StorageWorks™ *for OEMs*

Products from Digital Equipment Corporation

HA720W-Series High-Availability Pedestals
OEM Options Installation Guide

EK–HA72W–IG. A01

Revision 1.0

October 1995

Revision History		
Revision	**Date**	**Content**
1.0	October 18, 1995	Initial release

Table of Contents

FIGURES

TABLES

Pedestal Documentation Set Overview

This product specification is one of a series of documents that describe the operation, configuration, and capabilities of the HA720W-series high-availability pedestals. The following table describes where you can find information in this documentation set:

For information about…	See…
5.25-inch device mounting option installation	Chapters 6, 7, and 8
5.25-inch storage device installation	Chapter 6
Configuring the pedestal	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Configuring the storage controller	*SC4000-Series Storage Controllers OEM Product Specification*
Cooling the pedestal	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Dual bus option installation	Chapter 3
Dual pedestal storage controller	Chapter 8
EMU option installation	Chapter 5
Environmental monitor unit	*HA720W–Series High-Availability Pedestal OEM Product Specification*
High-availability storage subsystem fault bus	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Installing the pedestal	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Pedestal specifications	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Physical characteristics	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Power distribution	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Preliminary pedestal serving procedures	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Replacing pedestal components	*HA720W–Series High-Availability Pedestal OEM Product Specification*
SCSI bus characteristics	*HA720W–Series High-Availability Pedestal OEM Product Specification*
SCSI bus converter option installation	Chapter 4
Storage controller interfaces	*SC4000-Series Storage Controllers OEM Product Specification*
Storage controller option installation	Chapter 7
Storage devices interfaces	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Swapping storage devices	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Using the environmental monitor unit	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Using the pedestal	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Using the SCSI bus converter	*HA720W–Series High-Availability Pedestal OEM Product Specification*
Using the storage controller	*HA720W–Series High-Availability Pedestal OEM Product Specification*

1

Installing Pedestal Options

*This chapter describes the basic considerations for installing options in high-availability pedestals and the procedures common to all option installations. These common procedures are **prerequisites** for installing options.*

1.1 Installation Guide Overview

This chapter describes the considerations, recommended installation sequence, and preliminary procedures for installing options in a high-availability pedestal, commonly referred to as the "pedestal." You can install the options individually, or several at the same time. It is not possible to identify all the possible option installation combinations as this is a function of when you purchase the options. Each chapter describes the procedures for installing a single option. When installing multiple options, it may be necessary to combine procedures to simplify and expedite the installation process.

Each installation procedure is identified clearly and each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

1.2 Installing Multiple Options

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

Preferred Installation Sequence		Option Installation Instructions
1.	Install the pedestal base (SH02D).	See the *HA720W High-Availability Pedestal OEM Product Description.*
2.	Install the redundant power option (SHGZ4).	See Chapter 2.
3.	Install the dual bus option (SH02A).	See Chapter 3.
4.	Install the SCSI bus converter option (SHZ36).	See Chapter 4.
5.	Install the EMU option (SH02B).	See Chapter 5.
6.	Install the 5.25-inch storage device option (SH02C)	See Chapter 6.
7.	Install the storage controller options (SHZ66 or SHZ67).	See Chapter 7.
8.	Install the storage controller dual pedestal option (SH02E).	See Chapter 8.

1.3 Installing High-Availability Pedestal Options

Due to possible configuration conflicts or the complexity of the installation process, Digital recommends that you do not install the following combination of options in the same pedestal:

Do not install this option…		with these options…	
Description	**Option**	**Description**	**Option**
5.25-Inch Storage Device	N/A	Storage Controller with 16 MB Cache Storage Controller with 4 MB Cache	SHZ67 SHZ66
Dual Bus	SH02A	Dual Pedestal Storage Controller	SH02E
Dual Pedestal Storage Controller	SH02E	Dual Bus	SH02A
Environmental Monitor Unit	SH02B		
Pedestal Base	SH02D		
Redundant Power Supply	SHGZ4		
SCSI Bus Converter	SHZ36		
Storage Controller with 16 MB Cache	SHZ67	5.25-Inch Storage Device	
Storage Controller with 4 MB Cache	SHZ66	5.25-Inch Storage Device	

No restrictions.

You can install the pedestal option at any time, but some options require that you also install other options. Therefore, you must install *all* the related options to ensure proper operation. Installing a single option is a relatively straight-forward and simple procedure.

The information available in Table 1–1 includes the following:

- The high-availability pedestals options.
- The combination of options *required* to install an option in each model pedestal..

Table 1–1 Pedestal Options

To install this option …		in these pedestals, you must also install the following options…				
Description	**Option**	**SH024**	**SH025**	**SH026**	**SH3ZZ**	**SH31ZZ**
5.25-Inch Storage Device	SH02C	SH02B SHGZ4				
Dual Bus	SH02A					
Dual Pedestal Configuration	SH02E	SH02B SH02C SHZ6x SHGZ4	SH02A SHZ6x	SHZ6x		
Environmental Monitor Unit	SH02B					
Pedestal Base	SH02D					
Redundant Power Supply	SHGZ4					
SCSI Bus Converter	SHZ36					
Storage Controller with 16 MB Cache	SHZ67	SH02B SH02C SHGZ4	SH02A			
Storage Controller with 4 MB Cache	SHZ66	SH02B SH02C SHGZ4	SH02A			

Option standard on this pedestal.

No other option required.

Option cannot be installed.

1.4 How to Remove the Side Cover

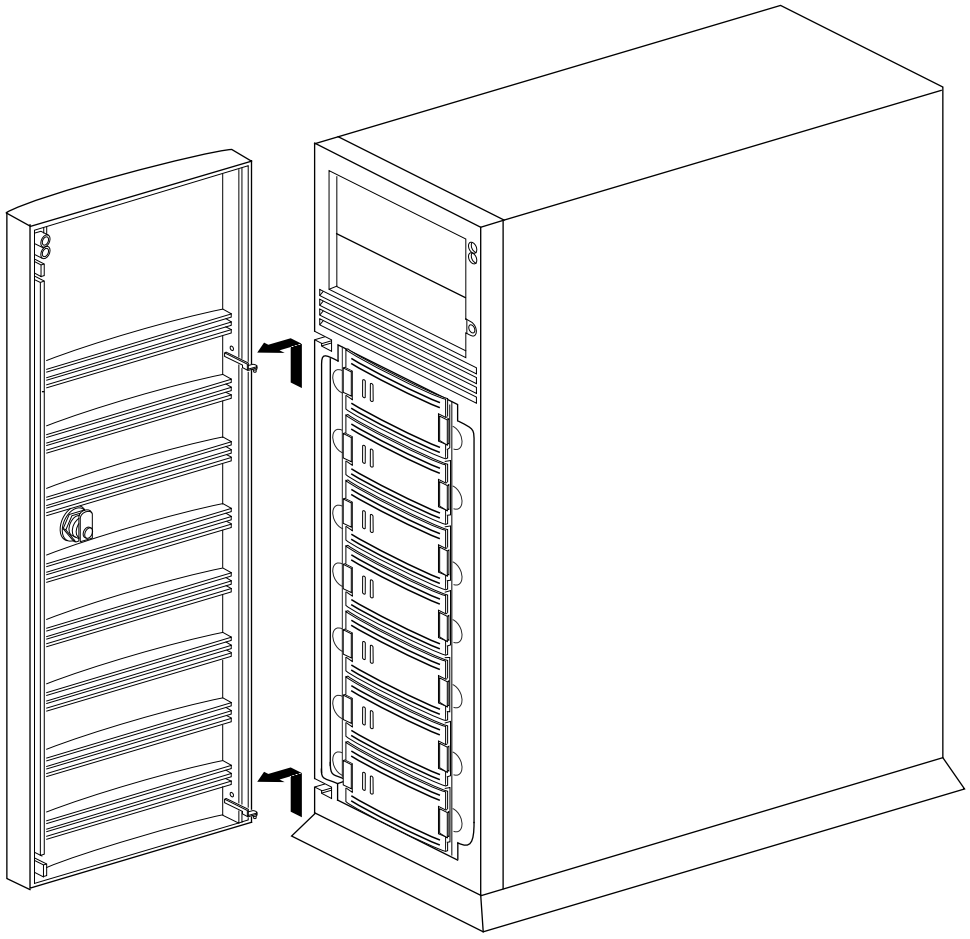
You must remove the left side cover to configure the pedestal, move internal SCSI cables, or install options. This requires you to complete the following procedure:

1. Turn off the power to both the controller and the pedestal.
2. Disconnect the pedestal power cord.

WARNING

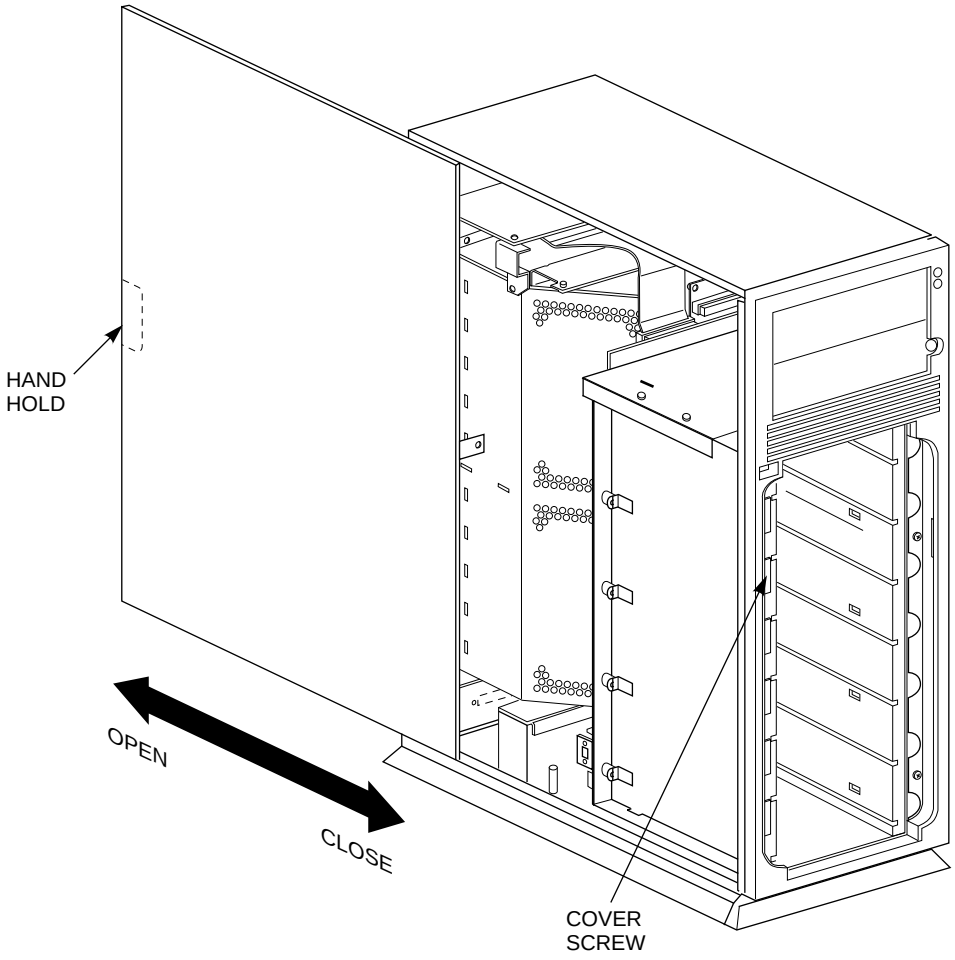
Dangerous voltages are present within the pedestal. To prevent electrical shock, always turn the off pedestal and disconnect the pedestal power cords before removing the side cover.

3. Disconnect the external SCSI bus cables.
4. Open the door to a 90° angle in relation to the pedestal as shown.
5. Carefully lift up on the door until the hinge pins are against the top of mounting holes.
6. Pull the door straight out until the hinge pins clear the bezel.



CXO-5030A-MC

7. Remove the left side cover screw.
8. Grasp the side cover rear hand hold and slide the cover to the rear until you can lift the cover up and remove it.



CAUTION

When the pedestal side cover is open, there is no air flow through the SBBs. Therefore, never operate the pedestal with the side cover open.

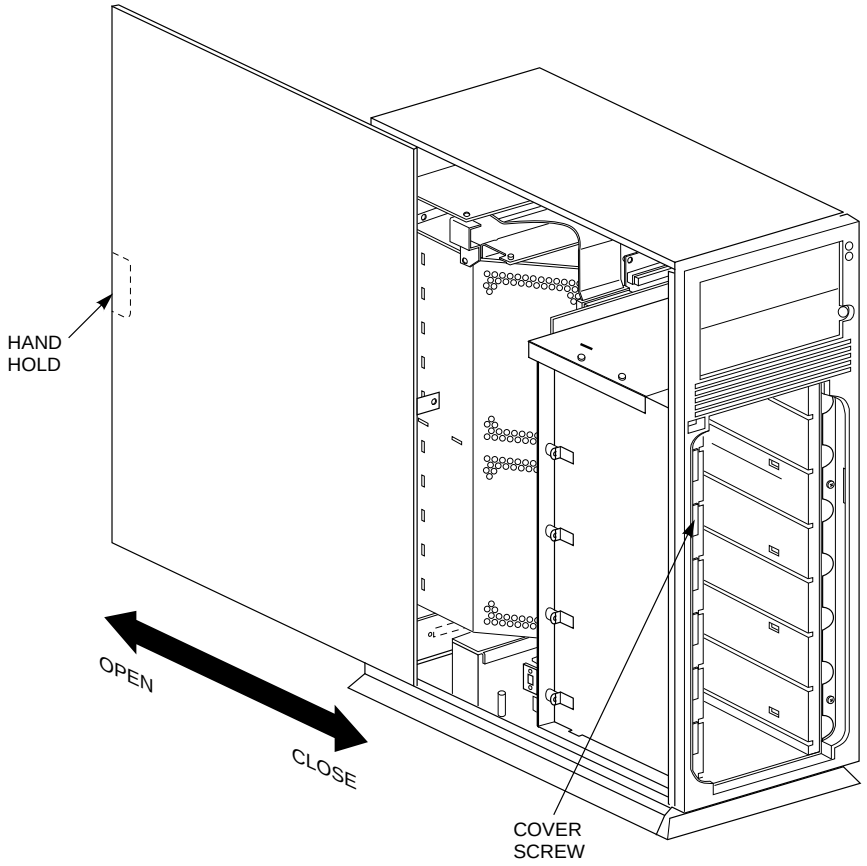
1.5 How to Test the Pedestal

After you have completed installing an option or servicing the pedestal, complete the following procedure to replace the side cover and test the pedestal for proper operation:

CAUTION

To maintain proper cooling, always replace the side cover before applying power.

1. Align the side cover with enclosure and insert the top edge of the cover into the pedestal.
2. Seat the bottom edge of the cover in the pedestal, and while pushing in on the cover, slide it forward until it fully seats.
3. Install the side cover mounting screw.

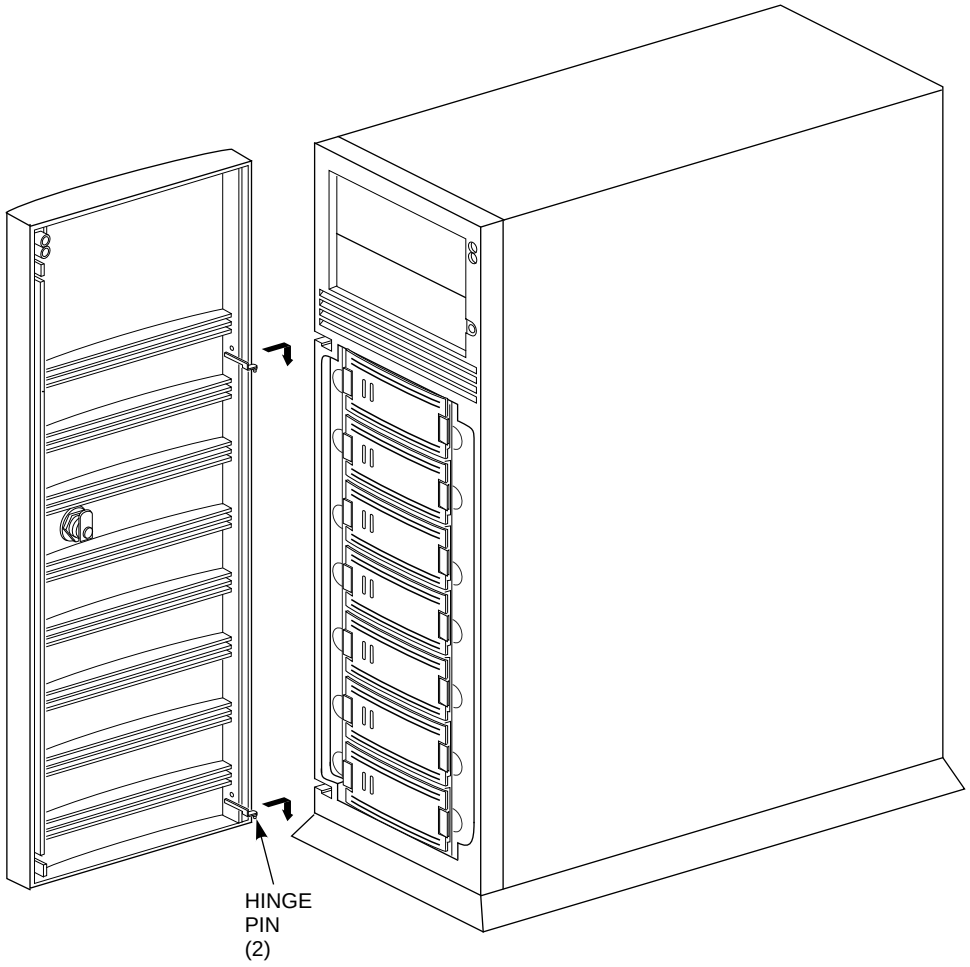


4. Connect the external SCSI bus cables.
5. Connect the pedestal power cords.
6. Turn on the pedestal.
7. Observe the LEDs on the pedestal and the devices and check for proper operation.

