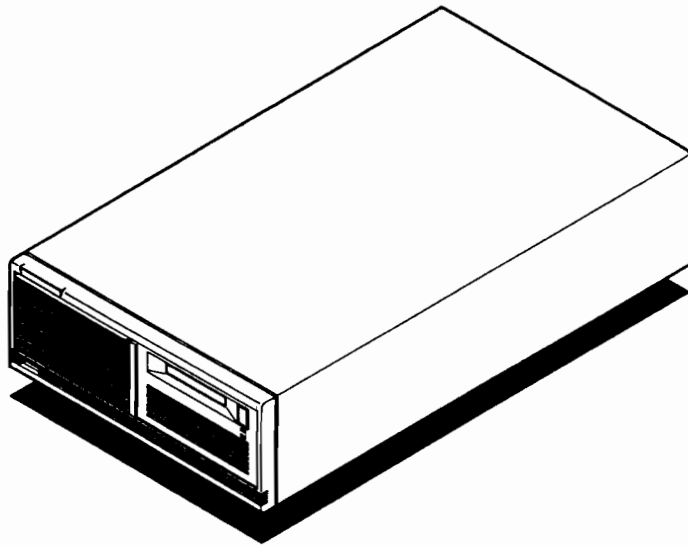




HP Series 6000 Mass Storage System Hardware Installation Manual



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Edition 1

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.



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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.
-

Selecting a Location

Detailed information regarding site requirements for your mass storage system is included in the *HP Series 6000 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 3 inches (76.2 mm) of space in front of and behind the mass storage system.

Unpacking Your Mass Storage System

Your mass storage system is shipped in a reusable shipping container (see Figure 1-1). 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. If anything is missing or damaged, notify your Hewlett-Packard Sales and Support Office immediately.



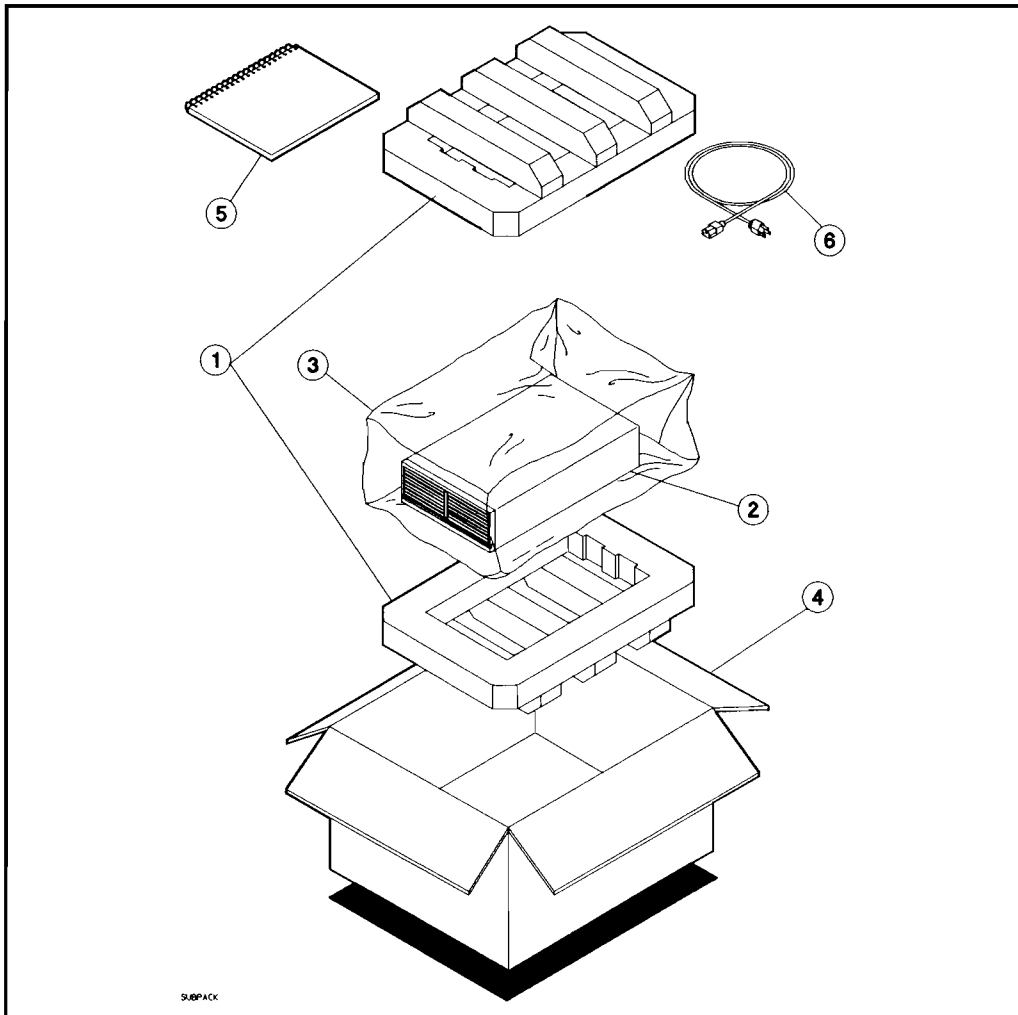


Figure 1-1. Shipping Package Contents

- 1—Foam Cushions
- 2—Mass Storage System
- 3—Antistatic Bag

- 4—Shipping Carton
- 5—Documentation
- 6—Power Cord

1-4 Installing Your Mass Storage System

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 (out) position.
2. Connect the female end of the power cord to the AC LINE connector on the rear of the mass storage system.
3. Connect the male end of the power cord to an ac power outlet.

