StorageWorks™ Solutions

BA35X–VA Vertical Mounting Kit
Users Guide

Order Number EK–350SV–UG. B01

This guide describes the procedures for assembling pedestal kits to create either an 8-bit or a 16-bit deskside expansion pedestals. This guide also includes the procedures for installing and operating the pedestal, and selecting and connecting the SCSI bus cables.

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Preface

The *StorageWorks BA35X–VA Vertical Mounting Kit Users Guide* describes the BA35X–VA pedestal kit and the compatible StorageWorks building block (SBB) shelves. The combination of this kit and SBB shelves is used to create deskside expansion pedestals. This guide is a general introduction to the StorageWorks pedestals. The information in this document supplements, but does not replace, the detailed information contained in the SBB shelf users guides.

Intended Audience

This document is for use by personnel responsible for designing, configuring, assembling, installing, and operating pedestals.

Structure

This guide is organized as follows:

Chapter 1	An introduction to the StorageWorks pedestals with general descriptions, specifications. capabilities, and so forth.
Chapter 2	Procedures for assembling a pedestal using a kit and a user supplied SBB shelf.
Chapter 3	General instructions for planning and completing an installation
Chapter 4	A description of how to determine the operational status of a pedestal and basic replacement procedures.

Related Documents

The following is a list of other StorageWorks user documents that are applicable to pedestals.

Document Title	Order Number
StorageWorks Solutions BA350-K Series 8-Bit Deskside Pedestal Users Guide	EK–350-KF–UG
StorageWorks Solutions BA356 16-Bit Shelf and SBB Users Guide	EK–BA356–UG
StorageWorks Solutions BA356-K Series 16-Bit Deskside Pedestal Users Guide	EK–356KB–UG
StorageWorks Solutions Configuration Guide	EK–BA350–CG
StorageWorks Solutions Shelf and SBB Users Guide (8-bit)	EK–BA350–UG

Documentation Conventions

The following conventions are used in this guide:

boldface type Boldface type indicates the first instance of terms being defined in the text, the glossary, or both.

italic type Italic type indicates emphasis and complete guide titles. In the glossary, italic type also is used to indicate cross-references.

1

Introducing the StorageWorks Pedestals

This chapter describes the **StorageWorks**™ BA35X–VA **vertical mounting kit** (pedestal kit). With this kit and an **SBB shelf** you can create either an 8-bit (BA350 series) or a 16-bit (BA356 series) series **deskside expansion pedestal** (pedestal). This description includes features, specifications, and compatibility with other StorageWorks products, and **small computer system interface** (**SCSI**) **controllers.**

> **Note**
>
> In this guide, the term "pedestal kit" refers to the BA35X–VA vertical mounting kit. The term "pedestal" refers to both the 8-bit and 16-bit deskside expansion pedestals.

Figure 1–1 Typical Deskside Expansion Pedestal
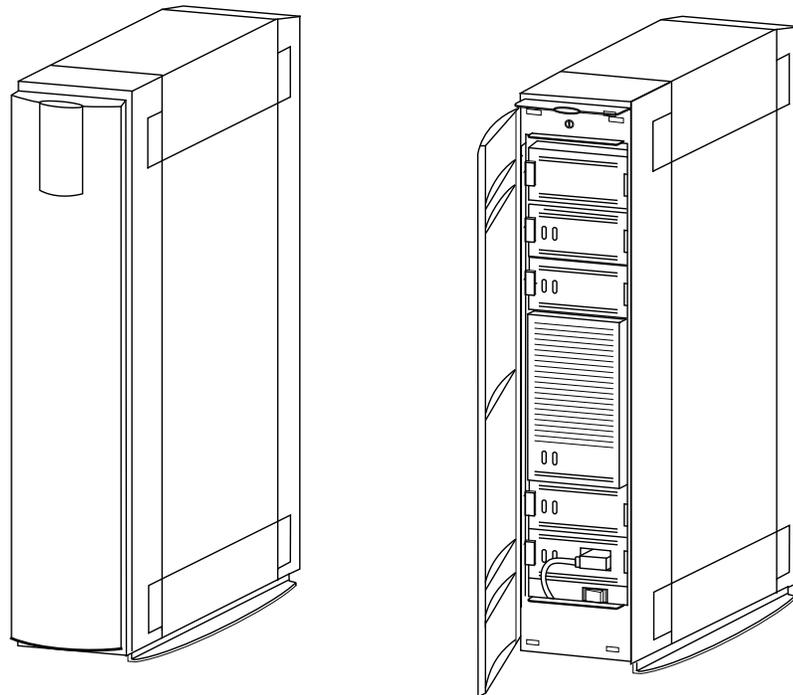
CXO-4371A-MC

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     Trademark of Digital Equipment Corporation.