1.6 How to Mount the Door

Complete the following procedure to mount the door:

1. Position the door at a 90° angle in relation to the pedestal.
2. Align the hinges with *both* the top and the left side of the mounting holes.
3. Insert the hinges into the bezel until they are the rear of the mounting holes.
4. Gently lower the door until the hinge pins are fully seated in the bezel.



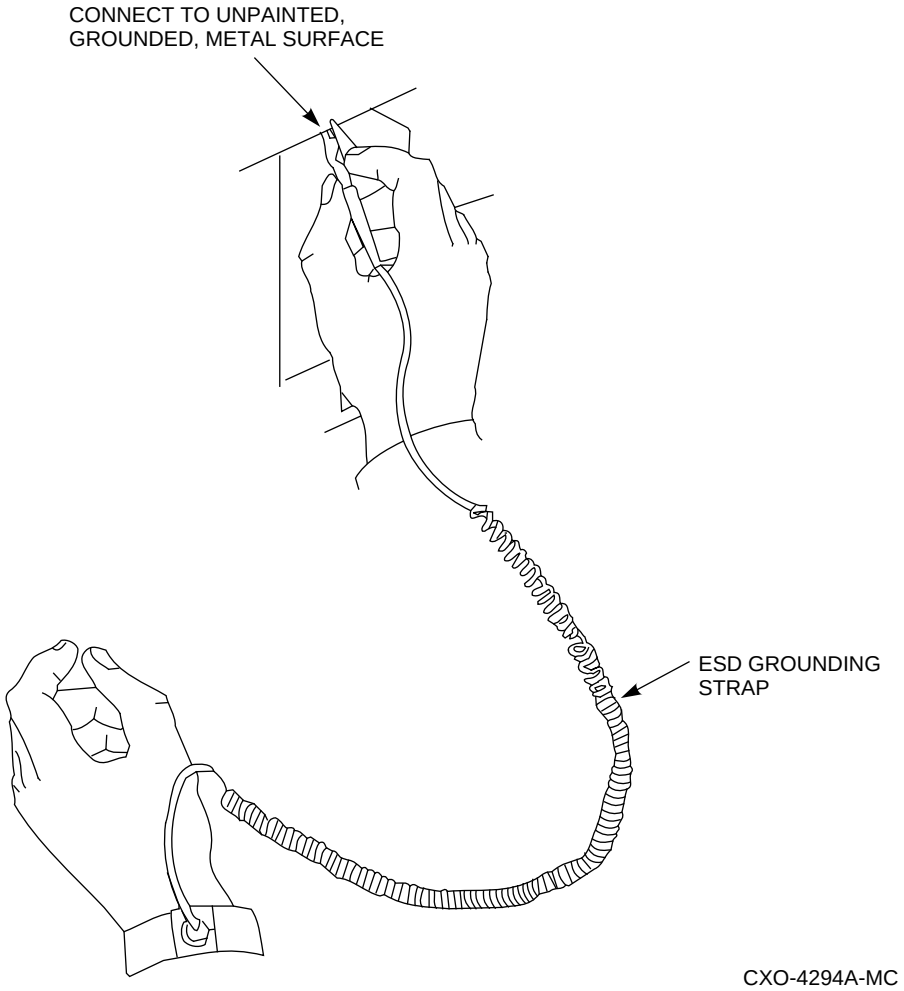
CXO-4554A-MC

1.7 How to Provide ESD Protection

Electrostatic discharge (ESD) can damage storage devices. To prevent this, you must take the following precautions:

- Either place an ESD mat on the work surface before starting the procedures and then place the components on the mat during assembly,
  or
  Wear an ESD wrist strap whenever you handle any of the electronic components (see Figure 1–1).
- Do not touch the device connectors.

Figure 1–1 Using the ESD Strap



2

Installing a Redundant Power Supply

This chapter describes the procedure for installing the redundant power supply option in a high-availability pedestal.

NOTE

This option is a prerequisite for installing the EMU, the 5.25-inch storage devices, and the storage controller options.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. **Install the redundant power option (SHGZ4).**
3. Install the dual bus option (SH02A).
4. Install the SCSI bus converter option (SHZ36).
5. Install the EMU option (SH02B).
6. Install the 5.25-inch storage device option (SH02C).
7. Install the storage controller options (SHZ66 or SHZ67).
8. Install the storage controller dual pedestal option (SH02E).

2.1 How to Prepare for the Installation

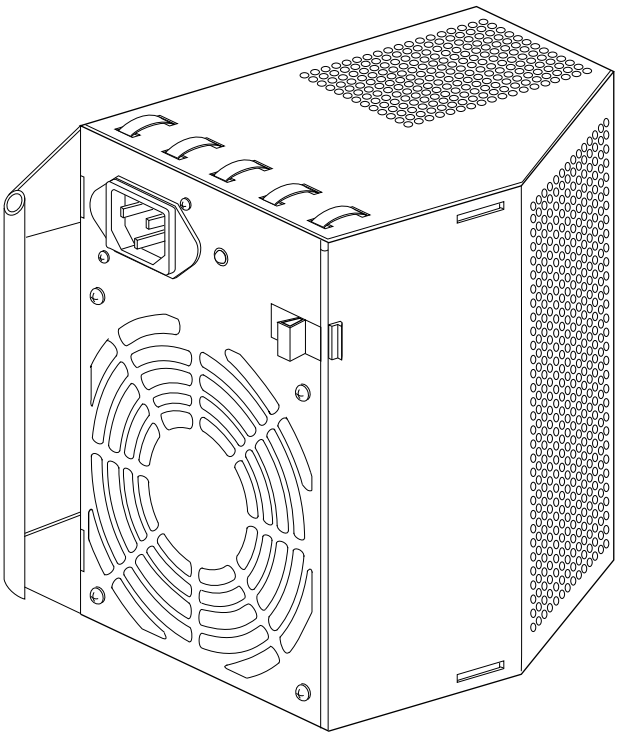
Installing this option requires you to do the following:

1. Review this chapter to become familiar with the installation procedures and the components.
2. Complete the preliminary procedures described in Chapter 1, “Installing the Pedestal Options.”
3. Set the power module backplane and the EMU jumpers.
4. Install the power supply
5. Install the side cover.
6. Test the pedestal for proper operation.

2.2 What You Need to Complete the Installation

Table 2–1 describes the materials you need to install this option.

Table 2–1 Redundant Power Option Materials

Redundant Power Supply Option Parts	Qty
204 W Power supply with cooling fan	1
 CXO-5012A-MC	
User Supplied Materials	
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	

2.3 How to Install the Redundant Power Supply

NOTE

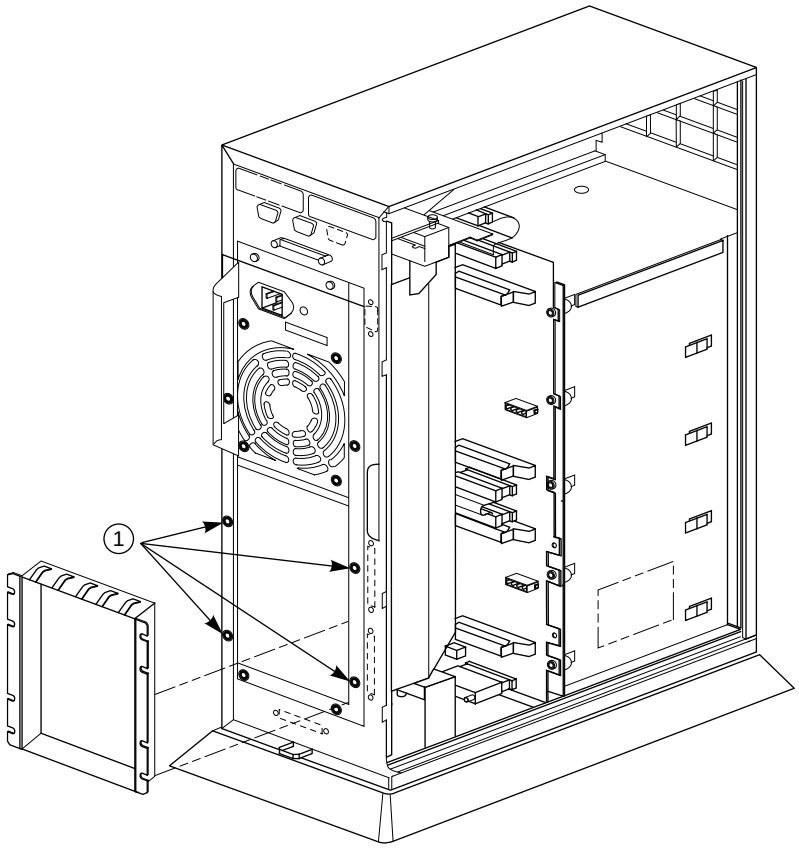
Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

After you turn off the power and remove the side cover as described in Section 1.4, complete the following procedure to install the redundant power supply option:

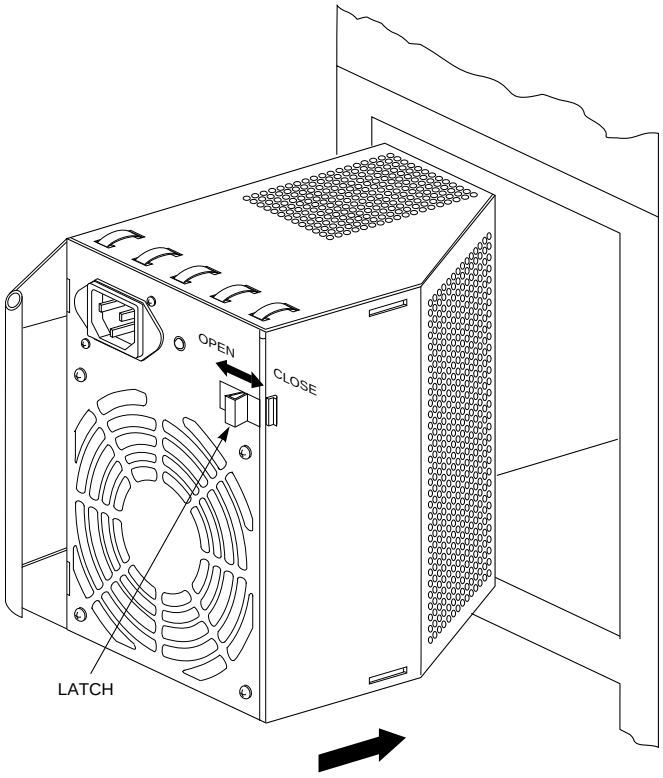
NOTE

You do not need to disconnect the SCSI bus cables..

1. Remove the four screws from the power supply blank panel. Remove the blank panel. Insert the four screws into pedestal rear panel and tighten.

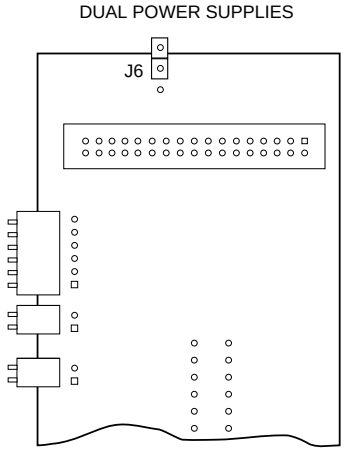


2. Align the redundant power supply with power supply module connector. Slide the power supply in and firmly seat it. Be sure that the latch engages.



CXO-5018A-MC

3. On the power module backplane, place the jumper on only one pin of connector J6 (the dual power supply configuration).



CXO-5019A-MC

4. Test the pedestal for proper operation by completing the procedure in Section 1.5.

THIS COMPLETES THE REDUNDANT POWER SUPPLY OPTION INSTALLATION PROCEDURE.

3

Installing a Dual Bus

This chapter describes the procedure for installing the dual bus option in a high-availability pedestal.

The pedestal can operate as either a single SCSI bus (up to 9 devices) or a dual SCSI bus (a 6 device bus and a 3 device bus). Converting from a single bus to a dual bus is simply a matter of installing the option cables and the terminator. Operating in the dual bus mode enables you to use different controllers with each bus. Converting from a dual bus to a single bus involves disconnecting the dual bus cables from the backplane and installing the single bus jumper cable.

CAUTION

When converting from a *dual bus* configuration to a *single bus* configuration, **do not** remove the dual bus cable connectors from the rear panel. Removing these connectors will disrupt the air flow through the pedestal and can cause overheating.

The dual bus configuration provides the capability of using two external or internal SCSI bus controllers to control devices in a pedestal. You can "split" the SCSI bus backplane into an upper bus (Bus "A") of four devices and a lower bus (Bus "B") of three devices. Depending upon the controller, the bus width, and the bus speed, you may have the option of extending either bus to another pedestal. With the 5.25-inch storage device mounting option, you can install two half-height 5.25-inch storage devices. This expands the capacity of the upper bus to six devices. The total capacity of the pedestal is now nine devices. The only configuration restriction is that the 5.25-inch devices must have unique, 8-bit SCSI bus device addresses.

When you implement this option there are multiple possible configurations. This chapter discusses only the basic four device bus and three device bus configuration.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. Install the redundant power option (SHGZ4).
3. **Install the dual bus option (SH02A).**
4. Install the SCSI bus converter option (SHZ36).
5. Install the EMU option (SH02B).
6. Install the 5.25-inch storage device option (SH02C).
7. Install the storage controller options (SHZ66 or SHZ67).
8. Install the storage controller dual pedestal option (SH02E).

3.1 How to Prepare for the Installation

Installing the dual bus option requires you to do the following:

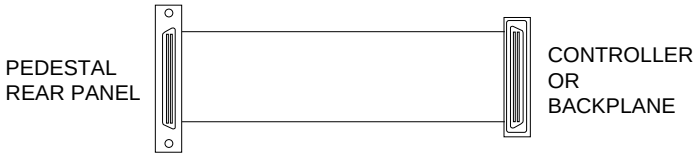
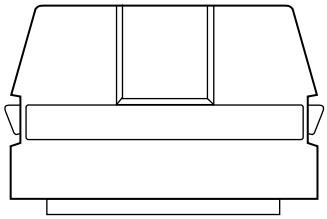
1. Review this chapter to become familiar with the installation procedures and the components.
2. Determine the preferred configuration and the maximum length of each SCSI bus as described in the "Configuring a Pedestal" chapter in the *HA720W High-Availability Pedestal OEM Product Specification.*

   The maximum length of each bus determines whether you can extend the bus to another pedestal, that is, "daisy chain" the pedestals.
3. Check each device address to be sure that every device *on the same bus* has a unique SCSI bus address.
4. Complete the preliminary procedures described in Chapter 1, "Installing the Pedestal Options."
5. Install the internal cables and terminators
6. Install the side cover.
7. Test the pedestal for proper operation.

3.2 What You Need to Complete the Installation

Table 3–1 describes the materials you need to install this option.