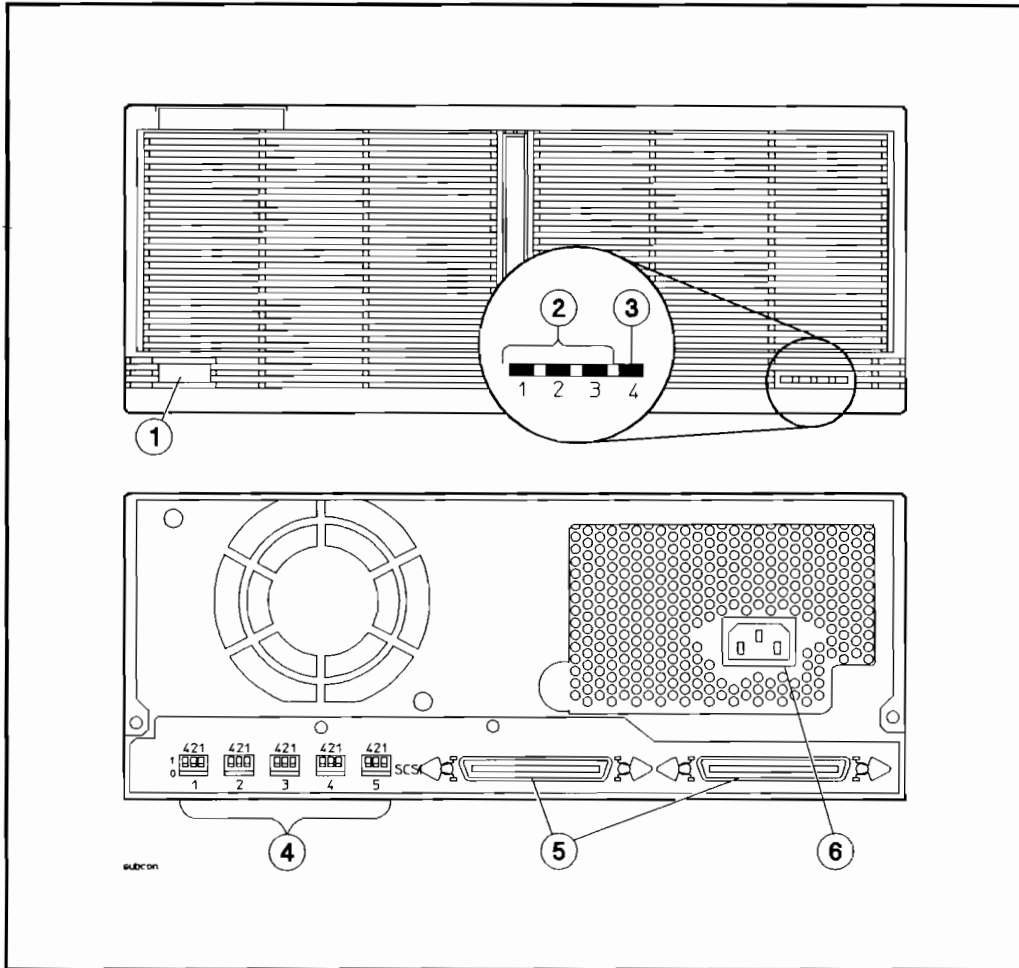


Figure 1-2. Controls, Indicators, and Connectors

- | | |
|---------------------------------|-------------------------|
| 1—LINE Switch | 4—SCSI Address Switches |
| 2—HDD Status Indicators (Amber) | 5—SCSI Connectors |
| 3—Power-On Indicator (Green) | 6—AC LINE Connector |

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 indicator; it should be green.
3. Wait about 40 seconds for 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 hard disk drive (HDD) status indicators and status lights on all other devices 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 computer with a differential SCSI interface to a mass storage system with a single-ended SCSI interface. Damage to the host computer and the mass storage system may result.
- Use only the 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.

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

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.
- Multiple mass storage systems can be connected together. However, the *total* number of devices within the mass storage systems must not exceed seven.
- Each mass storage system contains 1.75 meters (5.7 feet) of internal SCSI cabling. To ensure optimum performance, the total length of internal SCSI cabling plus external SCSI cabling must not exceed six meters (19.7 feet).
- 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 host computer SCSI cable to either of the two SCSI connectors on the rear panel of the mass storage system. Push the SCSI connector retaining clips into place.
3. Connect an additional mass storage system or connect the SCSI terminator to the other SCSI connector on the rear of the mass storage system.
4. Switch on mass storage system power.
5. 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 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

Table 1-2 can be used to record SCSI ID addresses for all mass storage devices on your system.

