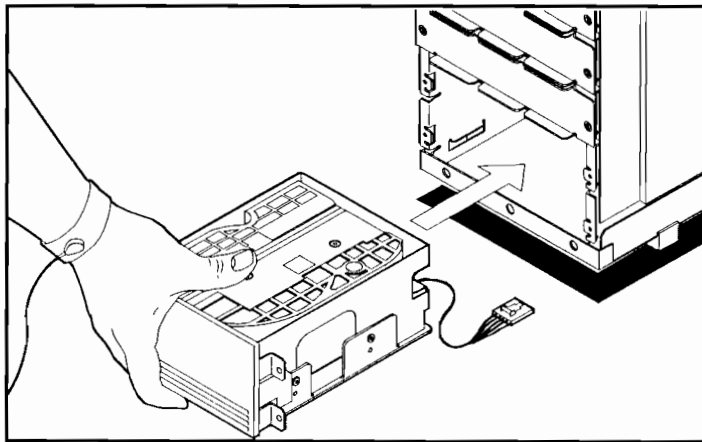


Figure 2-4. Installing a Device

3. Align the mounting screws with the holes in the chassis, and tighten the screws securely (see Figure 2-5). 2-shelf devices have four mounting screws and 1-shelf devices have two mounting screws.

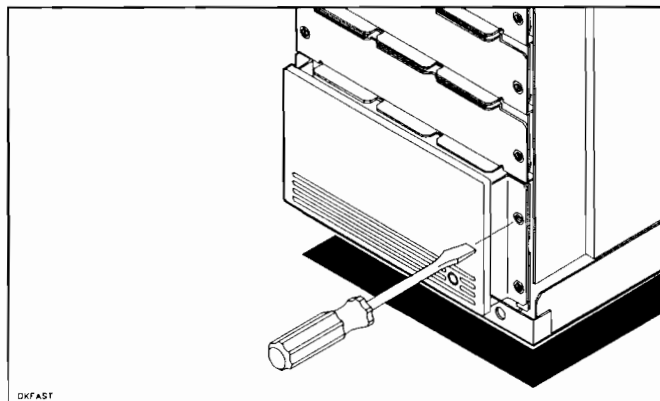


Figure 2-5. Securing a Device

Connecting Internal Cables

To connect mass storage system internal cables:

1. The internal power cable and the internal SCSI cable each have seven connectors — one for each shelf (see Figure 2-6). For 1-shelf devices, connect the power cable and the SCSI cable corresponding to the shelf position occupied by the device. For 2-shelf devices, connect the power cable and the SCSI cable corresponding to the *lowest* shelf position occupied by the device.

Note



Your mass storage system contains one of the following types of internal SCSI cables: a 50-pin single-ended cable, a 50-pin narrow differential cable, or a 68-pin fast and wide differential cable.

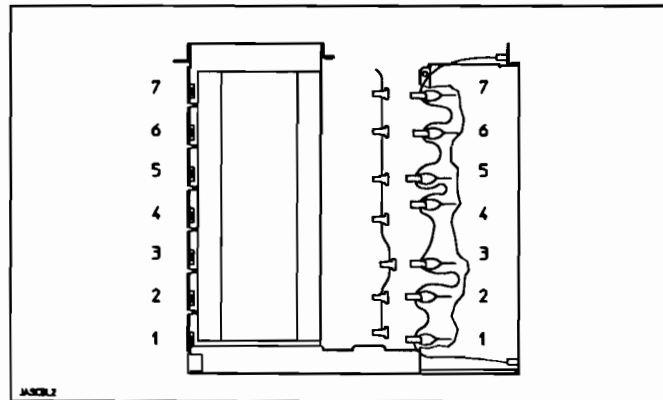


Figure 2-6. Internal Power and SCSI Cables

2. The internal address cable has connectors — one for each shelf (see Figure 2-7). The shelf number is printed on each internal address cable connector. For 1-shelf devices, connect the address cable corresponding to the shelf position occupied by the device. For 2-shelf devices, connect the address cable corresponding to the *lowest* shelf position occupied by the device.