Table 3–1 Dual Bus Option Materials

Dual Bus Option Parts	Qty
Input/Output Cable, 68-conductor, 398 mm (11.75 in) long  CXO-4970A-MC	3
Terminator (typical)  CXO-4957A-MC	1
Mounting Hardware	
Screw 2–56 x 0.1875 in	6
Washer, flat	6
User Supplied Materials	
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	

3.3 How to Install the Dual Bus Option

NOTE

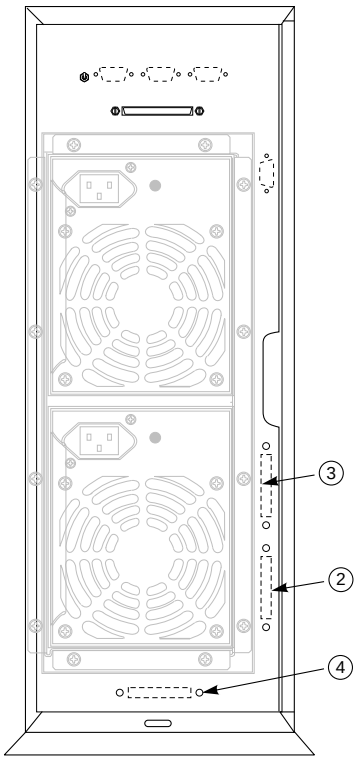
Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

After you turn off the power, disconnect the SCSI cables, and remove the side cover as described in Section 1.4, complete the following procedure to connect the dual bus cables:

1. Remove the jumper cable between backplane connectors J11 and J16.

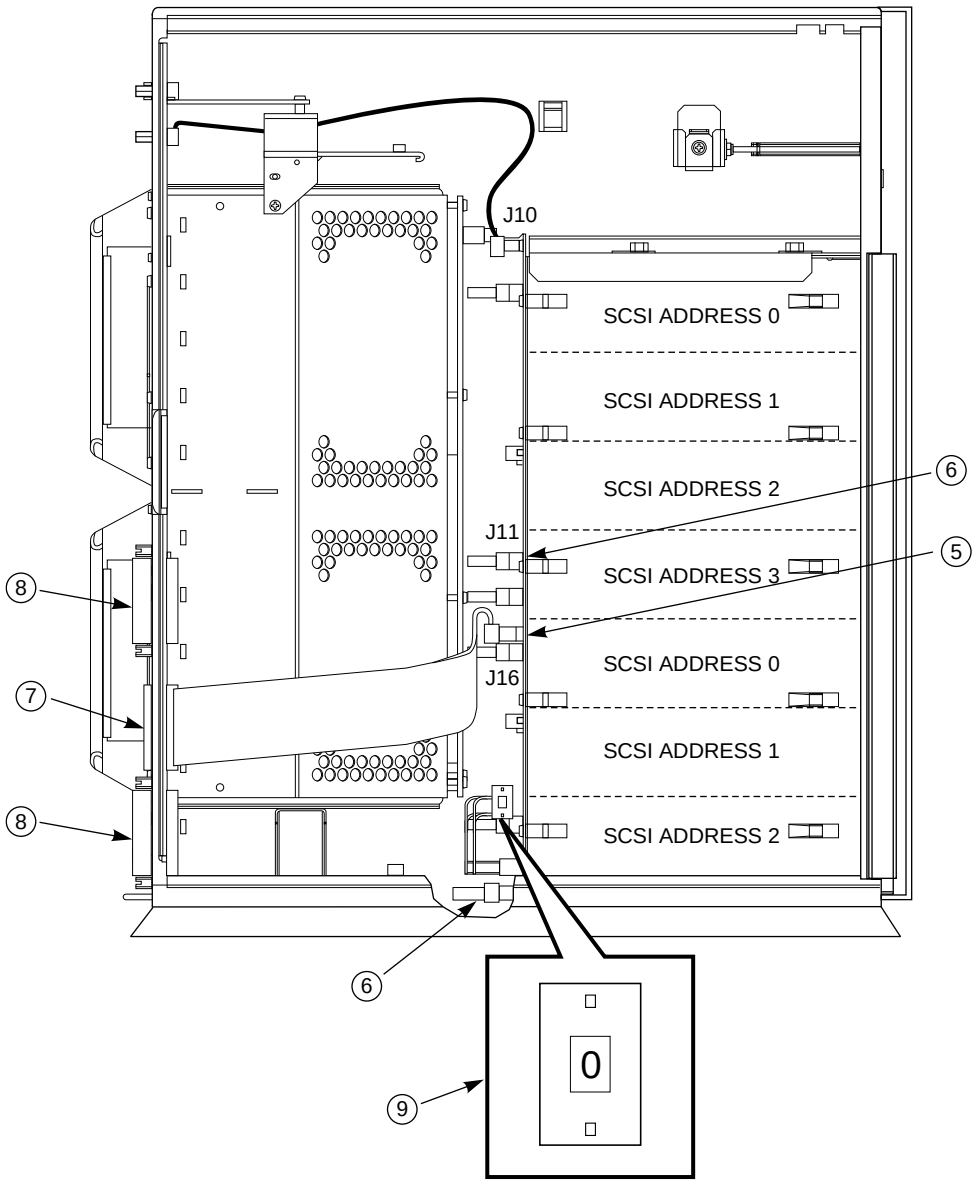
CXO-4971A-MC

2. Remove the Bus “B” input connector “knockout” panel from the rear panel.
3. When Bus “A” is not terminated on the backplane, remove the Bus “A” output connector knockout from the rear panel
4. When Bus “B” is not terminated on the backplane, remove the Bus “B” output connector knockout from the rear panel



CXO-5034A-MC

5. Connect the Bus “B” input cable to backplane connector J16.
6. Based on your configuration connect either terminators or I/O cables to backplane connectors J11 (Bus “A” output) and J17 (Bus “B” output).
7. Mount the Bus “B input cable connector on the rear panel.
8. For each bus that *is not terminated on the backplane*, mount an output cable connector on the rear panel.
9. Set the configuration address switch to address **0.**



10. Test the pedestal for proper operation by completing the procedure in Section 1.5.

4

Installing the SCSI Bus Converter

This chapter describes the procedure for installing the differential to single-ended SCSI bus converter (order number SHZ36) in a high-availability pedestal.

NOTE

If you also are installing the SCSI bus converter option, Digital recommends that you install it at the same time.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. Install the redundant power option (SHGZ4).
3. Install the dual bus option (SH02A).
4. **Install the SCSI bus converter option (SHZ36).**
5. Install the EMU option (SH02B).
6. Install the 5.25-inch storage device option (SH02C).
7. Install the storage controller options (SHZ66 or SHZ67).
8. Install the storage controller dual pedestal option (SH02E).

4.1 How to Prepare for the Installation

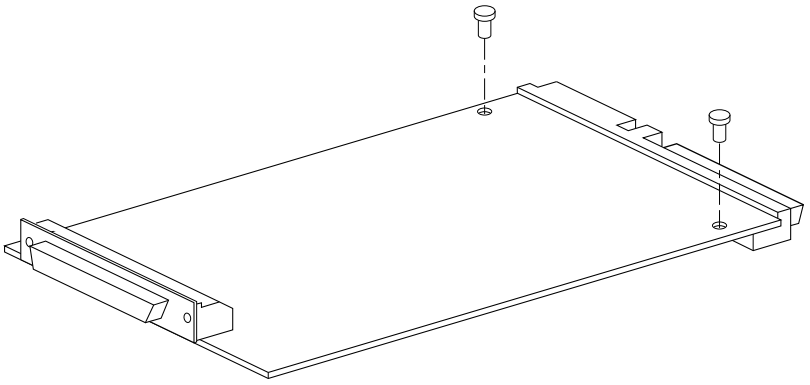
Installing the SCSI bus converter option requires you to do the following:

1. Review this chapter to become familiar with the installation procedures and the components.
2. Mount the SCSI bus converter.
3. Install the internal cables and terminators.
4. Install the side cover.
5. Connect the external SCSI bus cable.
6. Test the pedestal for proper operation.

4.2 What You Need to Complete the Installation

Table 4–1 describes the materials you need to install this option.

Table 4–1 SCSI Bus Converter Option Materials

SCSI Bus Converter Option Parts	Qty
16–Bit SCSI Bus Signal Converter	1
 CXO-5037A-MC	
Mounting Hardware	
Standoff	2
Screw, Phillips head, 6–32 x 0.250 in with lock washer	2
User Supplied Materials	
Electrostatic Discharge (ESD) protection	A/R
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	
StorageWorks Solutions DWZZB 16—Bit SCSI Bus Converter OEM Product Specification	

4.3 How to Install the SCSI Bus Converter Option

NOTE

Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

After you turn off the power, disconnect the SCSI cables, and remove the side cover as described in Section 1.4, complete the following procedure to install the EMU option:

NOTE

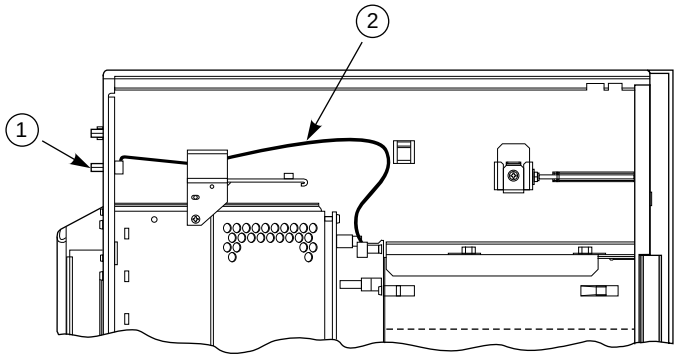
If you also are installing the EMU option, Digital recommends that you install both options at the same time. See Section 5.3 for the procedures for installing both options.

1. For pedestals with the EMU option installed, GO TO STEP 3.

   Remove the rear panel standoffs from the 68-pin input cable connector.

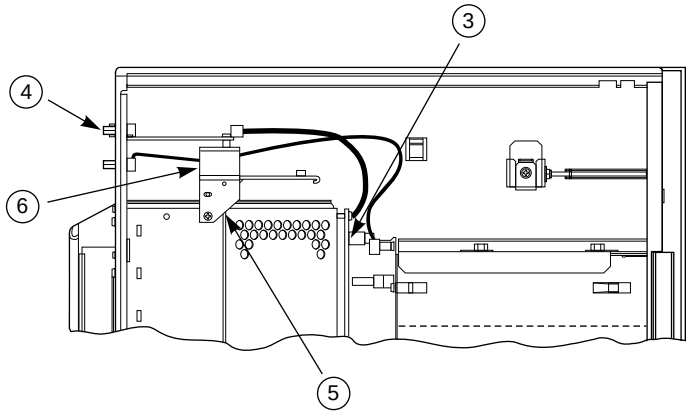
2. Feed the 68-conductor input cable through the mounting bracket towards the front of the pedestal.

   GO TO STEP 5.



CXO-5046A-MC

3. Disconnect the EMU cable from the power module backplane.
4. Remove the rear panel EMU connector standoffs.
5. Remove the option mounting bracket screw.
6. Remove the mounting bracket.



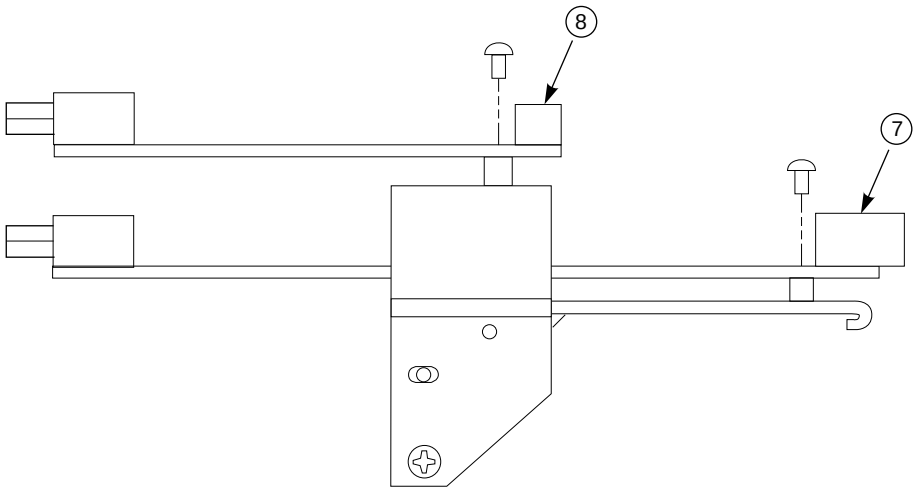
CXO-5047A-MC

CAUTION

Electrostatic discharge (ESD) can damage storage devices. To prevent this, you must take the following precautions:

- Either place an ESD mat on the work surface before starting the procedures and then place the components on the mat during assembly,
  or
  Wear an ESD wrist strap whenever you handle any of the electronic components (see Section 0).
- Do not touch the device connectors.

7. Mount the SCSI bus converter on the bracket.
8. Mount the EMU on the on the bracket.



9. Align the EMU connectors, the EMU switch, and the SCSI bus converter connector, with the knockouts in the rear panel. Install the mounting bracket using the screw removed Step 5.

   DO NOT FULLY TIGHTEN THE MOUNTING SCREW.

10. Insert the standoffs with lock washers, through the rear panel into the EMU and the SCSI bus connectors.

    DO NOT FULLY TIGHTEN THE STANDOFFS.

11. Tighten the standoffs and the mounting bracket screw.
12. Connect the dc power cable to the SCSI bus converter.
13. Connect the 68-conductor input cable to the SCSI bus converter output connector.
14. Connect the 34-conductor pedestal cable to the EMU.
15. Test the pedestal for proper operation by completing the procedure in Section 1.5.

5

Installing the EMU

This chapter describes the procedures for installing the EMU option in a high-availability pedestal.

NOTE

This option is a prerequisite for installing either a 5.25-inch storage device or a storage controller and is usually installed in a pedestal with redundant power supplies. All procedures are based on this configuration.

If you also are installing the SCSI bus converter option, Digital recommends that you install it at the same time.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. Install the redundant power option (SHGZ4).
3. Install the dual bus option (SH02A).
4. Install the SCSI bus converter option (SHZ36).
5. **Install the EMU option (SH02B).**
6. Install the 5.25-inch storage device option (SH02C).
7. Install the storage controller options (SHZ66 or SHZ67).
8. Install the storage controller dual pedestal option (SH02E).

5.1 How to Prepare for the Installation

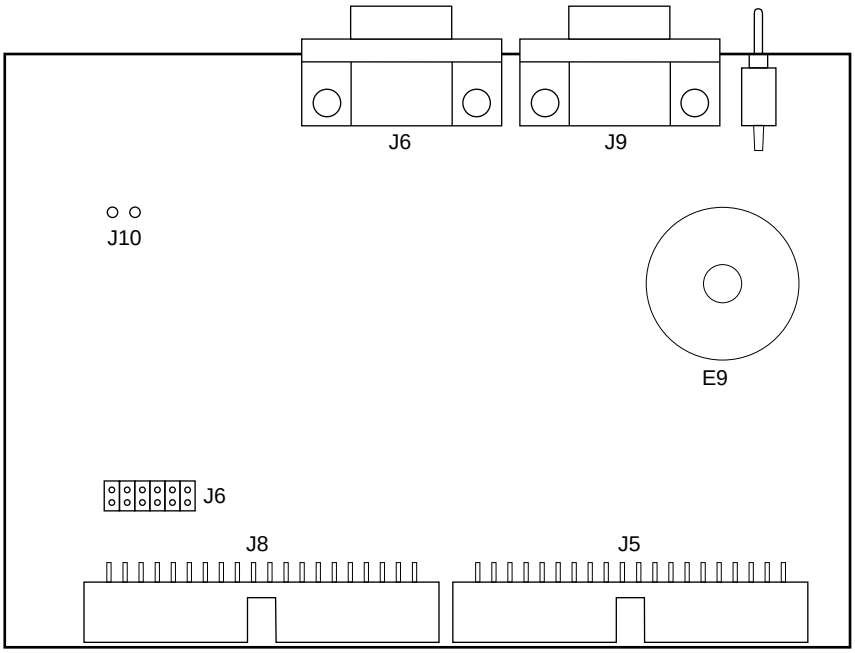
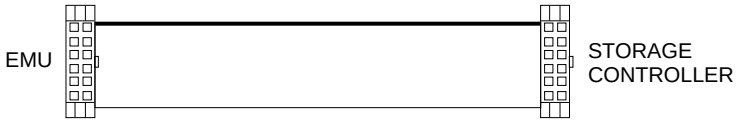
Installing this option requires you to do the following:

1. Review this chapter to become familiar with the installation procedures and the components.
2. Determine requirements for installing the SHELF_OK cable.
3. Remove the pedestal rear panel EMU connector and switch panels (“knockouts”).
4. Configure the EMU for either single or redundant power supply operation.
5. Mount the EMU PCB.
6. Connect the EMU to pedestal module backplane.
7. Install the SHELF_OK cables (optional).
8. Test the pedestal for proper operation.

5.2 What You Need to Complete the Installation

Table 5–1 describes the materials you need to install this option.

Table 5–1 EMU Option Materials

EMU Option Parts	Qty
EMU PCB  CXO-5035A-MC	1
Cable assembly 34 conductor, 191 mm (7.5 in) long  CXO-4980A-MC	1
Mounting Hardware	
Lock washer, external tooth	4
Standoff	4
Screw, Phillips head, 6–32 x 0.250 in with lock washer	2
User Supplied Materials	
Electrostatic Discharge (ESD) protection	A/R
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	

5.3 How to Install the EMU Option

NOTE

Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

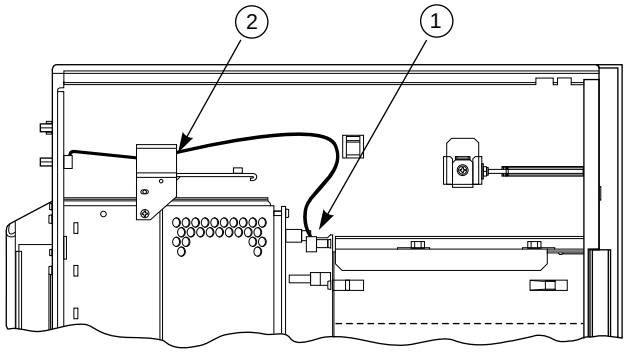
After you turn off the power, disconnect the SCSI cables, and remove the side cover as described in Section 1.4, complete the following procedure to install the EMU option:

NOTE

Digital recommends that you install the SCSI bus converter option and the EMU option at the same time.

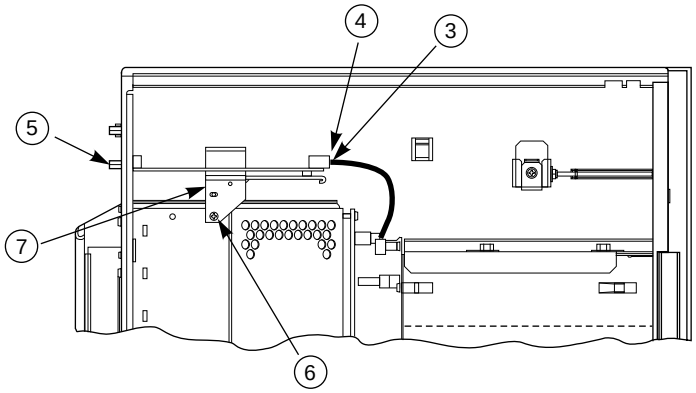
1. For pedestals with the SCSI bus converter option installed, GO TO STEP 3.
   Disconnect the 68-conductor I/O cable from the SCSI bus backplane.
2. Feed the I/O cable through the mounting bracket towards the pedestal rear panel.