Table 1-2. SCSI Device Configuration Record

Mass Storage Devices	SCSI ID Numbers
<p>Internal Devices¹</p> <ul style="list-style-type: none"> • Host SCSI Interface Card (Normally SCSI ID = 7) • Hard Disk Drive 1 (Normally SCSI ID = 6) • Hard Disk Drive 2 (Normally SCSI ID = 5) • Hard Disk Drive 3 (Normally SCSI ID = 4) • DDS-format DAT Drive • CD-ROM Drive 	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>External Devices (HP Series 6000 Mass Storage Systems)²</p> <ul style="list-style-type: none"> • Hard Disk Drive 1 • Hard Disk Drive 2 • Hard Disk Drive 3 • Rewritable Optical Disk Drive • CD-ROM Drive 1 • CD-ROM Drive 2 • DDS-format DAT Drive 	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>Stand-Alone Devices</p> <ul style="list-style-type: none"> • 660-Mbyte Hard Disk Drive • 5.25-inch Floppy Diskette Drive • Rewritable Optical Disk Drive • 8 mm Tape Drive (SCSI ID = 1 or 2) • Quarter-inch Cartridge Tape Drive 	<p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p> <p>_____</p>

¹ Devices internal to your host computer system.

² Devices external to your host computer system.

Installing Your Mass Storage System into a Cabinet

Your mass storage system may be shipped with additional parts required to install it into a 19-inch cabinet. Figure 1-3 shows the parts for installing the mass storage system into the HP C2785A/86A cabinets. Assemble the parts as follows:

1. Loosen several turns (but do not remove) the two screws on the front clamp and the two screws on the rear clamp.
2. Slide the rack adapter into the C2785A/86A cabinet and install the four front screws.

Note



If the locking tabs on the cabinet rails do not allow the rack adapter to seat fully against the front columns, remove the locking tab screws and move the tabs further toward the rear.

3. Slide the locking tabs on the rails in your C2785A/86A cabinet forward until they engage into the slots in the rear of the rack adapter. Tighten the screws while pressing forward on the locking tabs.
4. Slide the mass storage system into the rack adapter until it stops.
5. Swing the front clamp up and install the front clamp tabs into the slots in the front of the mass storage system, then tighten the two front clamp screws.
6. Swing the rear clamp up and install the rear clamp tabs over the lip on the rear of the mass storage system.
7. Snap the external front panel assembly into place.

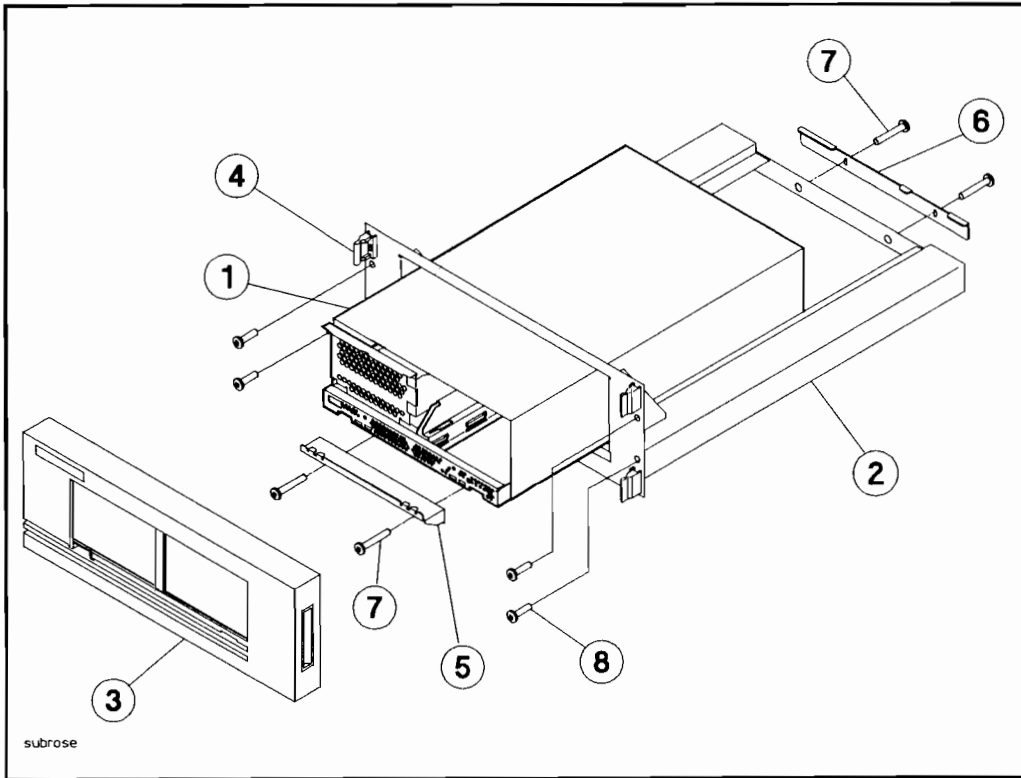


Figure 1-3. Installing the Mass Storage System into C2785A/86A Cabinets

- 1—Mass Storage System
- 2—Rack Adapter
- 3—External Front Panel
- 4—Front Panel Snaps

- 5—Front Clamp
- 6—Rear Clamp
- 7—Clamp Screws
- 8—Front Mounting Screws



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.
6. If necessary, remove the mass storage system from its rack or cabinet (see Figure 1-3).