Note

The internal address cable in your mass storage system is either a wire-type cable (shown in Figure 2-7) or a flexible circuit-type cable. Both cables use the same type connectors.

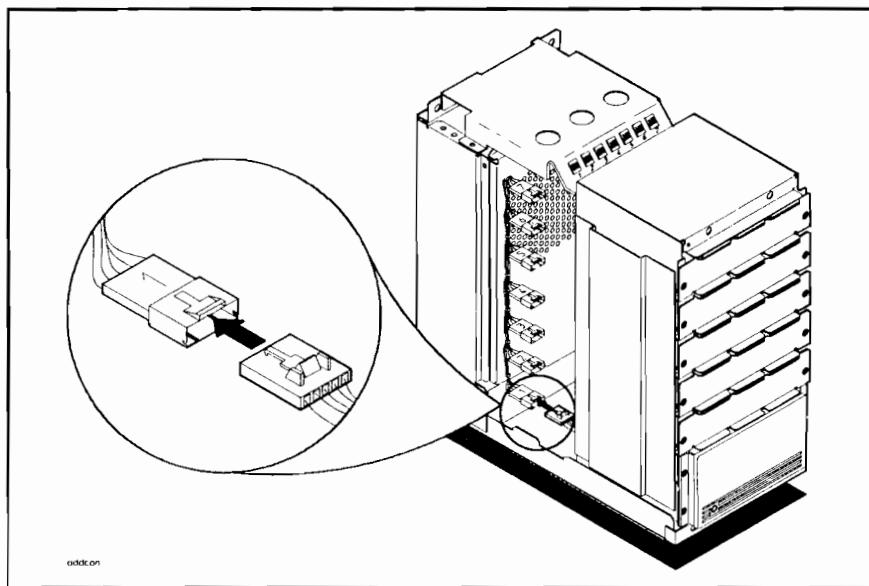


Figure 2-7. Internal Address Cable

Setting SCSI Address Switches

Note

For optimum system performance, the SCSI address of the system disk should always be set to the highest SCSI address available (usually address number 6).

Each device installed in your mass storage system requires a unique SCSI address (0-6 or 0-15). The address of the host SCSI interface card is normally set to 7 for SCSI single-ended mass storage systems. The SCSI address switches are marked underneath with mass storage system shelf numbers (1-7), and are used to set a SCSI address for each device in your mass storage system (see Figure 2-9).

During assembly at the factory, each mass storage device is set to a default SCSI address. The default SCSI addresses should work on most system configurations. However, if other devices are connected to the SCSI interface, including internal devices, make sure the default SCSI addresses do not conflict with the addresses used by other devices.

Use the following rules to determine default SCSI addresses (see Figure 2-8):

- A single-shelf device uses the address corresponding to the shelf number it occupies.
- A multi-shelf device uses the address corresponding to the *lowest* shelf number it occupies.