   GO TO STEP 6.



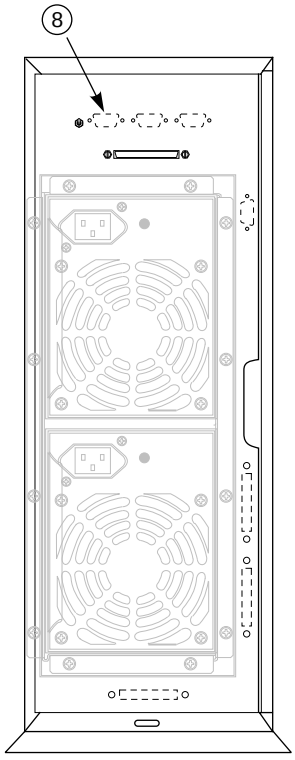
CXO-5048A-MC

3. Disconnect the I/O cable from the SCSI bus converter.
4. Disconnect the dc power cable for the SCSI bus converter.
5. Remove the rear panel SCSI bus converter connector standoffs.
6. Remove the option mounting bracket screw.
7. Remove the mounting bracket.



CXO-5049A-MC

8. Remove the rear panel EMU connector “knockout” panels.



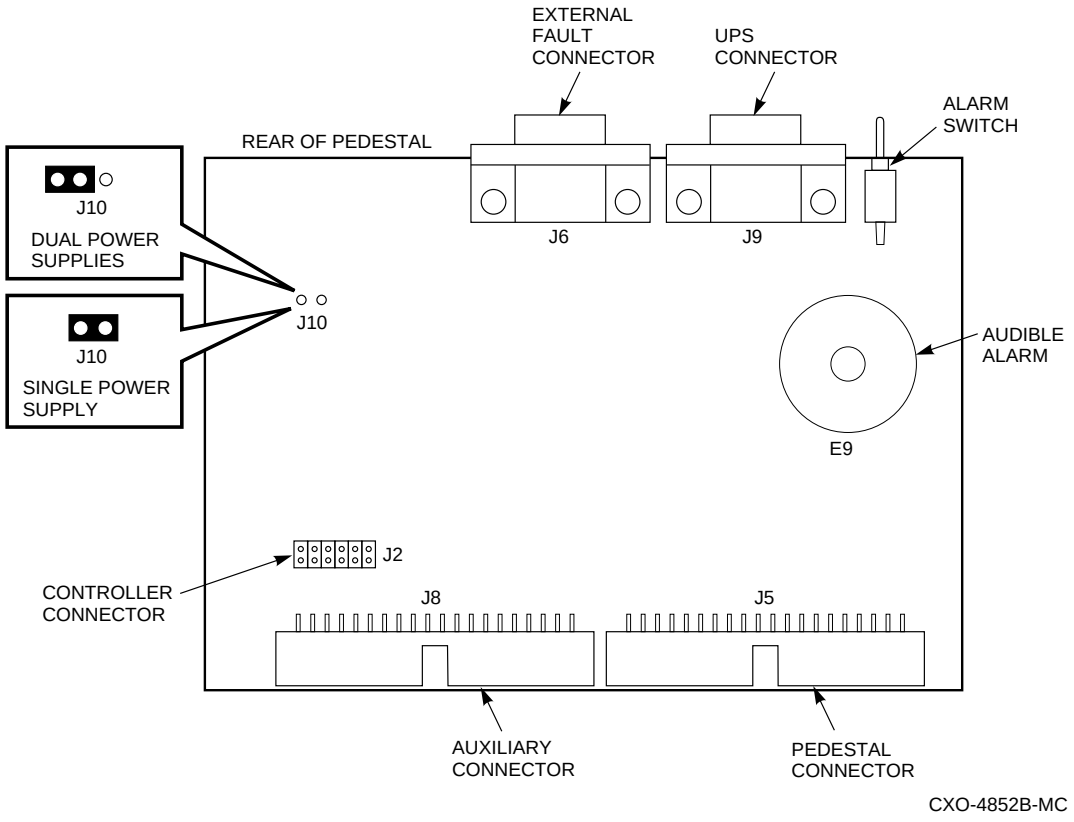
CXO-5050A-MC

CAUTION

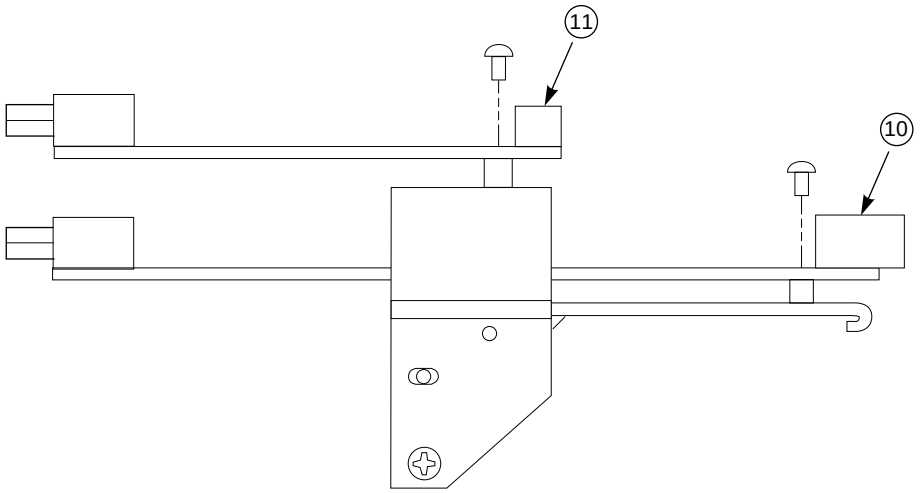
Electrostatic discharge (ESD) can damage storage devices. To prevent this, you must take the following precautions:

- Either place an ESD mat on the work surface before starting the procedures and then place the components on the mat during assembly,
  or
  Wear an ESD wrist strap whenever you handle any of the electronic components (see Section 0).
- Do not touch the device connectors.

9. Set the jumper on the EMU PCB for either single or dual power supply operation.

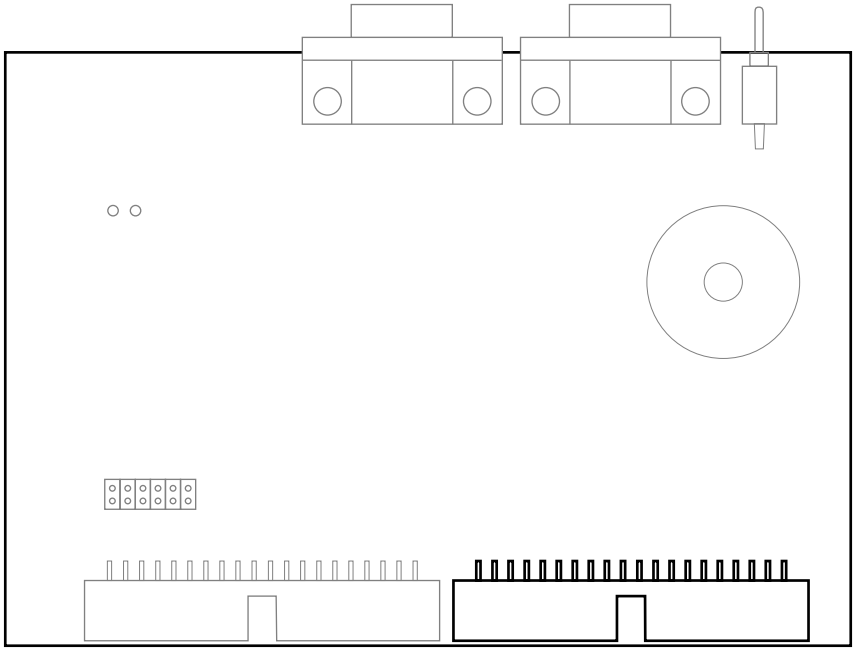


10. Mount the SCSI bus converter on the bracket.
11. Mount the EMU on the on the bracket.



CXO-5061A-MC

12. Connect the 34-conductor pedestal cable to EMU connector J5.



CXO-4996A-MC

13. WHEN INSTALLING THE SCSI BUS CONVERTER GO TO STEP 14.

    Feed the 68-conductor I/O cable from the rear panel through the mounting bracket.

14. Align the EMU connectors, the EMU switch, and the SCSI bus converter connector, with the knockouts in the rear panel. Install the mounting bracket using the screw removed Step 6.
15. Do not fully tighten the mounting screw.
16. Insert the standoffs with lock washers, through the rear panel into the EMU and the SCSI bus connectors.
17. Do not fully tighten the standoffs.
18. Tighten the standoffs and the mounting bracket screw.
19. Connect the dc power cable to the SCSI bus converter.
20. Connect the 68-conductor I/O cable to the SCSI bus converter output connector.
21. Connect the 34-conductor pedestal cable to the top connector on the power module backplane.
22. When there is no SCSI bus converter, connect the 68–conductor I/O cable to SCSI bus backplane.
23. When the external SCSI bus controller can process the SHELF_OK signal, complete the procedure in Section 5.4.
24. Test the pedestal for proper operation by completing the procedure in Section 1.5.

5.4 How to Connect SHELF_OK to an External SCSI Controller

The EMU SHELF_OK signal can be processed by some *external* SCSI bus controllers. When the controller can process the signal, you will need to install the SHELF_OK cables. Two of these cables are supplied with each pedestal.

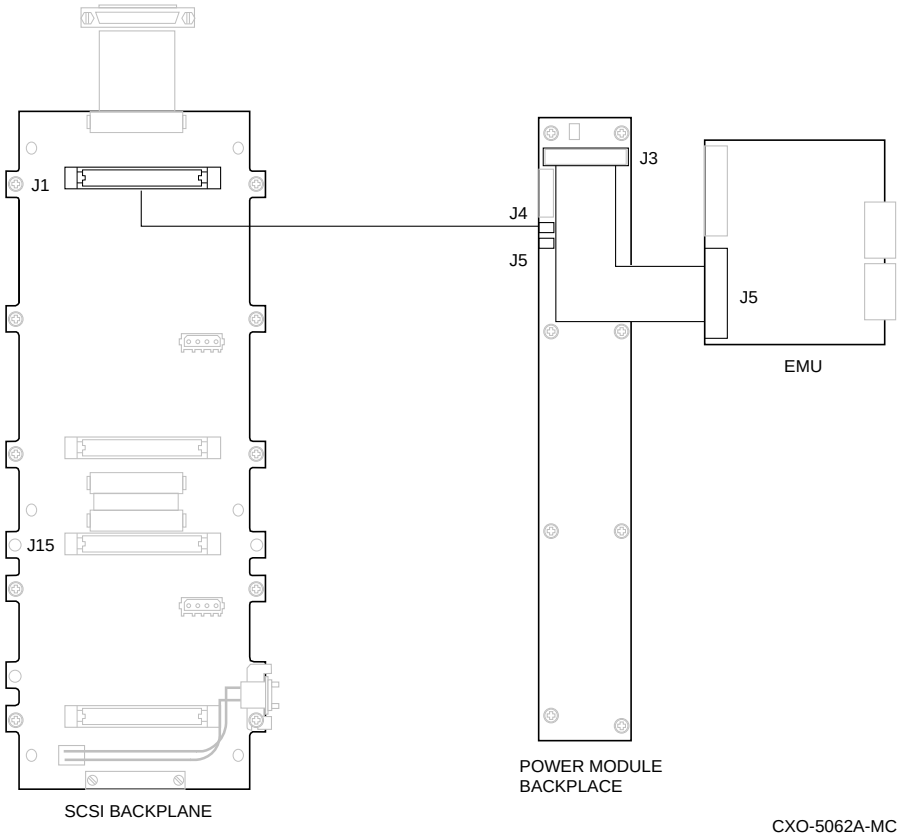
Complete the following procedure to route the SHELF_OK signal to a SCSI bus controller:

1. Is the SCSI bus backplane configured as single bus (jumper cable installed between connectors J11 and J16)?

   YES Go to Step 2

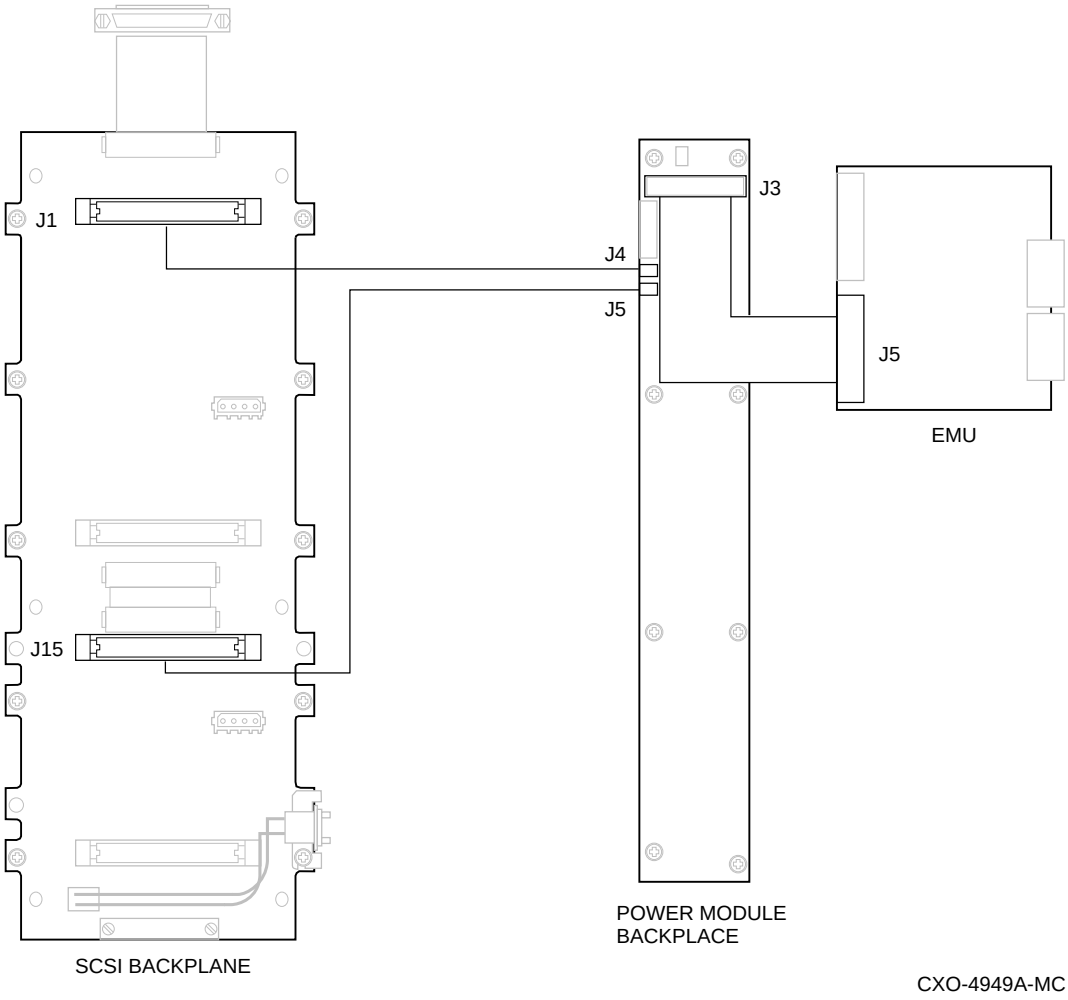
   NO: Go to Step 3.

2. Install the SHELF_OK jumper between either J4 or J5 on the power module backplane and one of the 50-pin connectors on the SCSI bus backplane.



THIS COMPLETES THE SINGLE BUS SHELF_OK INSTALLATION PROCEDURE.

3. Install a SHELF_OK jumper cable between the power module backplane and the SCSI bus backplane as shown.
4. Install the other SHELF_OK jumper cable between the power module backplane and the SCSI bus backplane.



THIS COMPLETES THE DUAL BUS SHELF_OK INSTALLATION PROCEDURE.

6

Installing a 5.25-Inch Storage Device

This chapter describes the procedure for installing a user-supplied 5.25-inch storage device using the 5.25-inch device mounting option.

You can install a *user-supplied* half-height or full-height 5.25-inch storage device in a high-availability pedestal using the 5.25-inch device mounting option. Digital recommends installing this option only in pedestals with an EMU and redundant power supplies. The procedures in this chapter are based on this configuration.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. Install the redundant power option (SHGZ4).
3. Install the dual bus option (SH02A).
4. Install the SCSI bus converter option (SHZ36).
5. Install the EMU option (SH02B).
6. **Install the 5.25-inch storage device option (SH02C).**
7. Install the storage controller options (SHZ66 or SHZ67).
8. Install the storage controller dual pedestal option (SH02E).