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 Front Panel

To remove the front panel (see Figure 2-1):

1. Slide the front of the mass storage system beyond the edge of the table top until the front panel locking tabs (2) are exposed.
2. Press up on the front panel locking tabs until the front panel (1) releases from the mass storage system chassis.
3. Pull the bottom of the front panel forward, rotate the front panel up, and lift the front panel off the mass storage system.

Removing the Top Cover

Warning

Do not open the power supply. The power supply contains no customer-serviceable parts. Personal injury will result if the power supply is opened when power is applied.

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

1. Remove the two T15 screws (4) from the rear of the top cover.
2. Slide the top cover (3) one-half inch beyond the back of the mass storage system chassis, then lift the front of the top cover off of the mass storage system chassis. Figure 2-2 shows the components of the mass storage system chassis.

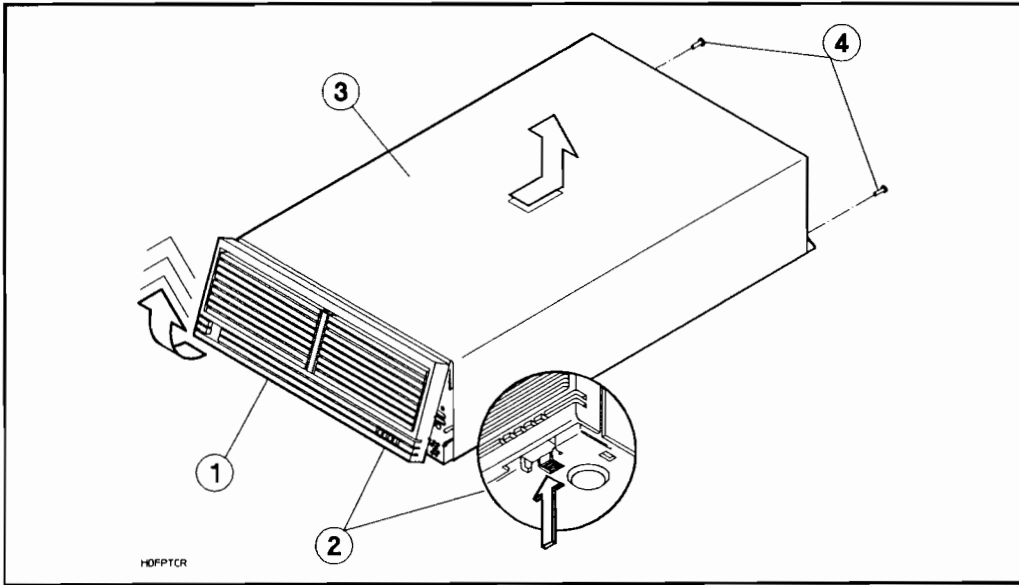


Figure 2-1. Removing the Front Panel and Top Cover

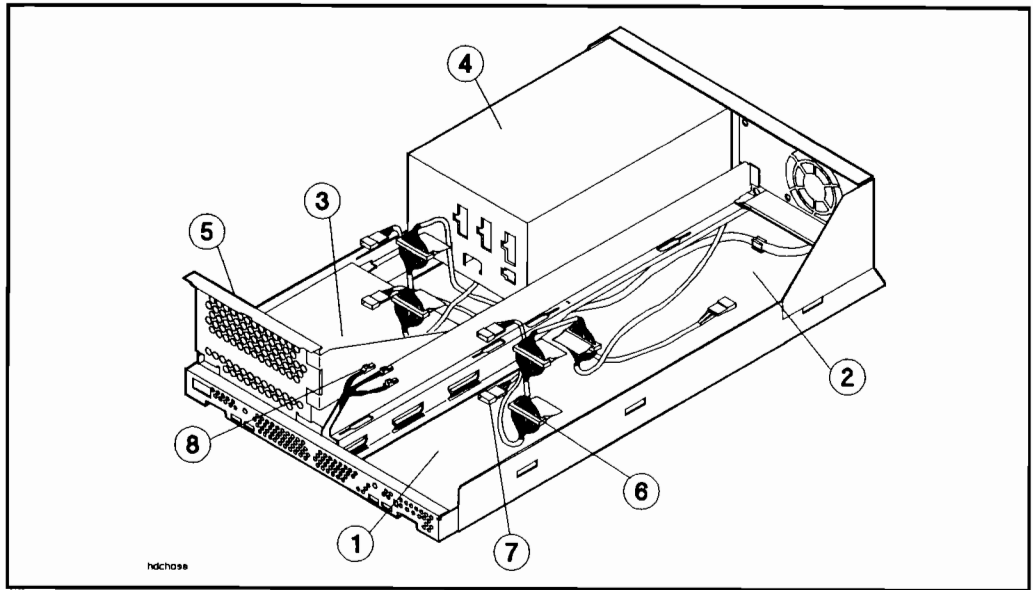


Figure 2-2. Mass Storage System Chassis

1—Slot 1/5

2—Slot 2

3—Slot 3/4

4—Power Supply

5—RFI Bracket

6—Slot 1 SCSI Connector

7—Slot 1 Address Connector

8—Slot 1 Status Connector

Removing the RFI Bracket

The mass storage system chassis is shipped with a radio frequency interference (RFI) bracket in empty front slots. The RFI bracket ensures the compliance of your mass storage system with RFI emission requirements when there is no device in a front slot.