1.1 Product Description

The pedestal kit encloses individual **StorageWorks building block shelves** (**SBB shelves**) to create pedestals similar to the one shown in Figure 1–1.

This low-cost, mass storage solution enables you to design and configure an extremely flexible storage array to meet both your current and future needs. The basic component of the deskside expansion pedestal is an SBB shelf—either an 8-bit, **single-ended SCSI bus** shelf (Figure 1–2), or a 16-bit, single-ended SCSI bus shelf (see Figure 1–3).

Figure 1–2 Typical 8-Bit SBB Shelf   **Figure 1–3 Typical 16-Bit SBB Shelf**
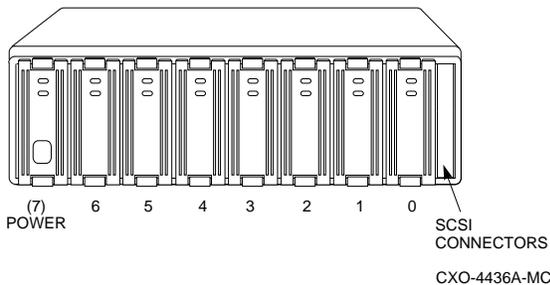
CXO-4436A-MC

CXO-4319A-MC
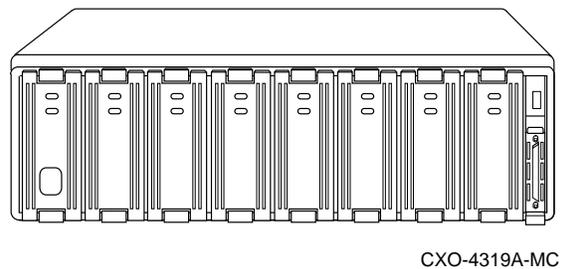
These shelves can accommodate either 3.5-inch or 5.25-inch StorageWorks building blocks (**SBB**s) in various combinations to create a storage array specifically suited to your needs. The SCSI bus controller capabilities can restrict the number of SBBs, the SBB types, and the combination SBB types you install.

You have the option of using any of the StorageWorks compatible disk drives, tape drives, CD-ROMs, or other storage devices mounted in an SBB.

The shelf used determines the following:

- SCSI bus width (8-bit or 16-bit)
- Possible SCSI bus configurations
- Maximum SCSI cable lengths
- Device address range

Note

You can use the DWZZA- (8-bit) or DWZZB-series (16-bit) SCSI bus converter to connect a SCSI controller differential bus to a shelf single-ended bus.

Both the 8-bit and 16-bit shelves have FCC Class B certification. The SBB FCC certification therefore determines the pedestal location . You can use an SBB with FCC Class B certification in a home environment. Use SBBs with FCC Class A certification in a commercial environment.

CAUTION

There is no provision for installing a BA350–M series **controller shelf** in a BA35X–VA pedestal kit to create a deskside expansion pedestal. Digital neither support nor recommends such a configuration.

1.2 Features

All StorageWorks pedestals have the following features:

- Locking front and rear bezels that prevent removal SBBs
- Flexibility to design a **storage array subsystem** that meets your specific needs

- Low-cost SCSI device storage subsystems
- An ac distribution unit with switch-controlled ac outputs
- Capability of "daisy-chaining" the ac input power to multiple pedestals

The shelves and SBBs used in these pedestals have the following features:

- Capability to mix 3.5-inch and 5.25-inch form-factor storage devices in a single pedestal
- **Redundant power** option
- Optional **battery backup unit (BBU)**
- Redundant blower assemblies

- Visual shelf status (power, cooling) indicators
- Visual storage device status (operation, fault) indicators
- Easily removed and installed storage devices

1.3 Pedestal Components

Table 1–1 lists the pedestal components and their source. The pedestal kit includes the enclosure plastics, the **ac distribution unit** with two shelf power cords and a power cord for "**daisy-chaining**" multiple pedestals. It does not include the shelves, storage devices, the shelf SBB power supplies, or the country-specific power cord. You can order these items through your Digital account representative.