6.1 How to Prepare for the Installation

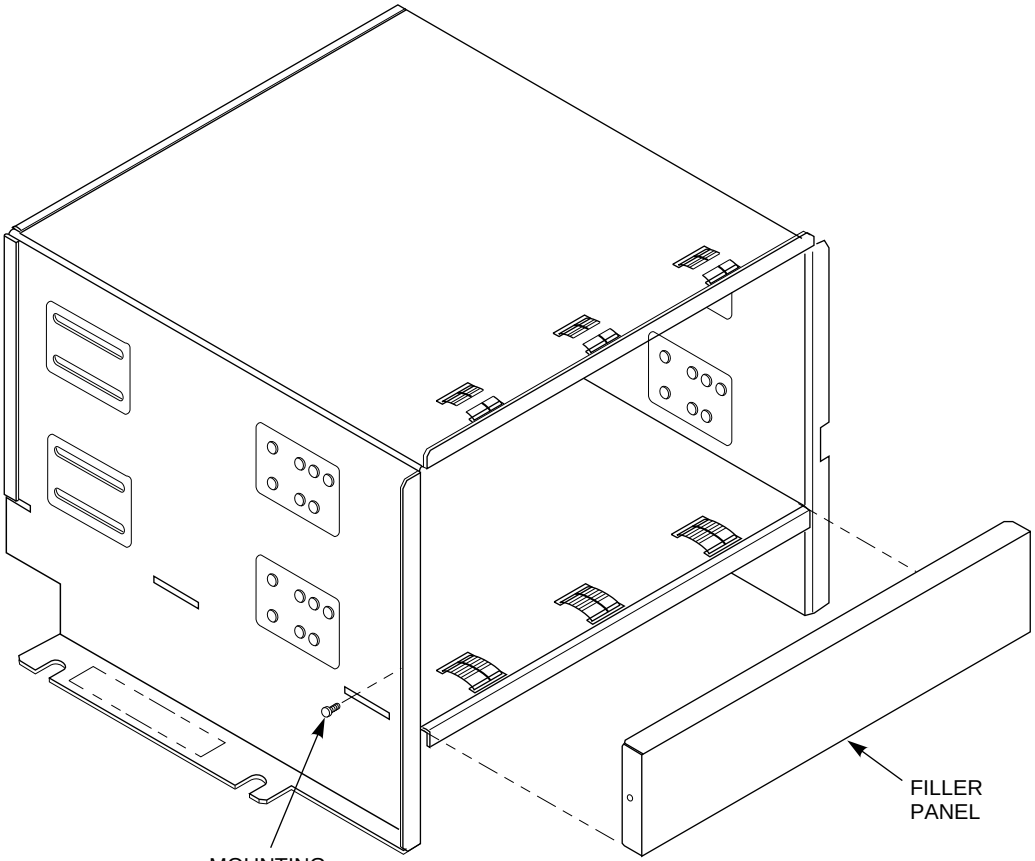
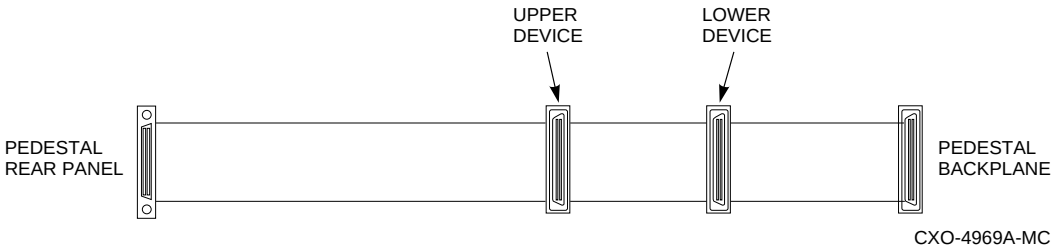
Installing this option requires you to do the following:

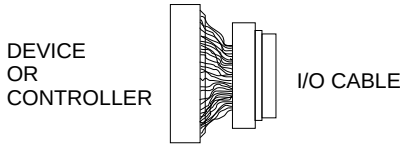
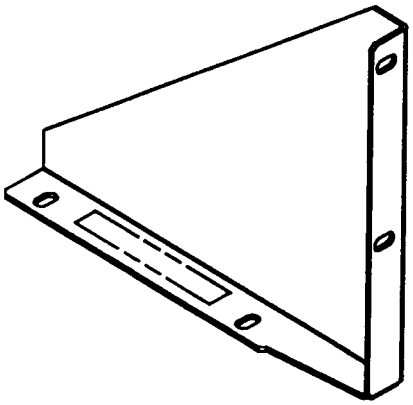
1. Review this chapter to become familiar with the installation procedures and the option materials.
2. Read the storage device publications so that you are familiar with the device and its components. Pay particular attention to:
   - Procedures for disabling the storage device internal SCSI bus termination.
   - Procedures for setting the storage device internal SCSI bus address.
3. Be sure that you have all the option materials listed in Section 6.2.
4. Disable the storage device internal SCSI bus termination as described in the device operator's manual or user's guide.
5. Set the storage device SCSI bus address as described in the device operator's manual or user's guide and Section 6.3.
6. Remove the device filler panels from the pedestal and the modular carrier (see Section 6.4).
7. Mount the storage device in the modular carrier and connect the cables (see Section 6.6).
8. Install the modular carrier and the angle bracket in the pedestal (see Section 6.7).
9. Test the pedestal for proper operation.

6.2 What You Need to Complete the Installation

Table 6–1 describes the materials you need to install this option.

Table 6–1 5.25-Inch Device Mounting Option Materials

5.25-Inch Device Mounting Option Parts	Qty
Modular carrier with filler panel	1
	
5.25-inch device 68-conductor input cable, 635 mm (25 in) long	1
	

Storage device adapter cable, 68-pin female to 50-pin female (part number 12-04009-**02**)	2
 CXO-4973A-MC	
Angle bracket	1
 CXO-4993A-MC	
Mounting Hardware	
Screw, 6–32 x 0.375 in	1
Screw, 6–32 x 0.187 in	8
Screw, M3 x 5 mm	8
User Supplied Materials	
Storage device operator's manual or user's guide	A/R
Compatible, 5.25-inch storage device *without* SBB	A/R
Electrostatic Discharge (ESD) protection	A/R
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	

6.3 How to Set the Device SCSI Address

See the "Configuring a Pedestal" chapter in the *HA720W High-Availability Pedestal OEM Product Specification* and select a *valid* device address for each device. *All devices on a single SCSI bus must have a unique address*. Set the device address per the manufacturer's instructions.

CAUTION

The only valid SCSI device addresses for the *8-bit* storage devices are 0 through 6.

When you set the device address, be sure that to disable the device internal SCSI bus termination.

6.4 How to Remove the Pedestal Filler Panel

NOTE

There are two device filler panels: one is in the pedestal, and one is in the modular carrier. The pedestal panel is always removed. You remove the modular carrier device filler panel when installing either a full-height device or a half-height device in the lower position. When installing a single, half-height device, install the filler panel in the unused location to control the air flow in the pedestal.

NOTE

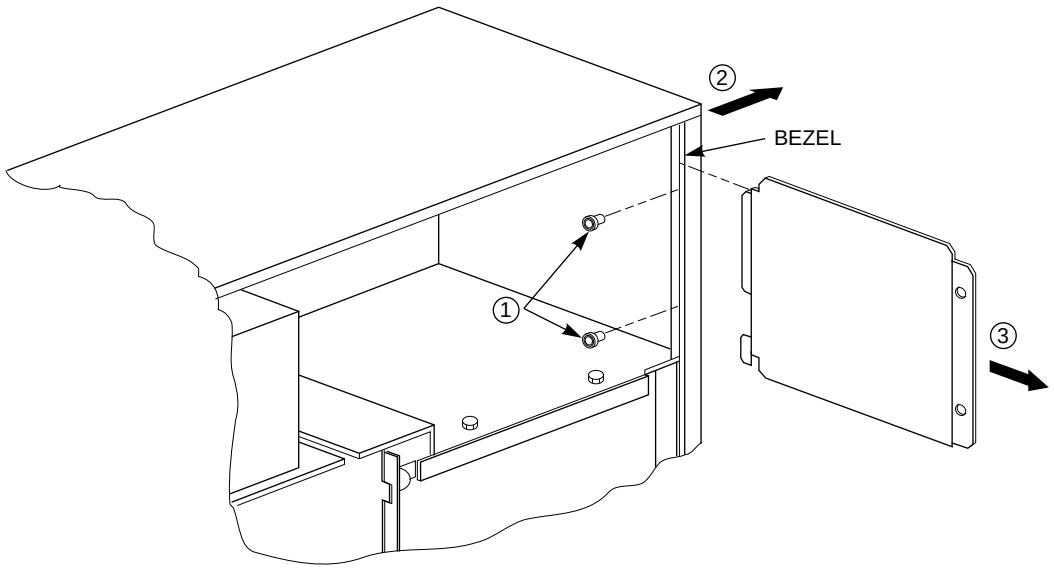
Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

After you turn off the power, disconnect the SCSI cables and remove the side cover as described in Section 1.4, complete the following procedure to remove the filler panels:

1. Remove the two mounting screws that secure the bezel.

   NOTE
   These screws are used to mount the angle bracket (see Section 6.7).

2. Gently push the bezel forward.
3. Pull out the filler panel.



CXO-5013A-MC

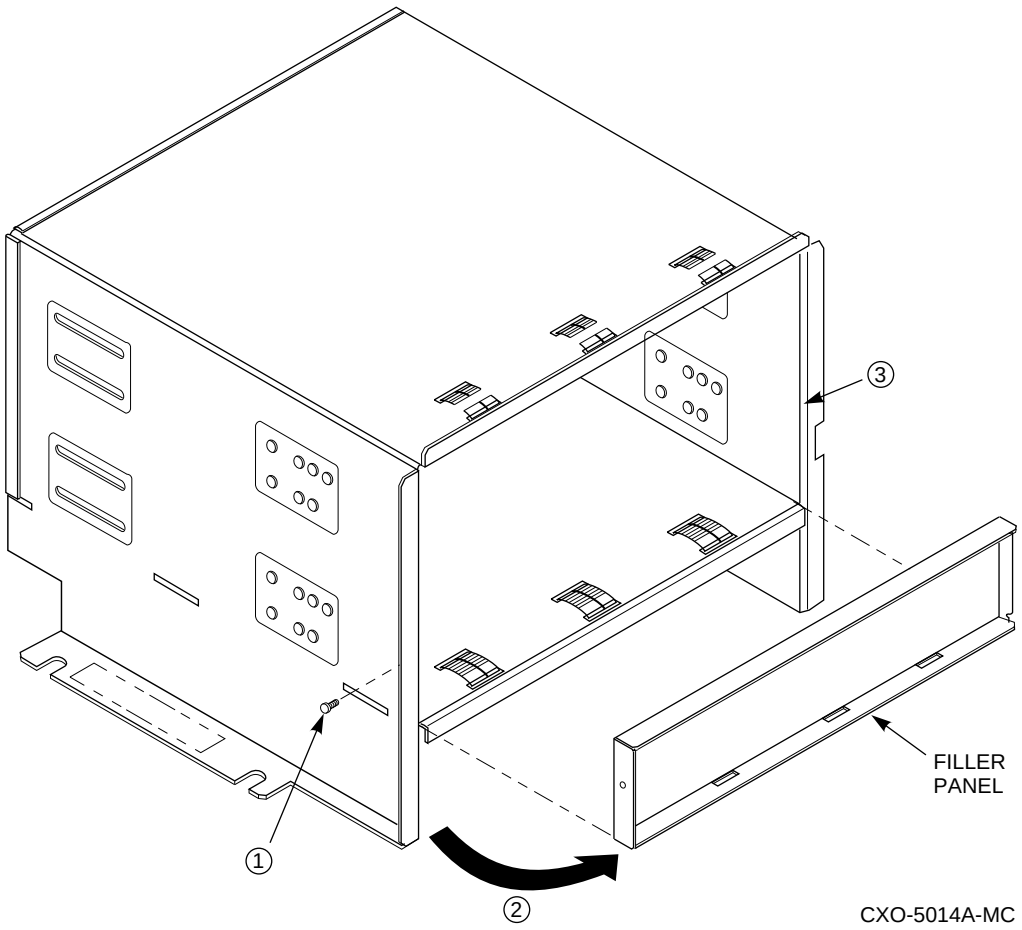
6.5 How to Remove the Modular Carrier Filler Panel

The modular carrier device filler panel is factory installed. When you install either a full-height device or a half-height device in the lower position, you must remove the panel by completing the following procedure:

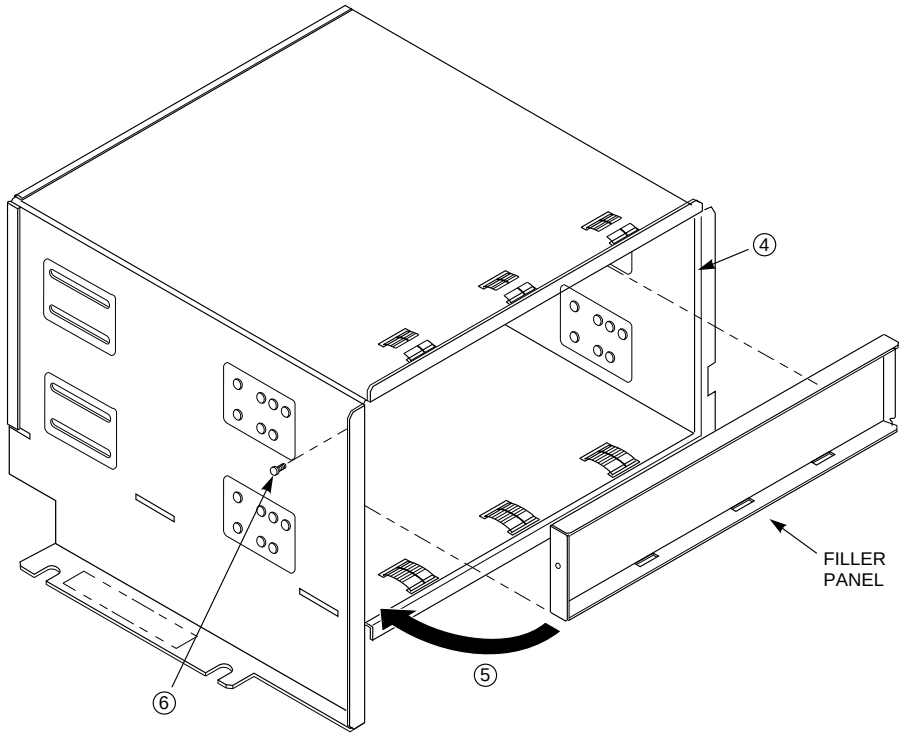
CAUTION

When you install a single half-height device, you must install the modular carrier device filler panel in the unused position to maintain air flow through the device and the power supply.

1. Remove the filler panel mounting screw from the left side of the modular carrier.
2. Pull the left side of the filler panel to the front.
3. Disengage the filler panel tabs from the slots on the right side of the modular carrier and remove the panel.



4. To install a filler panel in the upper position, insert the filler panel tabs in the slots at the top of the modular carrier.
5. Push the left side of the filler panel in until it is seated.
6. Install the mounting screw.



6.6 How to Mount a Storage Device

The modular carrier has multiple mounting holes and two mounting slots. The device form factor (half-height or full height) as well as the specific device determines the mounting holes used. The general configuration rules are:

- A single half-height device is mounted in the top slot.
- A full height device is mounted in the bottom slot.

Complete the following procedure to mount the device in the modular carrier:

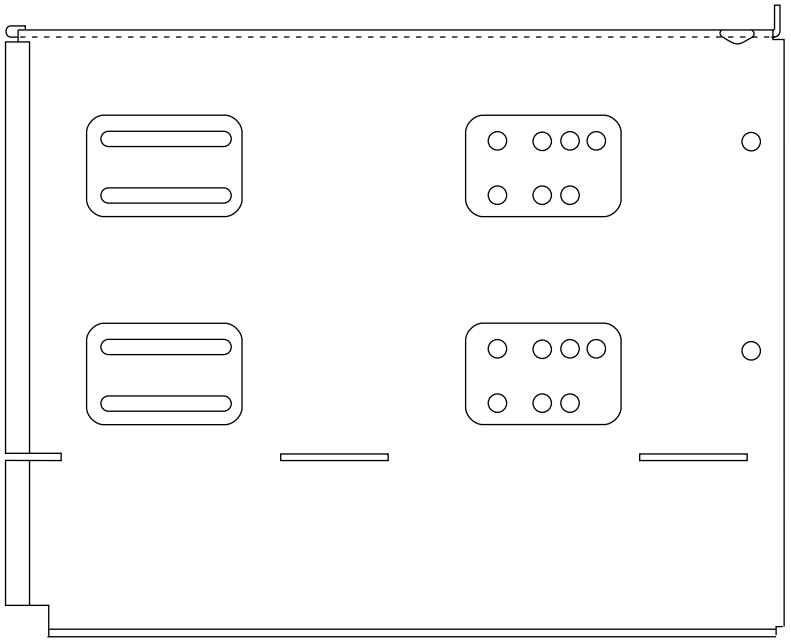
CAUTION

Electrostatic discharge (ESD) can damage storage devices. To prevent this, you must take the following precautions:

- Either place an ESD mat on the work surface before starting the procedures and then place the components on the mat during assembly,
  or
  Wear an ESD wrist strap whenever you handle any of the electronic components (see Section 0).

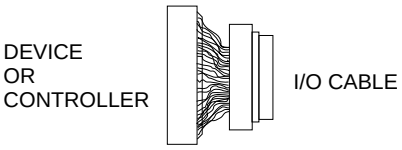
- Do not touch the device connectors.