If you are installing a device in either of the front slots, you must first remove the RFI bracket as follows (see Figure 2-3):

1. Remove the T25 screw (5) from the front of the chassis and the front of the RFI bracket (4).
2. Use a flat-bladed screwdriver to pry the RFI bracket toward the rear of the chassis.
3. Slide the RFI bracket toward the center of the chassis until the mounting tabs (2) stop against the ends of the mounting slots (3).
4. Lift the RFI bracket out of the chassis.

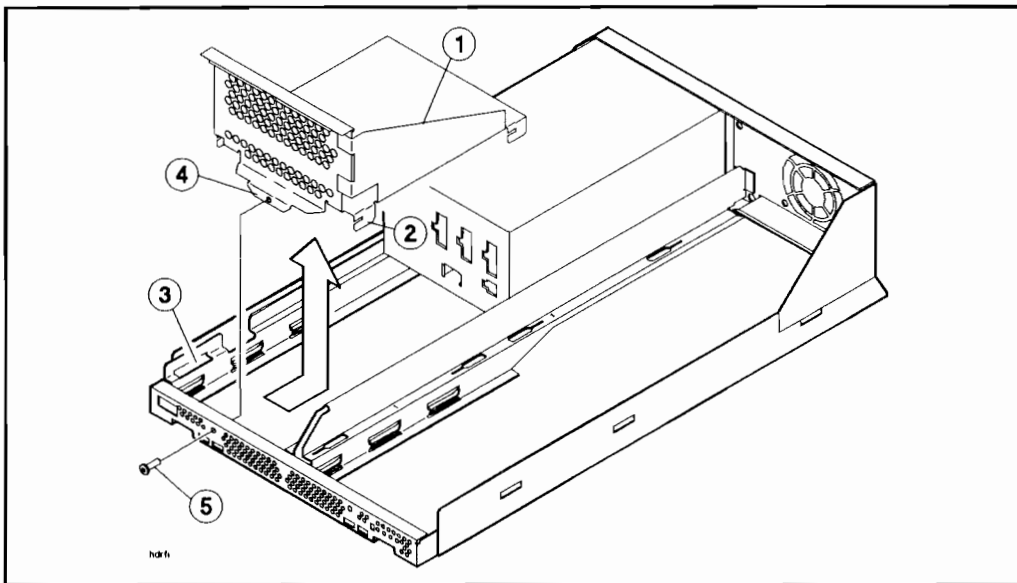


Figure 2-3. Removing the RFI Bracket

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 chassis.
 - 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.
-

This section shows how to install mass storage devices into your mass storage system. The figures in this section only show how to install a 5.25-inch hard disk drive and full-height bracket into slots 1/5, 2, and 3/4 of the mass storage system. However, all mass storage devices, except the nonembedded rewritable optical disk drive, are installed in the same manner as the 5.25-inch hard disk drive.

Note

- Refer to the *Mass Storage System Quick Reference Card* to determine the slots each device may be installed in.
 - Two half-high devices can be installed into one full-high bracket that occupies slots 1 and 5 or slots 3 and 4. Refer to the device *Installation Details* for information about adding a second half-high device to a full-high bracket.
-

Note



Whenever a 5.25-inch (full-height) device is installed in the front slots on one side of the mass storage system (slots 1/5 or slots 3/4), it is assigned to the lower of the two slot numbers on that side (slot 1 or slot 3, see Figure 2-4).