Table 1–1 Pedestal Components

Description	Qty	Comment
Pedestal Kit Components		
AC distribution unit	1	
Base	1	Has holes for mounting feet
Bezel clips	8	
Bezel with a door, lock, and key	2	Front and Rear Bezels are identical
Feet	2	Interchangeable
Top	1	
User Supplied Components		
AC input power cord	1	See Table 1–3
Battery backup unit	Optional	
SBB shelf	1	
SCSI cables	A/R	
Shelf ac power supply	1	
Storage SBBs	A/R	

1.3.1 StorageWorks Shelves

Table 1–2 compares the basic features of the 8-bit (BA350) and the 16-bit (BA356) shelves.

Table 1–2 Shelf Features

Feature	8-Bit Shelf	16-Bit Shelf
8-Bit, Single Ended SCSI Bus	YES	YES
16-Bit, Single Ended SCSI Bus	No	YES
Device Addresses		
0–7	YES	YES
8–14	No	YES
SCSI Cable Connections		
50-pin, high-density	Backplane	None
68-pin, high-density	None	16-bit Personality Module
SCSI Bus Adapters		
	DWZZA–VA (Slot 0)	DWZZB–VB (Slot 0)
SCSI Bus Configurations		
Single Bus	YES	YES
Split-bus	YES	YES
SCSI Bus Configuration Control		
	Backplane (Terminator Board and Jumper Board)	Personality Module
Storage Devices		
3.5-inch	YES	YES
5.25-inch	YES	YES
5.25-inch tape drive with loader	No	No
SBB Power Supplies		
ac input	YES —Primary–Slot 7 Redundant–Slot 6	YES—Primary–Slot 7 Redundant–Slot 6
Battery Backup Unit (BBU)	YES—Slot 6	YES—Slot 6
dc input	No	No
Blower Assemblies		
Single speed	YES	No
Dual speed	YES	YES

1.3.2 StorageWorks Building Blocks (SBBs)

The primary factors in determining compatible storage devices are as follow:

1. The SCSI controller must support all the SBBs.

2. The SCSI controller must support all the combinations of devices on the same SCSI bus.

3. You cannot install tape storage devices with a loader (for example, the TLZ6L–VA cartridge tape drive) in a pedestal.

Mounting a storage device in a **modular carrier** creates an SBB. These carriers are available in two form-factors—3.5-inch (see Figure 1–4) and 5.25-inch (see Figure 1–5). All power supplies and battery backup units are 3.5-inch SBBs.

Review the *StorageWorks Solutions Configuration Guide* to determine the available SBBs. Remember:

- You cannot install tape drives with loaders

- Your SCSI controller must support the devices

Figure 1–4 Typical 3.5-Inch SBB   **Figure 1–5 Typical 5.25-Inch SBB**
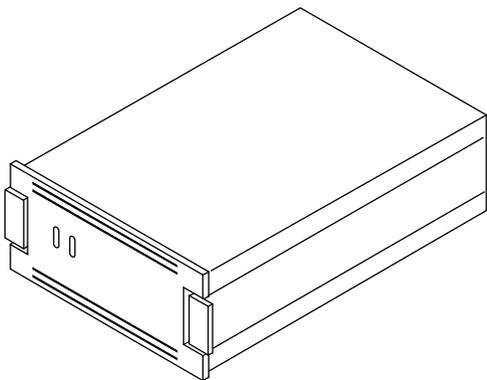
CXO-4379A-MC
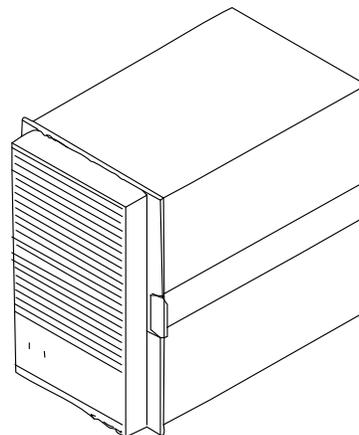
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CAUTION

The SCSI controller capability determines the procedure for removing and replacing ("swapping") and SBB. Check your SCSI controller documentation to determine the procedures supported.

Unless the controller supports removing or installing an SBB while the SCSI bus is active, a **hot swap,** you may corrupt or lose the data.

Digital controllers, such as the HSJ-series, have switches for deactivating (quiescing) individual buses. Quiescing the bus without turning the SBB shelf power off and replace an SBB is a **warm swap**.

1.4 Power

AC power passes through the ac distribution unit to the shelf power supply SBB. The ac distribution unit has the following features:

- Universal ac input (100–240 V ac, 50–60 Hz)
- Switch controlled ac outputs
  - Two 2.0 amp shelf power cords (Figure 1–6)
  - One 4.0 amp power cord for second pedestal (see Figure 1–7)
- User-selected, country-specific power cords (see Table 1–3)

Note

The pedestal kit does not contain any external power cords.