1. Determine the mounting holes to be used by inserting the device into the carrier from the front and moving it so that the slots in the rear and the mounting holes in the front align with the device mounting holes.
2. Insert the device mounting screws and tighten them.



CXO-4475A-MC

3. Connect a 68-pin to 50-pin adapter cable to the each device 50-pin connector.



CXO-4973A-MC

CAUTION

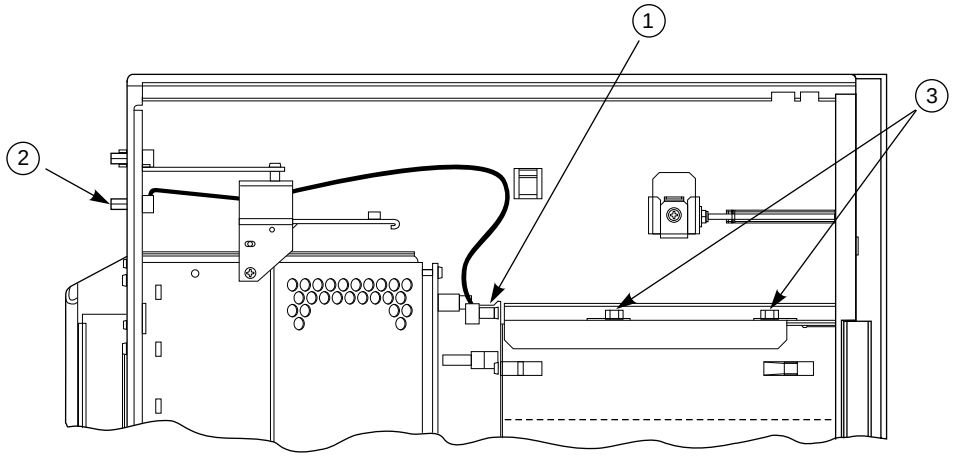
The only *compatible* 68-pin to 50-pin storage device adapter cables are part number 12-04009-02. The similar appearing adapter cable, part number 12-04009-01, *is not storage device compatible* and can be used only with storage controllers.

6.7 How to Install the Modular Carrier

Complete the following procedure to install the modular carrier in the pedestal and to connect the cables:

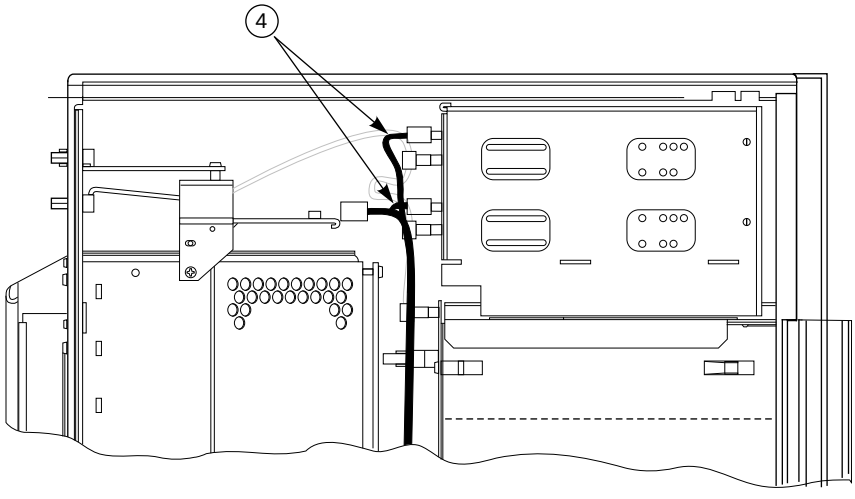
1. Disconnect the 68-conductor I/O cable from the pedestal SCSI bus backplane.
2. On the rear panel, remove the 68-conductor I/O cable connector mounting hardware. Remove the I/O cable.

   NOTE:
   Save the cable and mounting hardware.
3. Remove the two mounting screws from the pedestal.



CXO-4989A-MC

4. Set the modular carrier in the pedestal and connect a 4-pin dc power cable connector to each storage device.

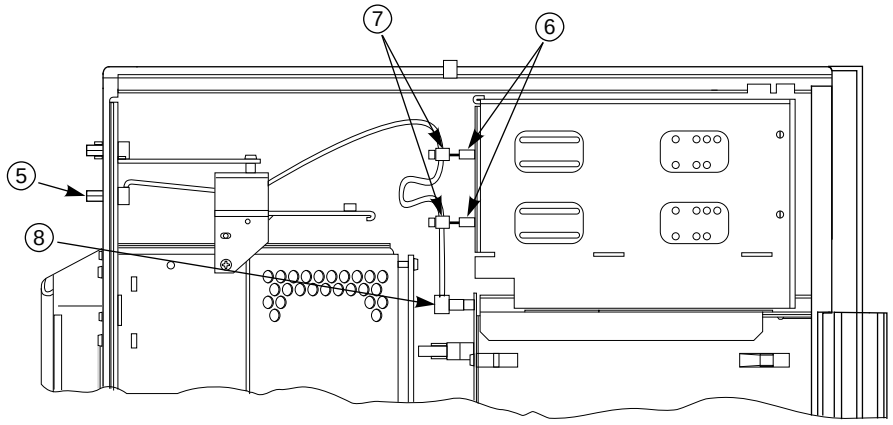


CXO-4990A-MC

CAUTION

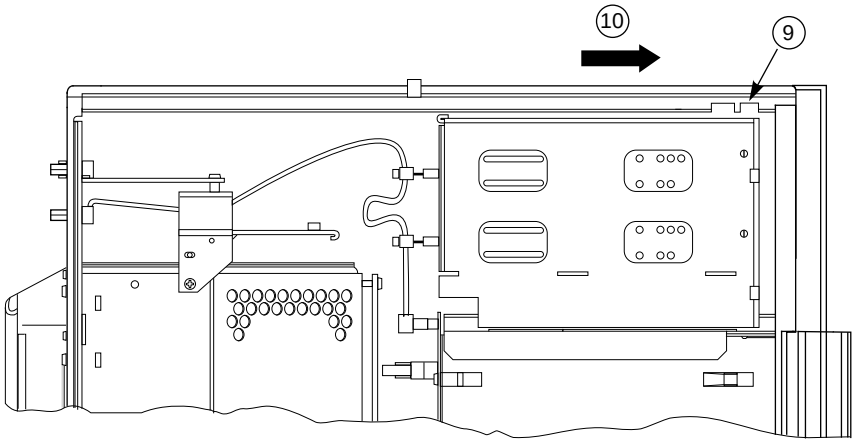
The only *compatible* 68-pin to 50-pin storage device adapter cables are part number 12-04009-02. The similar appearing adapter cable, part number 12-04009-01, *is not storage device compatible* and can be used only with storage controllers.

1. Mount the storage device 68-conductor input cable connector on the rear panel.
2. Connect a storage device adapter cable to each device with a 50-pin output connector.
3. Connect a 68-conductor device input cable connector to each device or each device adapter cable.
4. Connect the device input cable to SCSI bus backplane connector J10.



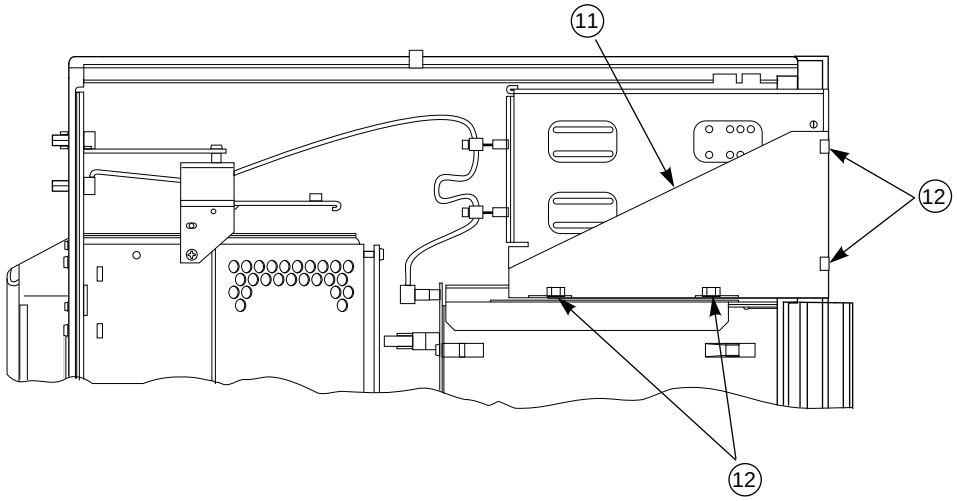
CXO-4991A-MC

5. Align the top front of the modular carrier with the notch in the top edge of the pedestal, slide the carrier into the pedestal and push it against the right side.
6. There are two hooks on the right side of the modular carrier. These hooks fit into slots on the right side of the pedestal. Slide the carrier forward so that the hooks engage the slots in the pedestal. The modular carrier mounting holes must align with the pedestal mounting holes.



CXO-5015A-MC

7. Insert the angle bracket flush against the front of the enclosure. Align the bracket mounting slots with the carrier mounting slots.
8. Install the carrier mounting screws removed in Step 1. Install the front angle bracket mounting screws (refer to Section 6.4).



CXO-4992A-MC

9. Set the pedestal configuration address to a valid, 8-bit device address. The default address for a single bus is **1;** the default address for a dual bus is **0.** See the *HA720W High-Availability Pedestal OEM Product Specification* for other valid, 8-bit device addresses.
10. Test the pedestal for proper operation by completing the procedure in Section 1.5.

THIS COMPLETES THE STORAGE DEVICE OPTION INSTALLATION PROCEDURE.

7

Installing a Storage Controller Option

This chapter describes the procedure for installing a storage controller option in a high-availability pedestal using the 5.25-inch device mounting option.

You can install an SC4200-series storage controller in a high-availability pedestal using the 5.25-inch storage controller option and either the 4 MB read/write (SHZ67) or 16 MB read/write (SHZ66) cache memory option.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. Install the redundant power option (SHGZ4).
3. Install the dual bus option (SH02A).
4. Install the SCSI bus converter option (SHZ36).
5. Install the EMU option (SH02B).
6. Install the 5.25-inch storage device option (SH02C).
7. **Install the storage controller options (SHZ66 or SHZ67).**
8. Install the storage controller dual pedestal option (SH02E).

CAUTION

1. The procedures in this chapter for installing only a storage controller. If you are installing the storage controller dual pedestal option *at the same time*, you will also use *some* of the procedures in Chapter 8.

2. Although it is physically possible to install both a storage controller and 5.25-inch storage device at the same time, it is not considered a *valid* configuration due to the complexity of the internal cabling.

7.1 How to Prepare for the Installation

Installing this option requires completing the following procedures in the specified sequence:

1. Review the procedures in this chapter to become familiar with the installation procedures and the option materials.
2. Read the storage controller publications so that you are familiar with controller and its components. Pay particular attention to the storage controller configuration setup (for example., switches, jumpers, and so forth):
3. Be sure that you have all the option materials listed in Section 7.3.
4. Set the storage controller SCSI bus address as described in the controller product description.
5. Remove the device filler panels from the pedestal and the modular carrier (see Section 7.4).
6. Mount the storage controller in the modular carrier (see Section 7.4).
7. Install the modular carrier in the pedestal (see Section 0).
8. Test the pedestal for proper operation.

7.2 How to Configure the Storage Controller

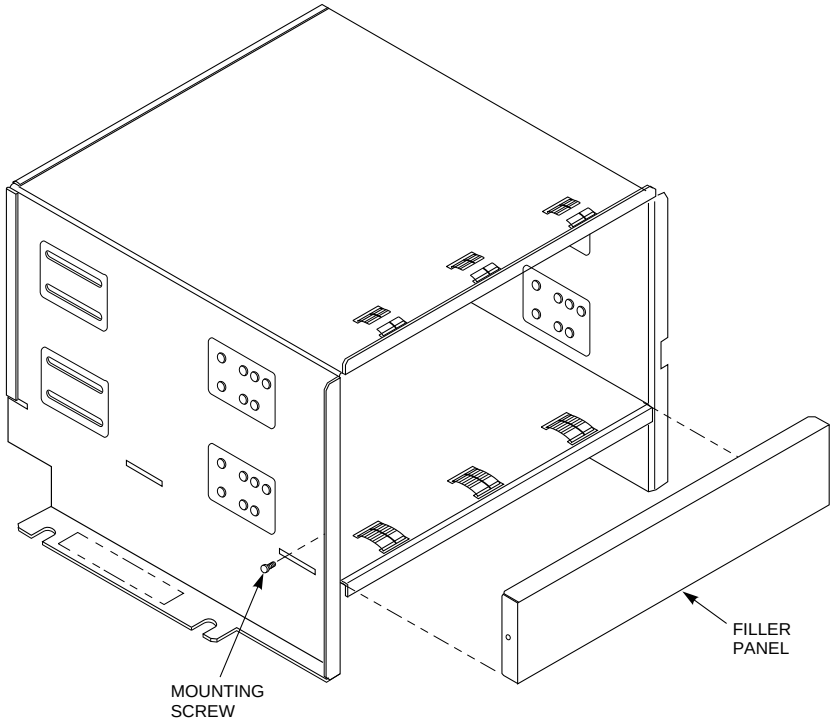
Before you install the storage controller in the modular carrier you must configure it as described in *SC-4000-Series Controllers OEM Product Specification.*

7.3 What You Need to Complete the Installation

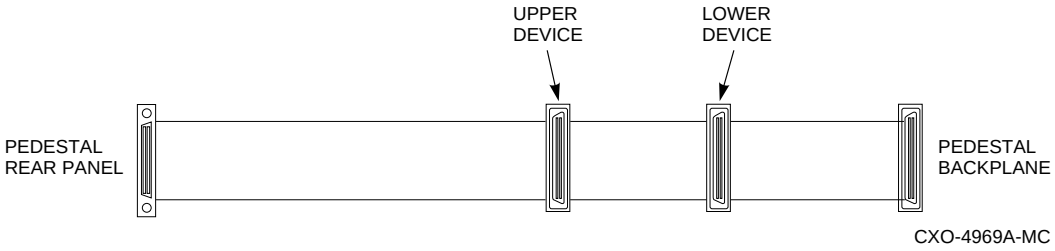
Table 7–1 describes the materials you need to install this option.

Table 7–1 Storage Controller Option Materials

5.25-Inch Device Mounting Option Parts	Qty
Modular carrier with filler panel	1



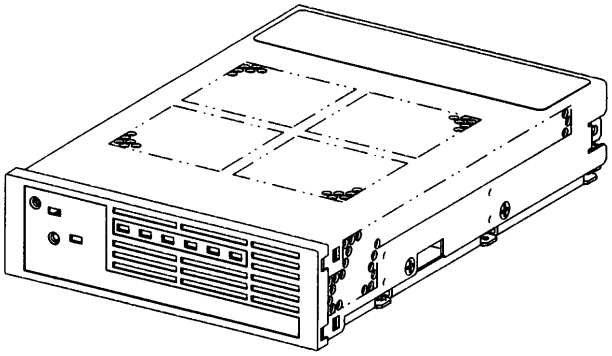
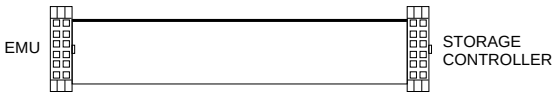
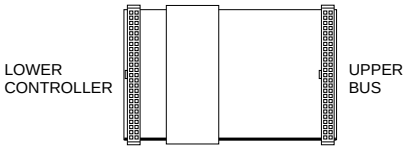
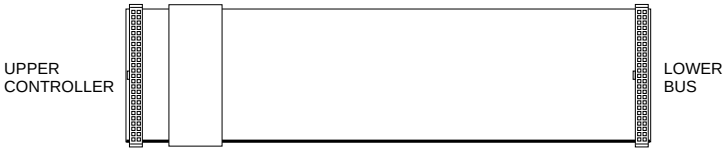
5.25-inch device 68-conductor input cable, 635 mm (25 in) long	1



NOTE

This cable is part of the 5.25-inch device mounting option (SH02B). It is used only to install 5.25-inch storage devices; not storage controllers.

Mounting Hardware	
Screw, 6–32 x 0.187 in	8
Screw, M3 x 5 mm	8

Storage Controller Option Parts	
SC4200 Storage Controller Assembly with 4 MB read/write cache memory (SHZ67) or SC4200 Storage Controller Assembly with 16 MB read/write cache memory (SHZ66) with Memory Cover  CXO-5065A-PH	1
Cable assembly, 12-conductor, 191 mm (7.5 in) long  CXO-4980A-MC	1
Cable assembly, 10-conductor, 381 mm (15 in) long  CXO-4978A-MC	1
Cable assembly, 50-conductor, 127 mm (5.0 in) long  CXO-4981A-MC	1
Cable assembly, 50-conductor, 305 mm (12.0 in) long  CXO-4979A-MC	1
Mounting Hardware	
Screw, 6–32 x 0.250 in	1
User Supplied Materials	
Electrostatic Discharge (ESD) protection	A/R
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	
SC–4000-Series Controllers OEM Product Specification,	

7.4 How to Remove the Pedestal Filler Panel

NOTE

There are two device filler panels: one is in the pedestal, and one is in the modular carrier. The pedestal panel is always removed. You remove the modular carrier device filler panel when installing either a full-height device or a half-height device in the lower position. When installing a single, half-height device, install the filler panel in the unused location to control the air flow in the pedestal.