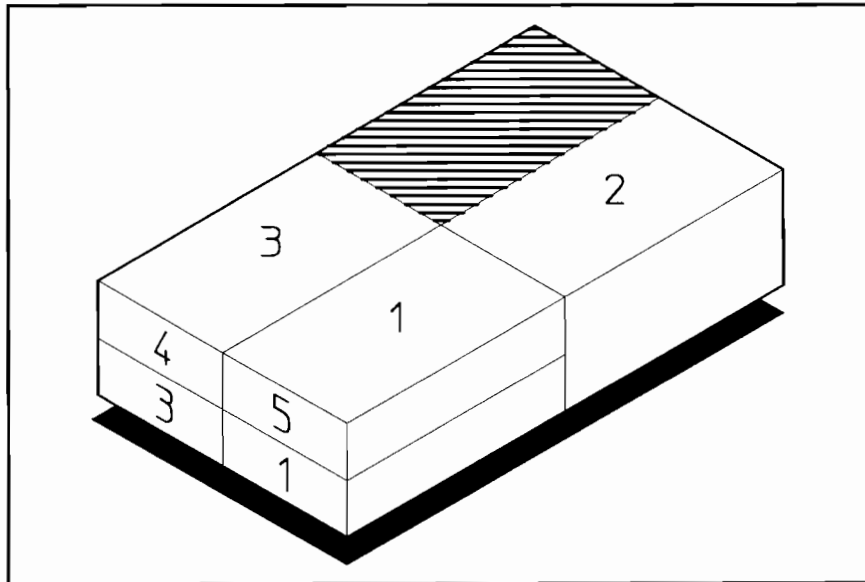


Figure 2-4. Slot Numbers and Default SCSI Addresses

Installing a Device into Slots 1/5 or Slots 3/4

Note

If you are installing a nonembedded rewritable optical disk drive into slot 1, refer to the *Hardware Installation Manual*, part number 5960-0884 for installation information.

To install a device into slots 1/5 or slots 3/5 (see Figure 2-5 or Figure 2-6):

1. Insert the four bracket mounting tabs (2) into the four bracket mounting slots (3) in the mass storage system chassis.
2. Push down on the device (1) and slide it toward the front of the mass storage system until the mounting tabs lock into the bracket mounting slots.
3. Tighten the bracket securing screw (5) through the chassis and into the bracket securing tab (4).