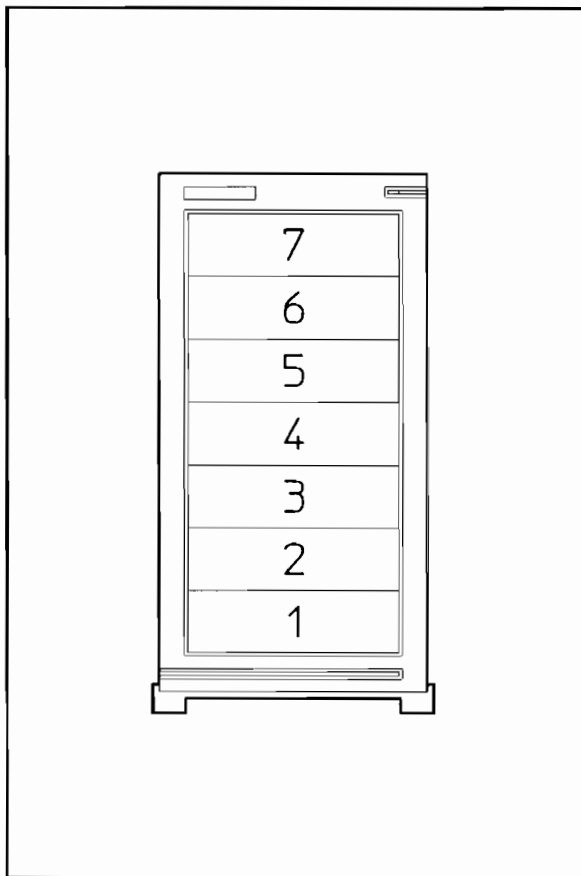


Figure 2-8. Shelf Numbers and Default SCSI Addresses

To set the device SCSI address:

1. Identify the address cable connector the device is connected to. Each address cable connector has a number on it that corresponds to an address switch with the same number (see Figure 2-9).

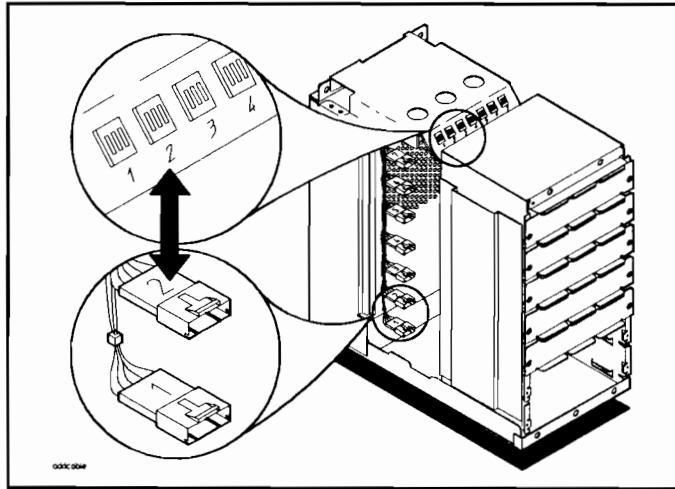


Figure 2-9. Correlating Address Connectors and Switches

2. Select a SCSI address not being used by other devices within the mass storage system.
3. Set the address switch to the address you selected (see Figure 2-10 or Figure 2-11).

Note

The address switches for mass storage systems with single-ended or narrow differential SCSI interfaces have three segments (see Figure 2-10). The address switches for mass storage systems with fast and wide differential SCSI interfaces have four segments (see Figure 2-11).

4. Write the device SCSI address on the pull-out configuration card (see Figure 1-6). Use a space on the card that corresponds to a shelf occupied by the device.