NOTE

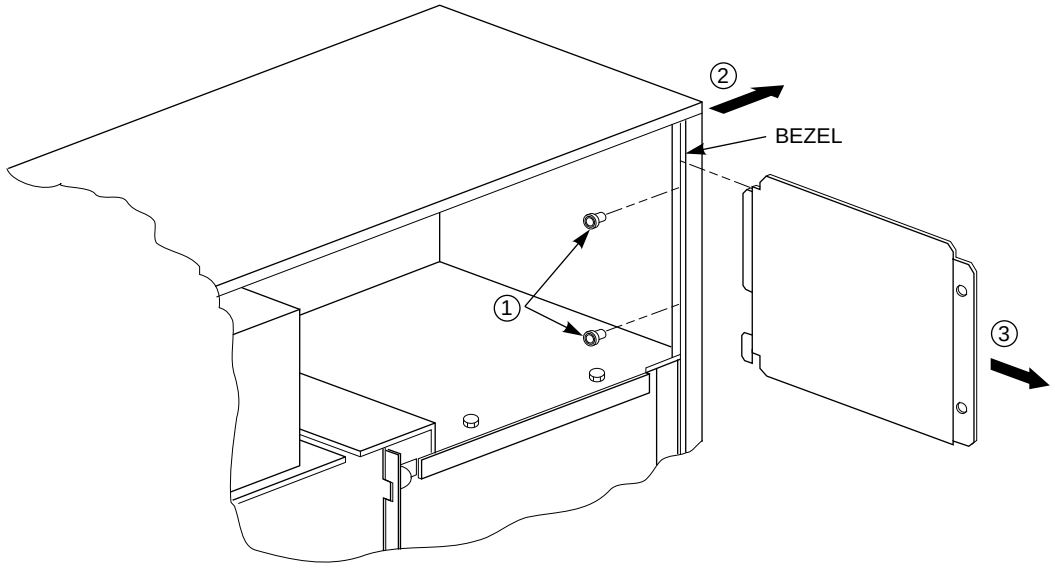
Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

After you turn off the power, disconnect the SCSI cables and remove the side cover as described in Section 1.4, complete the following procedure to remove the filler panels:

1. Remove the two mounting screws that secure the bezel.

   NOTE
   These screws are used to mount the angle bracket (see Section 7.7).

2. Gently push the bezel forward.
3. Pull out the filler panel.



CXO-5013A-MC

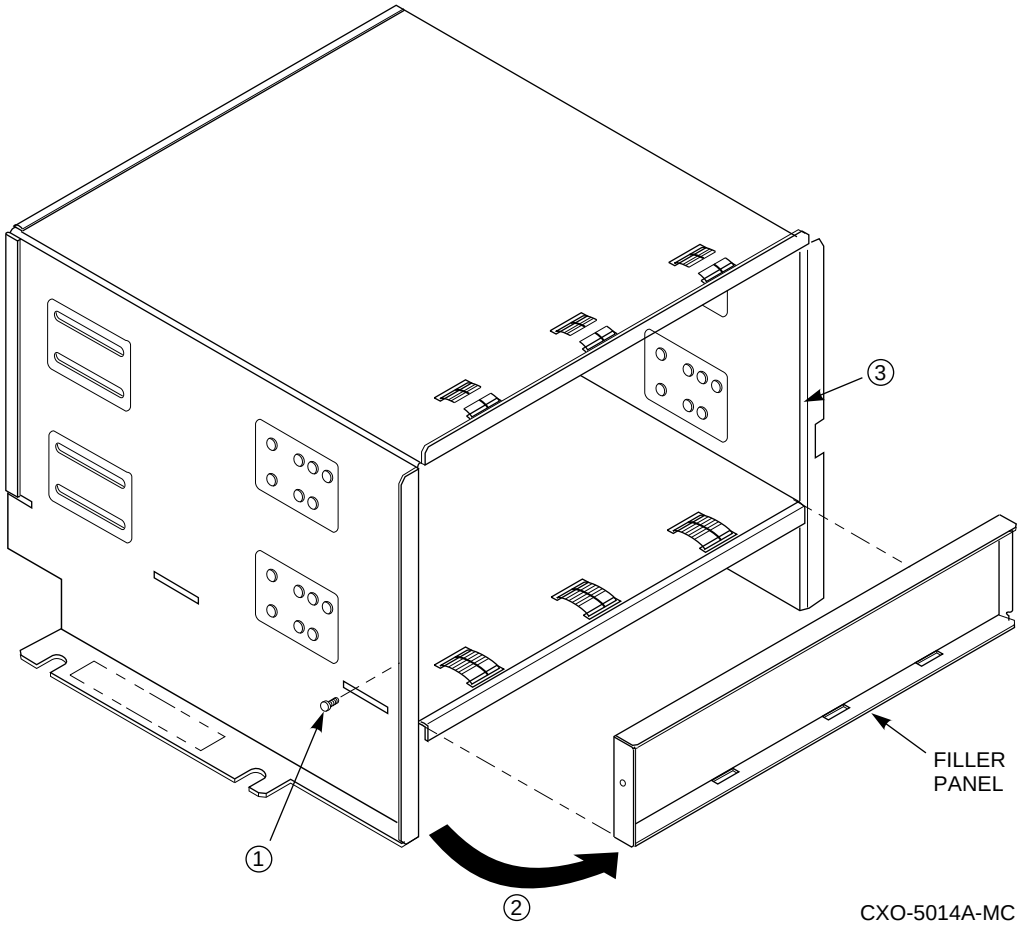
7.5 How to Remove the Modular Carrier Filler Panel

The modular carrier device filler panel is factory installed. When you install either a full-height device or a half-height device in the lower position, you must remove the panel by completing the following procedure:

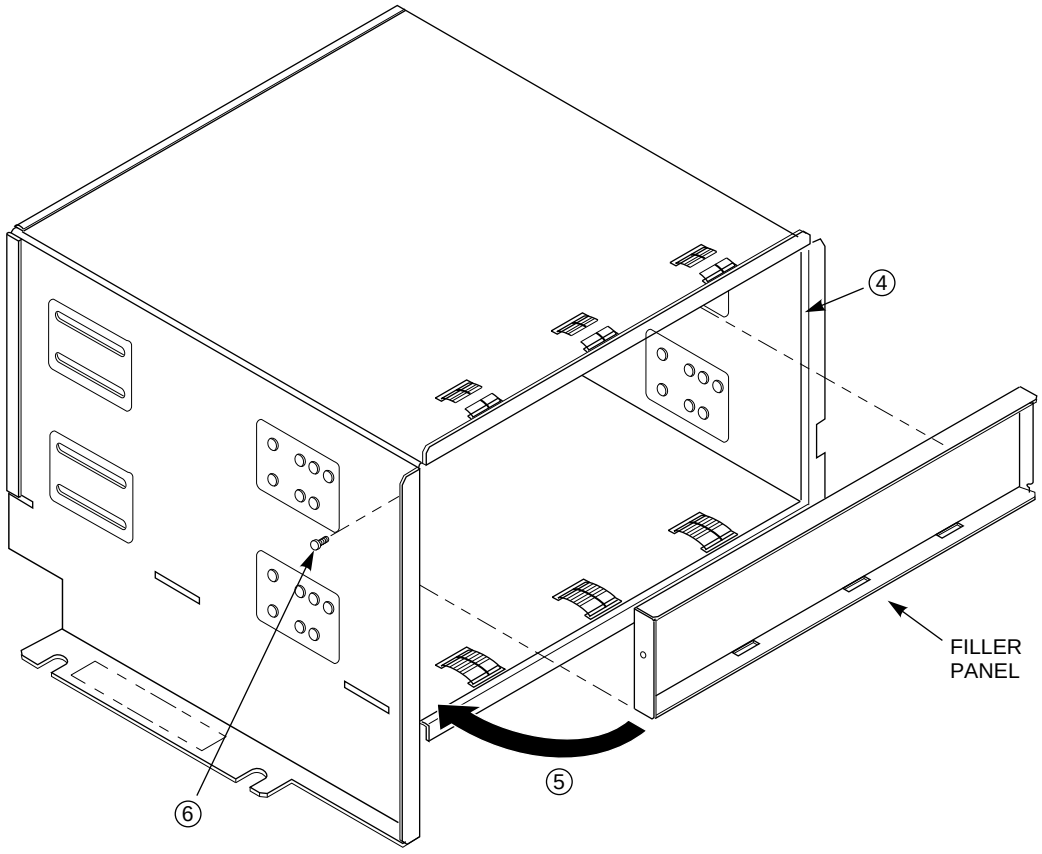
CAUTION

When you install a single half-height device, you must install the modular carrier device filler panel in the unused position to maintain air flow through the device and the power supply.

1. Remove the filler panel mounting screw from the left side of the modular carrier.
2. Pull the left side of the filler panel to the front.
3. Disengage the filler panel tabs from the slots on the right side of the modular carrier and remove the panel.



4. Insert the filler panel tabs in the slots at the top of the modular carrier.
5. Push the left side of the filler panel in until it is seated.
6. Install the mounting screw.



7.6 How to Mount the Storage Controller

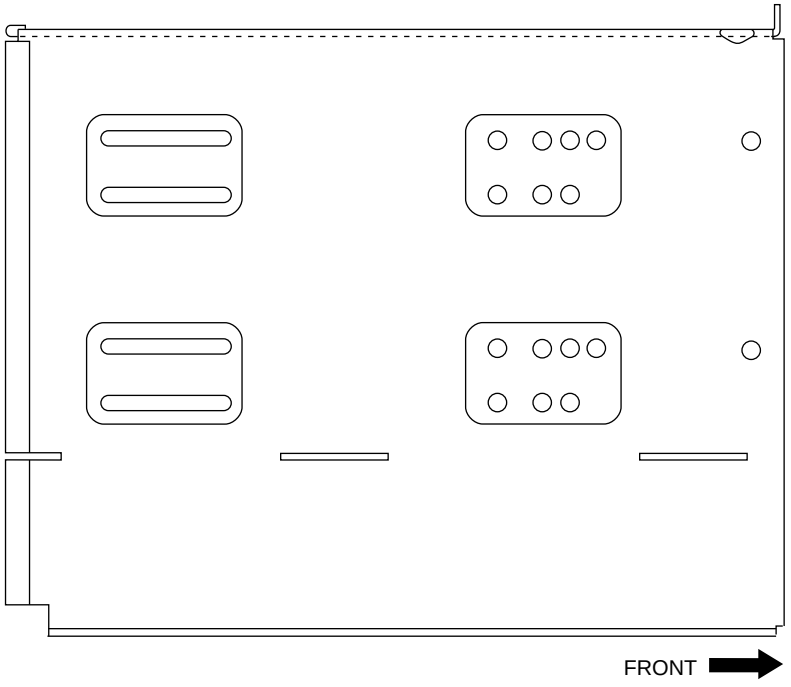
The storage controller is always mounted in the lower position in the modular carrier. Complete the following procedure to mount the device in the modular carrier:

CAUTION

Electrostatic discharge (ESD) can damage storage devices. To prevent this, you must take the following precautions:

- Either place an ESD mat on the work surface before starting the procedures and then place the components on the mat during assembly,
  or
  Wear an ESD wrist strap whenever you handle any of the electronic components (see Section 1.7).
- Do not touch the device connectors.

1. Insert the controller in the modular carrier lower position. Align the slots in the rear and the mounting holes in the front with the controller mounting holes.
2. Insert the device mounting screws and tighten them.



CXO-4475A-MC

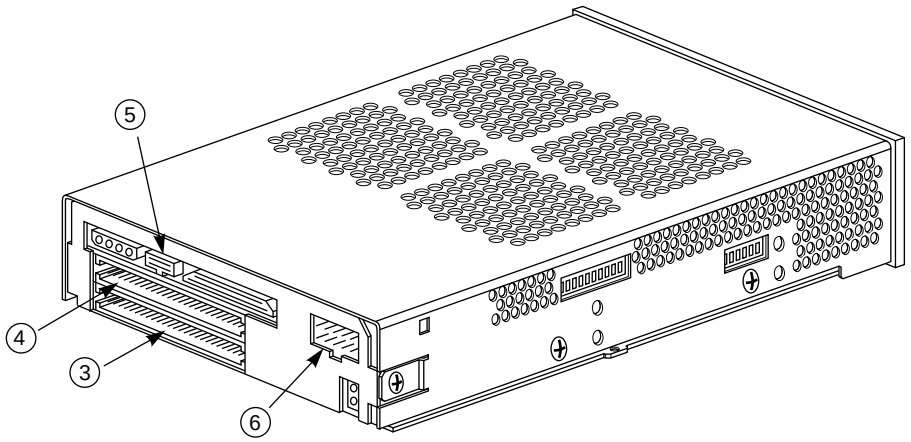
CAUTION

The only storage controller *compatible* 68-pin to 50-pin storage device adapter cable is part number 12-04009-**01**. The similar appearing adapter cable, part number 12-04009-02, *is not* storage controller compatible and can be used only with storage devices.

3. Connect the 127 mm (5 in) 50-conductor cable to the lower device port.
4. When you are using the dual bus configuration, connect the 305 mm (12 in) 50-conductor cable to the upper device port.

   OR, *if you are installing the dual pedestal option—*

   Connect a 68-pin to 50-pin adapter cable to the upper device port connector. Connect the 457 mm (18 in) 68-conductor output cable to upper device port storage controller adapter cable.
5. Connect the EMU cable to the controller.
6. Connect the maintenance terminal cable to the controller.

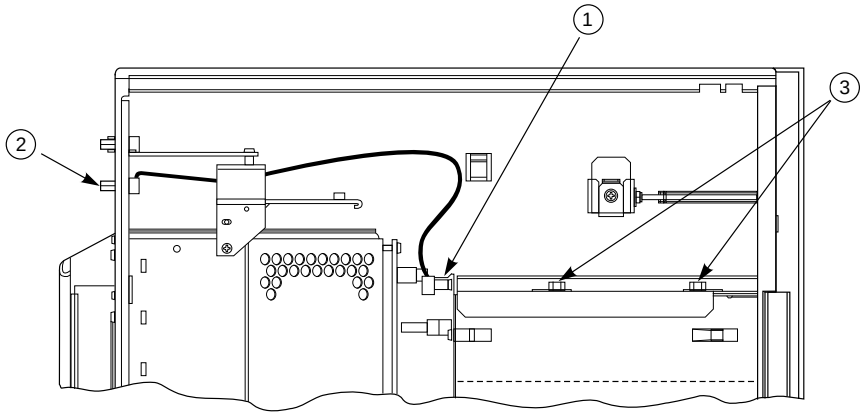


CXO-5051A-MC

7.7 How to Install the Storage Controller

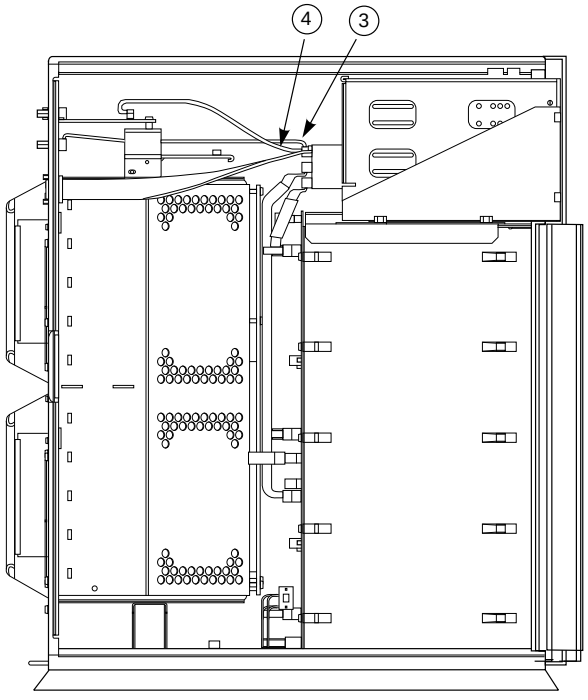
Complete the following procedure to install the storage controller modular carrier in the pedestal:

1. Remove the two mounting screws from the pedestal.
2. Disconnect the 68-conductor I/O cable from the pedestal SCSI bus backplane.



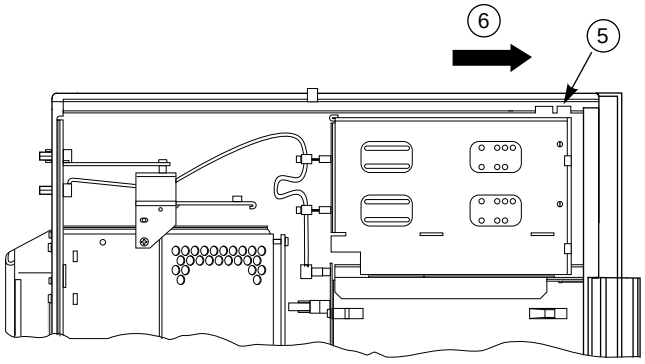
CXO-4989A-MC

3. Set the modular carrier in the pedestal and connect the 4-pin dc power cable connectors to the storage controller.
4. Connect the I/O cable to the controller.