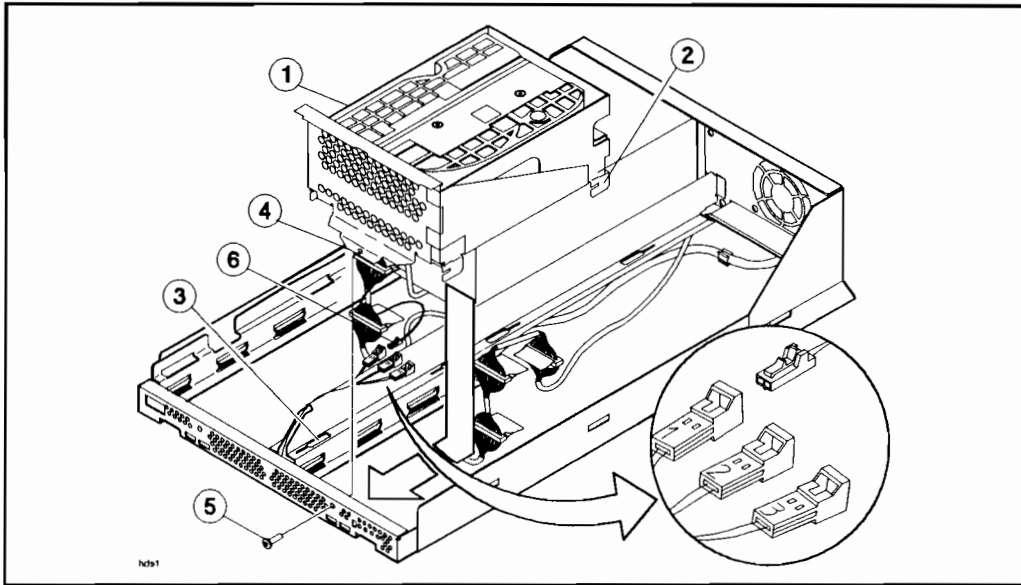


Figure 2-5. Installing a Device into Slots 1/5

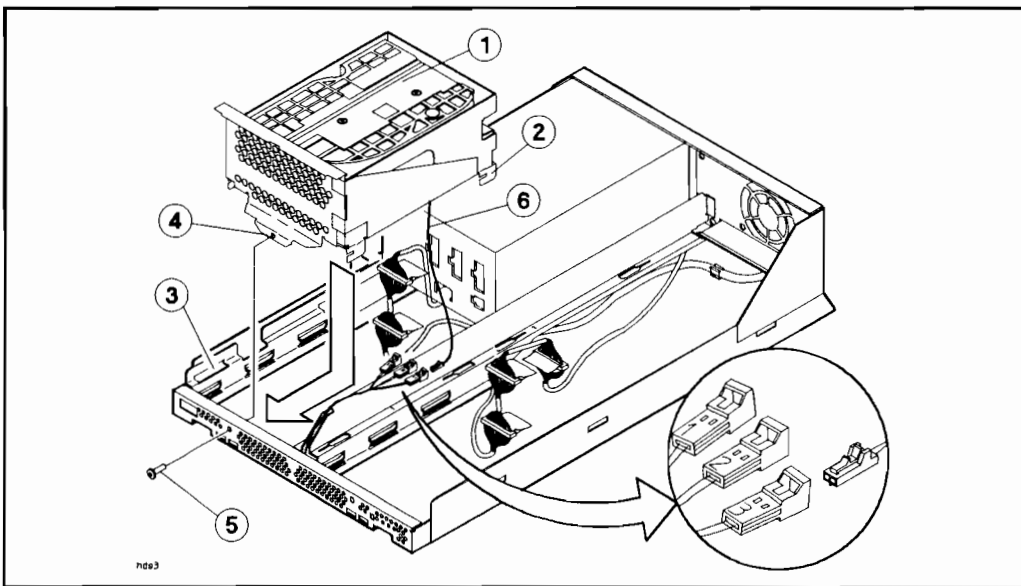


Figure 2-6. Installing a Device into Slots 3/4

2-10 Installing Mass Storage Devices

Installing a Device into Slot 2

To install a device into slot 2 (see Figure 2-7):

1. Insert the four bracket mounting tabs (2) into the four bracket mounting slots (3) in the mass storage system chassis.
2. Push down on the device (1) and slide it toward the rear of the mass storage system until the mounting tabs lock into the bracket mounting slots.
3. Tighten the bracket standoff (4) into the bracket securing tab, then tighten the bracket securing screw (5) through the chassis and into the bracket standoff.

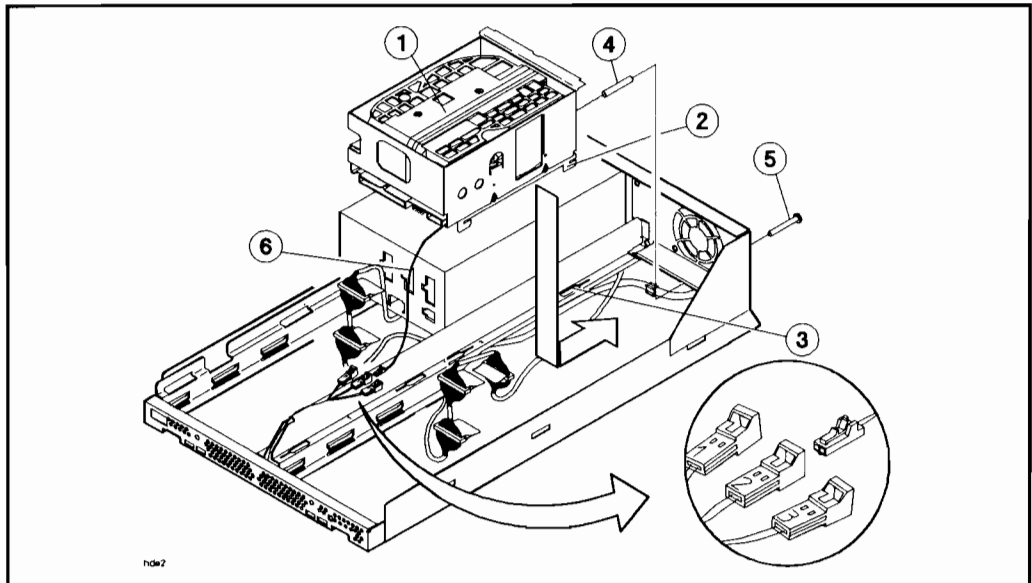


Figure 2-7. Installing a Device into Slot 2

Connecting Internal Cables

To connect the mass storage system internal cables (see Figure 2-2):

1. Connect the power cable (2) to the power supply (1) (see Figure 2-8).
2. Connect the other end of the power cable to the drive. (For two half-height drives in one bracket, connect one split end of the power cable to each drive.)
3. Connect the SCSI cable (slot number on the cable) to the drive.
4. Connect the internal address cable (slot number on the connector) to the drive address cable.
5. For 5.25-inch hard disk drives only, connect the drive status cable to the appropriate internal status cable (see 6 and inset in Figure 2-5, Figure 2-6, and Figure 2-7).