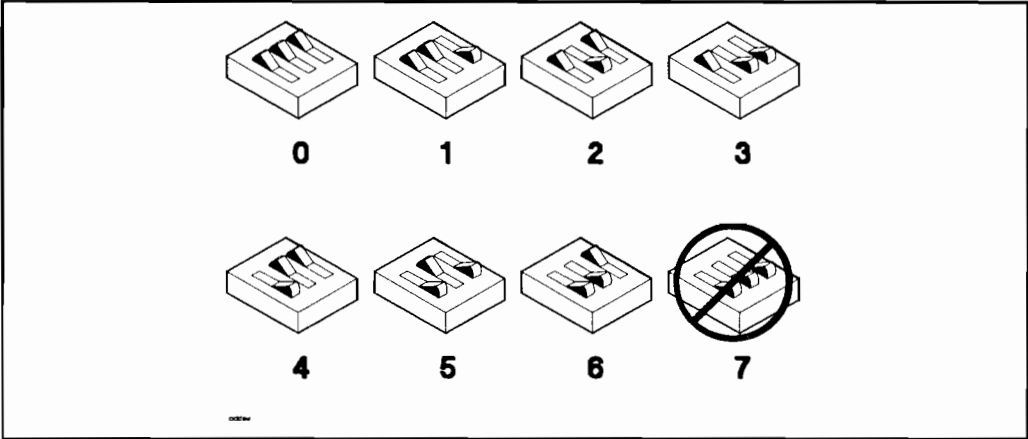


Figure 2-10. 3-Segment SCSI Address Switch Settings

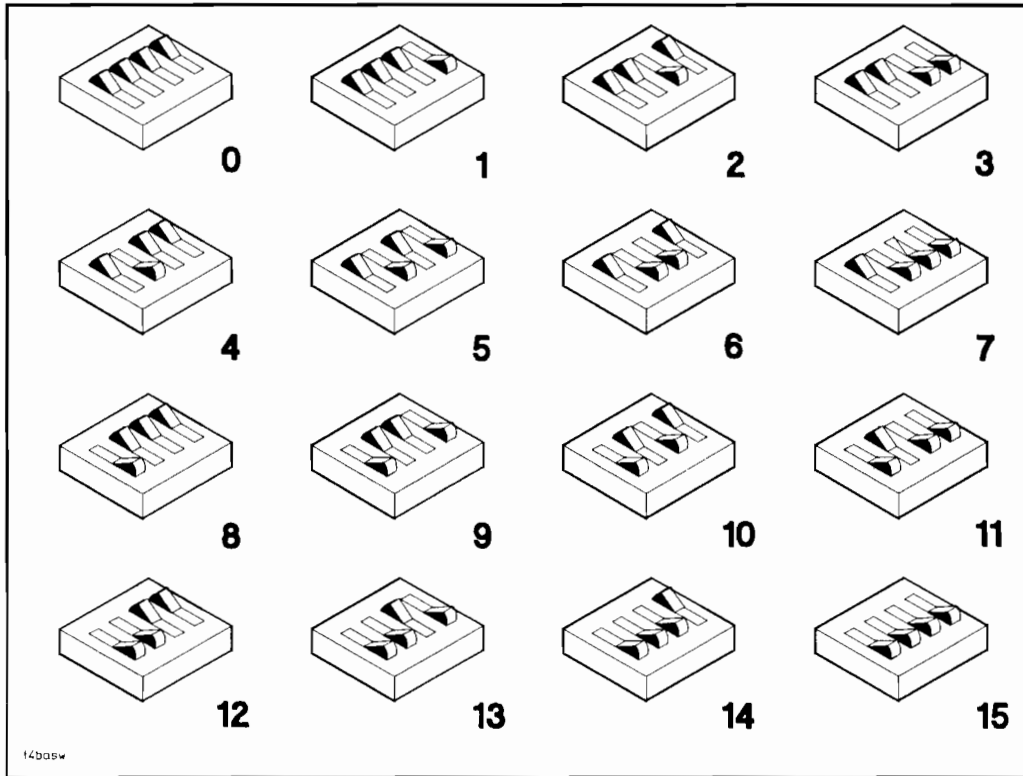


Figure 2-11. 4-Segment SCSI Address Switch Settings

Attaching Device Serial Numbers

A serial number label is included with each device. Attach the label to the rear of the mass storage system to identify the devices within your mass storage system.

Caution



Do not place the label over the airflow vent holes on the rear panel. The internal temperature of the mass storage system will exceed the recommended environmental limits and damage to your mass storage system may occur.

Reassembling Your Mass Storage System

Warning



After a mass storage device is installed in the mass storage system, the mass storage system must be carefully reassembled to ensure compliance with RFI emission requirements, and to provide protection against electrical shock and fire hazards.

Note



When you have finished reassembling your mass storage system, perform the steps in Chapter 1 to return your mass storage system to operation with the host computer.