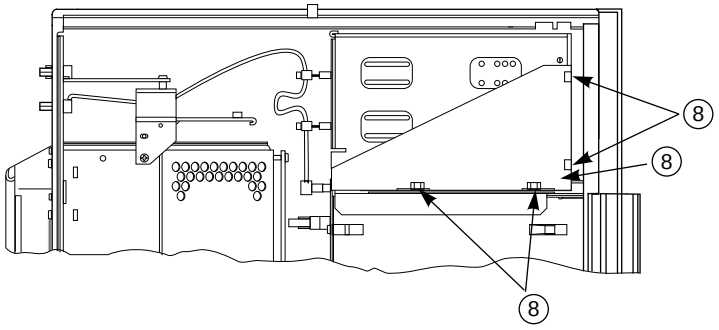
CXO-5053A-MC

5. Align the top front of the modular carrier with the notch in the top edge of the pedestal and slide the carrier into the pedestal and push it against the right side.
6. There are two hooks on the right side of the modular carrier. These hooks fit into slots on the right side of the pedestal. Slide the carrier forward so that the hooks engage the slots in the pedestal. The modular carrier mounting holes must align with the pedestal mounting holes.



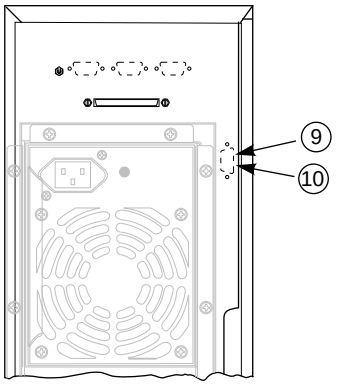
CXO-5054A-MC

7. Insert the angle bracket flush against the front of the enclosure. Align the bracket mounting slots with the carrier mounting slots.
8. Install the carrier mounting screws removed in Step 1. Install the front angle bracket mounting screws (refer to Section 7.4).



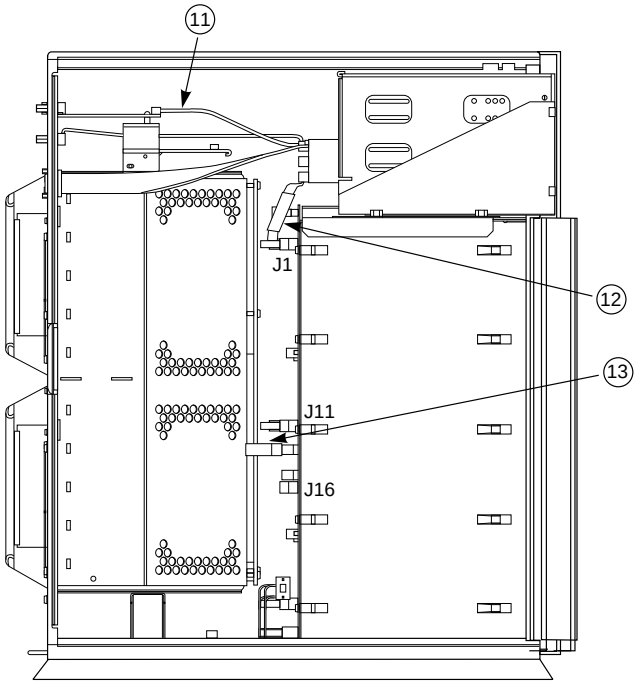
CXO-5055A-MC

9. Remove the maintenance terminal “knockout” panel from the rear panel.
10. Mount the 9-pin sub-miniature D connector on the rear panel.



CXO-5056A-MC

11. Connect the EMU cable to the EMU.
12. Connect the controller lower device cable to SCSI bus backplane connector J1.
13. Connect the jumper cable between SCSI bus backplane connectors J11 and J16.



CXO-5057A-MC

14. Complete the installation as described in Chapter 1, “Installing the Pedestal Options.”
15. Test the pedestal for proper operation by completing the procedure in Section 1.5.

THIS COMPLETES THE STORAGE CONTROLLER OPTION INSTALLATION PROCEDURE.

8

Installing the Dual Pedestal Option

This chapter describes the procedure for installing the storage controller dual pedestal option, after installing a storage controller option.

You can install this option as the same time you install a storage controller option or afterwards. The procedures in this chapter.

CAUTION

The procedures in this chapter describe how to install a storage controller dual pedestal option in a pedestal with a storage controller. Chapter 7 describes the procedures for installing a storage controller.

You can install options in any sequence. However, to simplify the process and thereby reduce the time required, Digital recommends that when you are installing *multiple options* at the same time, you install them in the following sequence:

1. Install the pedestal base (SH02D).
2. Install the redundant power option (SHGZ4).
3. Install the dual bus option (SH02A).
4. Install the SCSI bus converter option (SHZ36).
5. Install the EMU option (SH02B).
6. Install the 5.25-inch storage device option (SH02C).
7. Install the storage controller options (SHZ66 or SHZ67).
8. **Install the storage controller dual pedestal option (SH02E).**

8.1 How to Prepare for the Installation

Installing this option requires completing the following procedures in the specified sequence:

1. Review the procedures in this chapter to become familiar with the installation procedures and the option materials.
2. Be sure that you have all the option materials listed in Section 5.

Caution

Electrostatic discharge (ESD) can damage storage controllers. To prevent this you must take the following precautions:

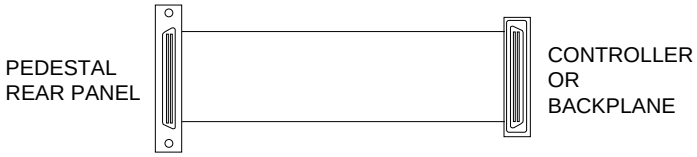
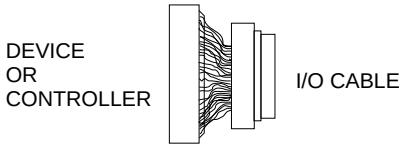
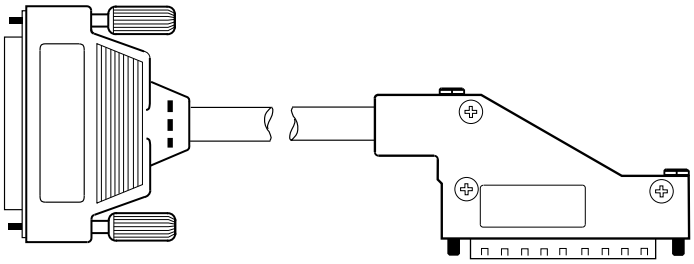
- Either place an ESD mat on the work surface before starting the procedures and then place the components on the mat during assembly.
  or
  Wear an ESD wrist strap whenever you handle any of the electronic components (see Section 0).
- Do not touch the controller connectors.

3. Configure the controller pedestal SCSI bus as a single bus.
4. Install the dual pedestal cables and the modular carrier in the pedestal (see Section 8.3)
5. Test the pedestal for proper operation.

8.2 What You Need to Complete the Installation

Table 8–1 describes the materials you need to install this option.

Table 8–1 Storage Controller Dual Pedestal Option Materials

Storage Controller Dual Pedestal Option Parts	Qty
Cable assembly, 68-conductor, 457 mm (18 in) long  CXO-4970A-MC	1
Storage controller adapter cable, 68-pin female to 50-pin female (part number 12-04009-**01**)  CXO-4973A-MC	2
External SCSI bus cable, 1m (3.3 ft) long (BN21K–01)  CXO-4171A-MC_R	1
User Supplied Materials	
Electrostatic Discharge (ESD) protection	A/R
Common hand tools	A/R
HA720W High-Availability Pedestal OEM Product Specification	
SC–4000-Series Controllers OEM Product Specification	

8.3 How to Install the Dual Pedestal Option—Part I

NOTE

Each installation process is numbered. For clarity, the associated illustrations use the same numbers to identify component locations and the installation sequence.

After you turn off the power, disconnect the SCSI cables, and remove the side cover as described in Section 1.4, complete the following procedure to connect the cables to the controller:

NOTE

The dc power cable, EMU–controller cables, and the maintenance terminal cable are already installed. Disconnecting the maintenance terminal cable can facilitate connecting other cables to the controller.

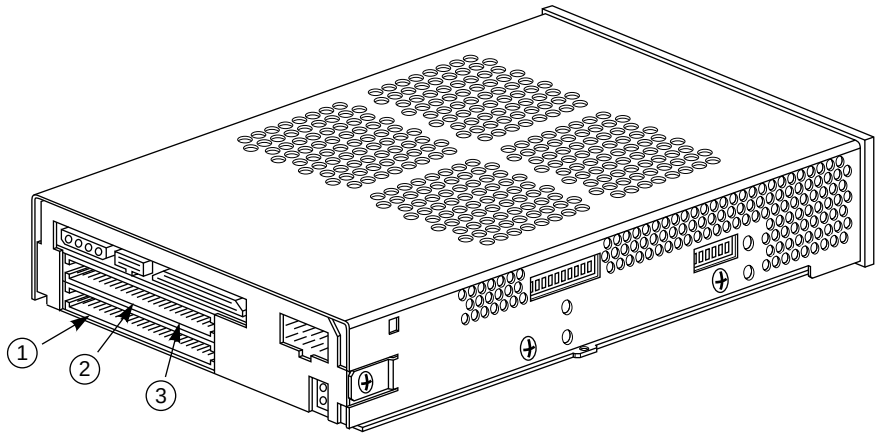
1. If the pedestal SCSI bus backplane is configure as a single bus, GO TO STEP 2.

   Remove the 50-conductor cable between the controller upper device port and SCSI bus backplane connector J5.

2. Connect a 68-pin to 50-pin adapter cable to the upper device port connector.

   CAUTION

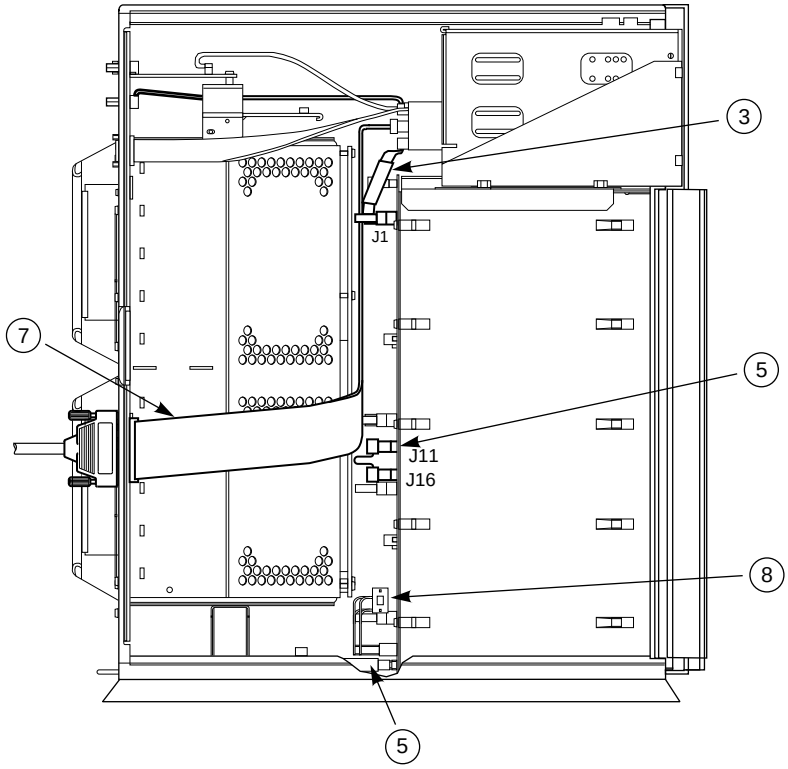
   The only storage controller *compatible* 68-pin to 50-pin storage device adapter cable is part number 12-04009-01. The similar appearing adapter cable, part number 12-04009-02, is not storage controller compatible and can be used only with storage devices.



CXO-5058A-MC

3. Connect the 457 mm (18 in) 68-conductor output cable to upper device port storage controller adapter cable.
4. Connect a jumper cable between pedestal backplane connectors J11 and J16.
5. Install a SCSI bus terminator on connector J17.
6. Install the 457 mm (18 in) I/O cable connector on the rear panel.

   Connect the I/O cable to the controller adapter cable on the upper device connector.
7. Set the pedestal configuration switch to the single bus configuration address **1**.

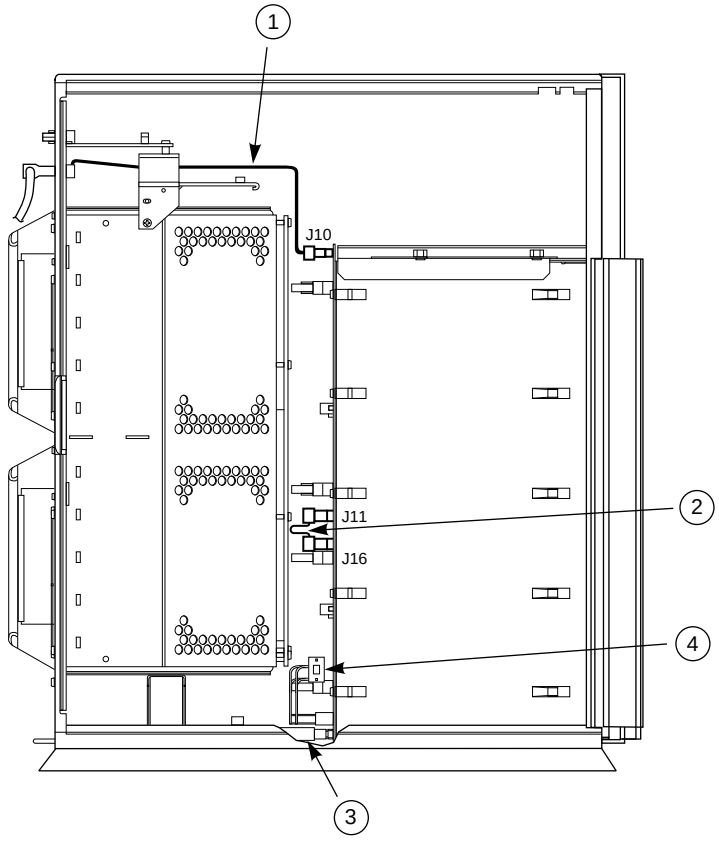


8. Replace the side cover (see Section 1.5).

8.4 How to Install the Dual Pedestal Option—Part II

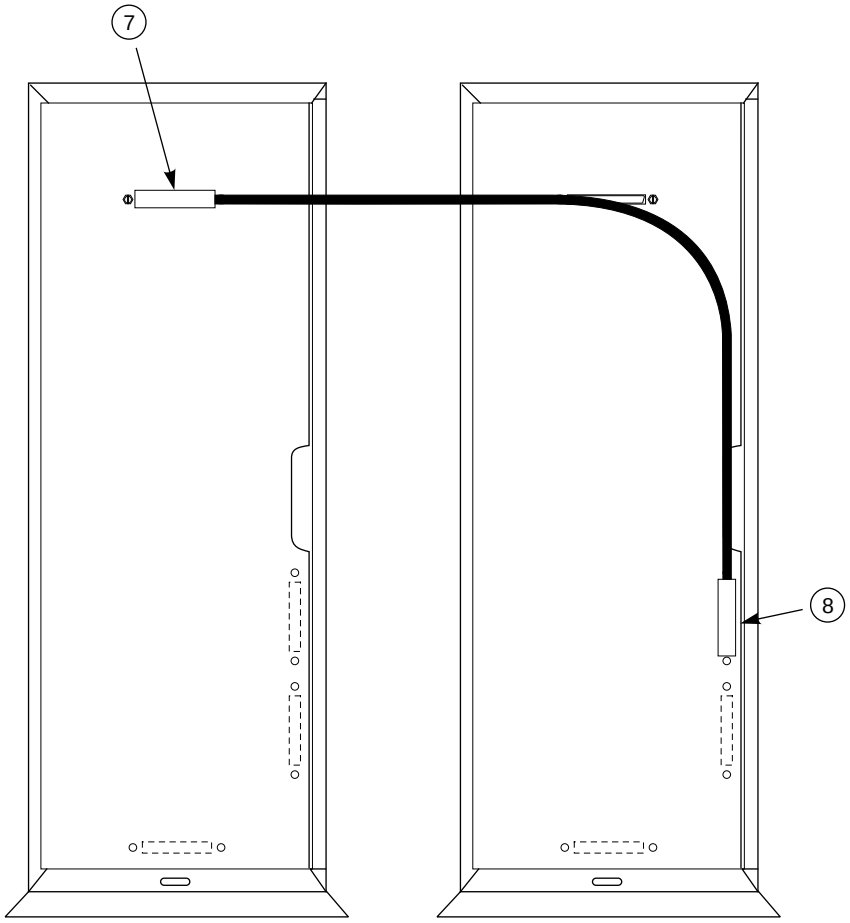
Complete the following procedure to configure the *expansion pedestal* for a dual pedestal operation:

1. Route a storage controller host input cable from the rear panel to connector J10.
2. Connect a jumper cable between pedestal backplane connectors J11 and J16.
3. Install a SCSI bus terminator on connector J17.
4. Set the pedestal configuration switch to the single bus configuration address **1**.



CXO-5060A-MC

5. Replace the side cover (see Section 1.5).
6. Position the pedestals as shown.
7. Connect the 1 m (3.3 ft) SCSI cable to the expansion pedestal.
8. Connect the 1 m (3.3 ft) SCSI cable to the controller pedestal.



9. Test the pedestal for proper operation by completing the procedure in Section 1.5.