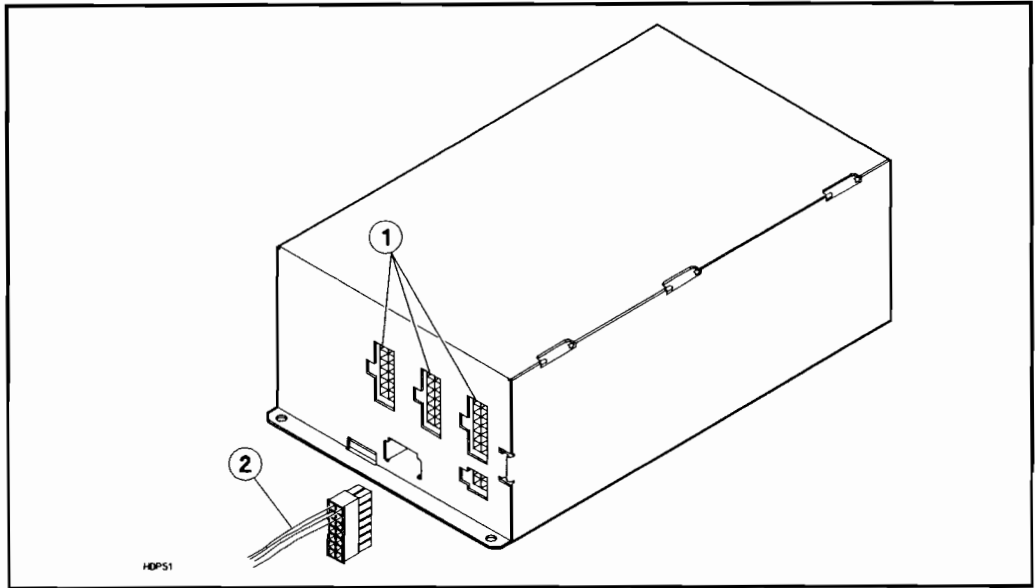


Figure 2-8. Connecting the DC Power Cable

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). The address of the host SCSI interface card is normally set to 7. The SCSI address switches on the mass storage system rear panel are marked underneath with mass storage system slot numbers (1-5), and are used to set a SCSI address for each device in your mass storage system (see Figure 1-2).

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 2-4):

- A half-height device uses the address corresponding to the slot number it occupies.
- A full-height device uses the address corresponding to the *lowest* slot number it occupies.

To set the device SCSI address:

1. Select a SCSI address not being used by other devices within the mass storage system.
2. For each device in a slot, set the switch segments on the corresponding SCSI address switch to the address selected (refer to Table 2-1).
3. Write the device SCSI address in Table 1-2.

Table 2-1. Mass Storage System Address Switches

SCSI Address	Switch 4	Switch 2	Switch 1
0	0	0	0
1	0	0	1
2	0	1	0
3	0	1	1
4	1	0	0
5	1	0	1
6	1	1	0
7 ¹	1	1	1

¹ Address 7 is normally reserved for the Host SCSI interface card.

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 Top Cover

To reinstall the top cover (see Figure 2-1):

1. Slide the top cover down over the mass storage system chassis so that the back of the top cover extends one-half inch beyond the rear of the mass storage system chassis, then slide the top cover forward into place.
2. Install and tighten the T15 top cover screws.

Reinstalling the Front Panel

To reinstall the front panel:

1. Remove the appropriate front panel bezels by pressing on both sides of a bezel with your thumb until the bezel pops out (see Figure 2-9).
2. Insert the front panel mounting tabs into the slots in the top cover and swing the front panel down until the LINE™ switch comes through the opening in the front panel (see Figure 2-1).
3. Push the bottom edge of the front panel into the front of the chassis until the front panel locking tabs engage.
4. Reconnect the SCSI cable and the power cord to the mass storage system rear panel.

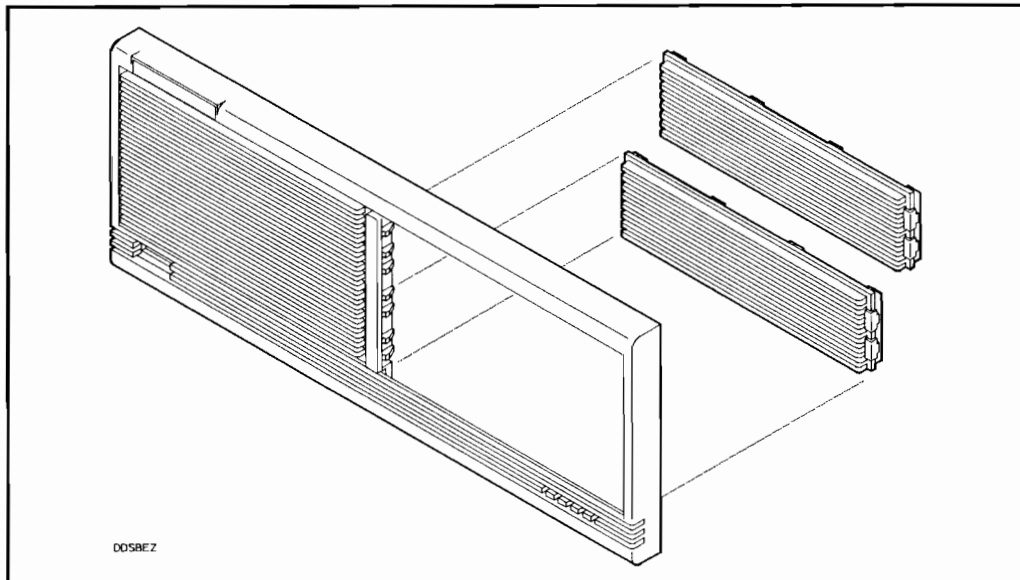


Figure 2-9. Removing the Front Panel Bezels

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.
6. Loosen the bracket securing screws.
7. Push down on the device and slide it toward the center of the mass storage system chassis.
8. Lift the device up and out of the mass storage system chassis.

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