Reinstalling the Side Panels

To reinstall the side panels (see Figure 2-12):

1. Install the side panels into the sides of the chassis.
2. Tighten the captive mounting screws.

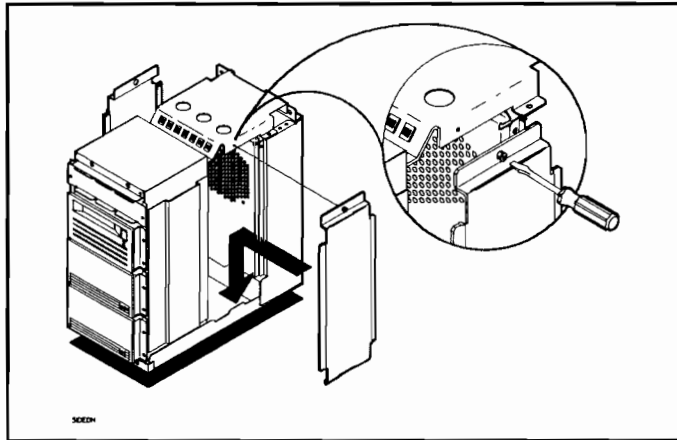


Figure 2-12. Installing Side Panels

Removing Filler Panels

A filler panel must be removed for each shelf position occupied by a mass storage device. To remove a filler panel (see Figure 2-13):

1. Press on the center of the filler panel.
2. Grasp the filler panel and pull it away from the chassis.

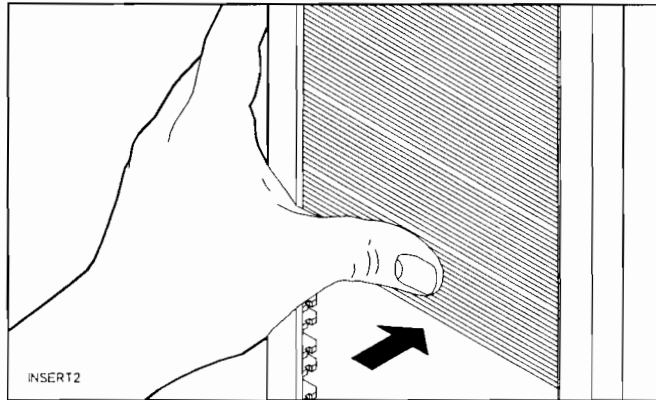


Figure 2-13. Removing a Filler Panel

Reinstalling the Cover

To reinstall the cover (see Figure 2-14):

1. Place the cover on the mass storage system chassis.
2. Slide the cover toward the rear of the mass storage system.
3. Tighten the two cover mounting screws securely.

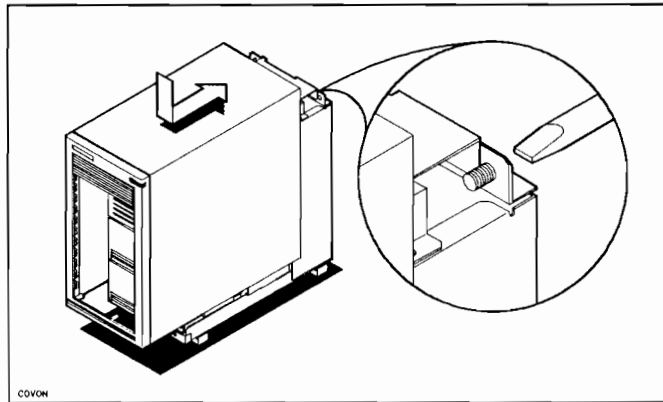


Figure 2-14. Installing the Cover

Removing a Mass Storage Device

You may need to remove a mass storage device to change its location within the mass storage system, or for service.

Warning

To avoid electrical shock:



- Make sure the mass storage system **LINE** switch is in the **0 (OFF)** position and the power cord is disconnected before disassembling the mass storage system.
- Only disassemble as much of the mass storage system as is described in the following steps.

Caution



If the device contains removable media, remove the media before switching off mass storage system power. The device may be damaged if media remains in the device while the device is being removed.

To remove a mass storage device:

1. Take precautions against static electricity.
2. Disassemble the mass storage system.
3. Disconnect the SCSI cable from the device.
4. Disconnect the device address cable from the internal address connector.
5. Disconnect the power cable from the device as follows:

Caution

If the power connector tool is not used to disconnect the power supply cable, power cable wiring may be damaged.