For proper operation of a pedestal, you must have either one of the recommended country-specific power cords listed in Table 1–3 or an equivalent.

Table 1–3 Recommended Country-Specific AC Power Cords

Country	Voltage	Amps	Connector Type	Plug Type	Length M	Length Ft	Order No.
Australia	250 V ac	10 A	IEC 320 C13, C14	AS3112–1981	2.5	8.2	BN19H–2E
Central Europe	250 V ac	10 A	IEC 320 C13, C14	CEE 7/7 (Schuko)	2.5	8.2	BN19C–2E
Denmark	250 V ac	10 A	IEC 320 C13, C14	Afsnit 107	2.5	8.2	BN19K–2E
India	250 V ac	10 A	IEC 320 C13, C14	BS 546	2.5	8.2	BN19S–2E
Ireland	250 V ac	10 A	IEC 320 C13, C14	BS 1363	2.5	8.2	BN19A–2E
Israel	250 V ac	10 A	IEC 320 C13, C14	SI 32	2.5	8.2	BN18L–2E
Italy	250 V ac	10 A	IEC 320 C13, C14	CEI 213–16/VII	2.5	8.2	BN19M–2E
Japan	125 V ac	15 A	IEC 320 C13, C14	NEMA 5–15	3.0	9.8	BN27S–03
New Zealand	250 V ac	10 A	IEC 320 C13, C14	AS3112–1981	2.5	8.2	BN19H–2E
South Africa	250 V ac	10 A	IEC 320 C13, C14	BS 546	2.5	8.2	BN19S–2E
Switzerland	250 V ac	10 A	IEC 320 C13, C14	SEV 1011	2.5	8.2	E0–BN19H–2E
United Kingdom	250 V ac	10 A	IEC 320 C13, C14	BS 3163	2.5	8.2	BN19A–2E
United States	125 V ac	15 A	IEC 320 C13, C14	NEMA 5–15	3.0	9.8	BN27S–03