- a. Locate the power connector tool (see Figure 2-15).

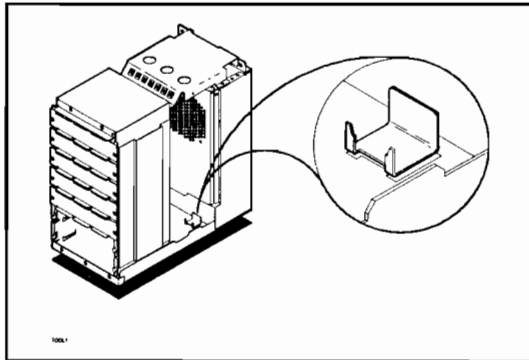


Figure 2-15. Locating the Power Connector Tool

- b. Slide the power connector tool over the connector (see Figure 2-16).
- c. Pull on the power connector tool and remove the power connector.

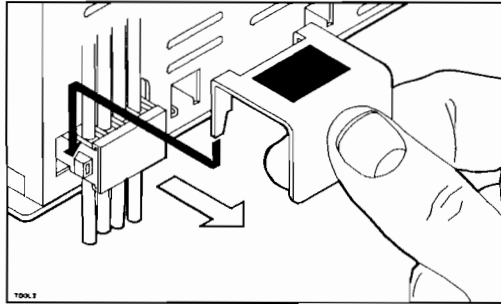


Figure 2-16. Removing the Power Connector

6. Loosen the captive mounting screws.
7. Slowly push the rear of the device out of the front of the mass storage system.

Index

A

- address cable
 - connecting, 2-9
- address switches
 - setting, 2-11

C

- cables
 - connecting, 2-9
 - card
 - configuration card, 1-15
 - configuration
 - host computer, 1-14
 - configuration card, 1-15
 - configuration information
 - recording, 1-15
 - connecting
 - external SCSI cabling, 1-8
 - internal cables, 2-9
 - power cord, 1-4
 - connectors
 - power cord, 1-5
 - SCSI, 1-5
 - cover
 - installation, 2-21
 - removal, 2-3
- ## D
- devices
 - installation, 2-6
 - removal, 2-22
 - serial numbers, 2-17

E

- electro-static discharge control, 1-1

F

- filler panels
 - removal, 2-20

H

- handling
 - mass storage system, 1-2
- host computer
 - configuration, 1-14

I

- indicator
 - power-on, 1-5
- installation
 - cover, 2-21
 - devices, 2-6
 - mass storage system, 1-1, 1-4
 - side panels, 2-19
- internal cables
 - connecting, 2-9

L

- light
 - power-on , 1-5
- LINE switch, 1-5
- location
 - selecting, 1-2

M

mass storage devices. *See* devices
mass storage system
 disassembly, 2-2
 disconnecting from host, 2-2
 handling, 1-2
 installation, 1-1, 1-4
 internal cables, 2-9
 location, 1-2
 parts, 1-5
 reassembling, 2-18
 unpacking, 1-3

O

operator controls, 1-5

P

power cable
 connecting, 2-9
power cable removal tool, 2-23
power cord
 connecting, 1-4
power cord connector, 1-5
power-on light, 1-5
power-on test, 1-6

R

removal
 cover, 2-3

devices, 2-22
filler panels, 2-20
power cable tool, 2-23
shield panels, 2-5
side panels, 2-4

S

SCSI address
 setting, 2-11
SCSI addresses
 checking, 1-7
SCSI cable
 connecting, 2-9
SCSI cabling
 connecting, 1-8
 length, 1-10
SCSI connector, 1-5
serial number, 1-5
serial numbers
 attaching, 2-17
 devices, 2-17
shield panels
 removal, 2-5
side panels
 installation, 2-19
 removal, 2-4
static electricity control, 1-1
switch
 LINE[™], 1-5