Figure 1–6 Power Distribution Unit—Front View

POWER
SWITCH
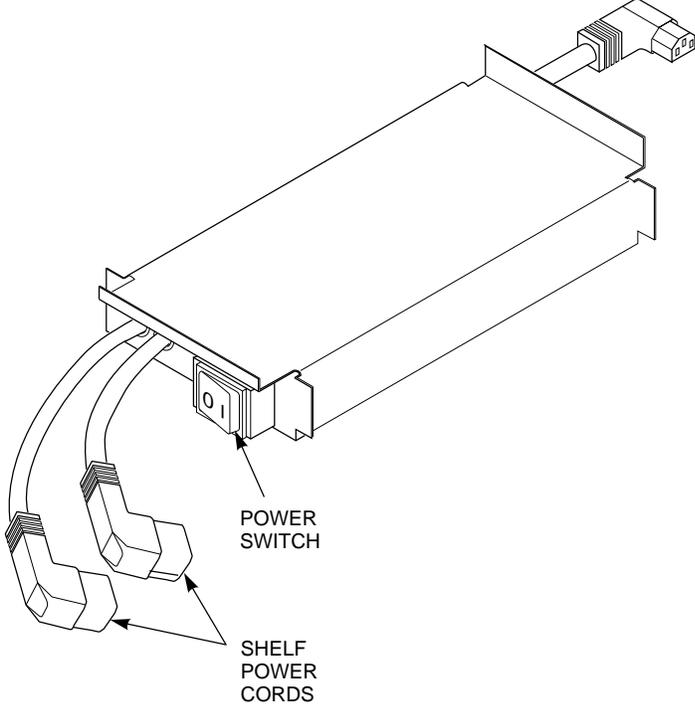
SHELF
POWER
CORDS

CXO-4417A-MC

Figure 1–7 Power Distribution Unit—Rear View

AC INPUT
RECEPTACLE

SECOND
UNIT POWER
CORD
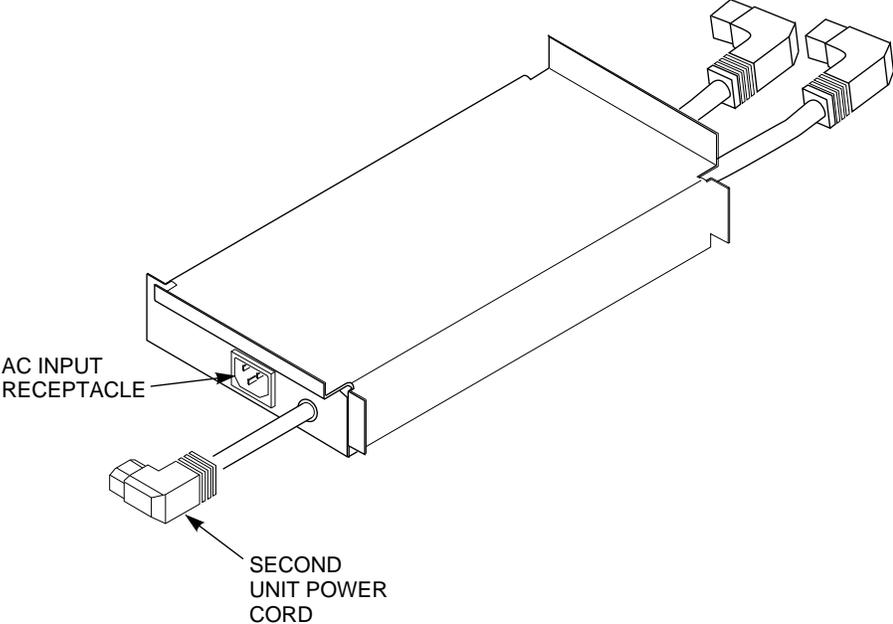
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1.5 Cooling

The two blower assemblies on the back of the SBB shelves cool the pedestal by moving air from the front of the pedestal, through the SBBs and shelf, and out the rear. Digital recommends you replace a defective blower immediately, even though one blower provides enough air flow to keep the devices operating. Installing air flow control baffles (see Section 2.3) improve cooling within the pedestal.

The safety screw and two "press-to-release" mounting tabs secure each blower assembly to the shelf.

CAUTION

You can install either a single-speed or a dual speed blowers in an 8-bit shelf. Install only dual speed blowers in a 16-bit shelf. Do not install both single speed and dual speed blowers in any shelf.

Figure 1–8 Blower Assembly Location
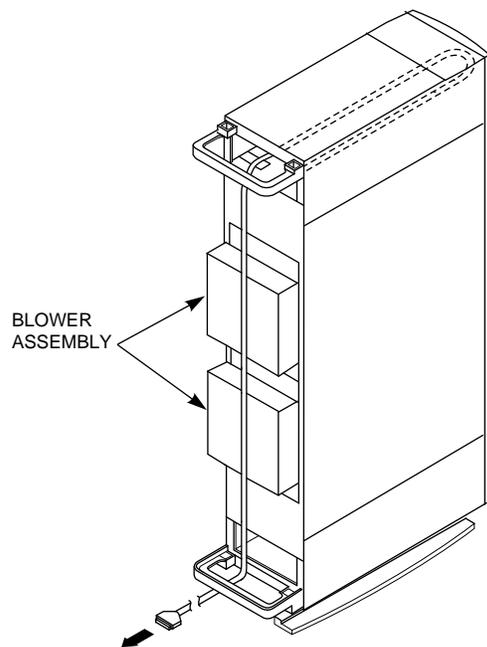
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1.6 Product Specifications

Table 1–4 and Figure 1–9 show the basic pedestal specifications.

Table 1–4 Typical Pedestal Specifications

Physical Specifications		
Nominal Dimensions		
Item	Metric	English
Height	0.6 m	2 ft
Width	0.3 m	1 ft
Depth	0.4 m	1.3 ft
Weight (no devices)	17 kg	37 lb
Rear clearance (air exhaust)	0.3 m	1 ft
Front clearance (door opening)	0.3	1 ft
Dimensions with Service Areas		
Front service area	0.8 m	2.5 ft
Rear service area	0.8 m	2.5 ft
Vertical service area	0.4 m	1.3 ft
Height	1 m	3.3 ft
Width	0.8 m	2.5 ft
Depth	1.9 m	6.3 ft
Pedestal Power		
	Power Supply	
Nominal Output Voltages	131 W	150 W
Mode 1		
+5 V dc	5.6 A	8.4 A
+12 V dc	10.75 A	9.0 A
Mode 2		
+5 V dc	15.0 A	15.0 A
+12 V dc	3.0 A	6.25 A
Disk spinup	4 second interval (minimum)	

Figure 1–9 Pedestal Dimensions

0.8 m
(2.5 ft)

1 m
(3.3 ft)

1.9 m
(6.3 ft)

CXO-4406A-MC

2
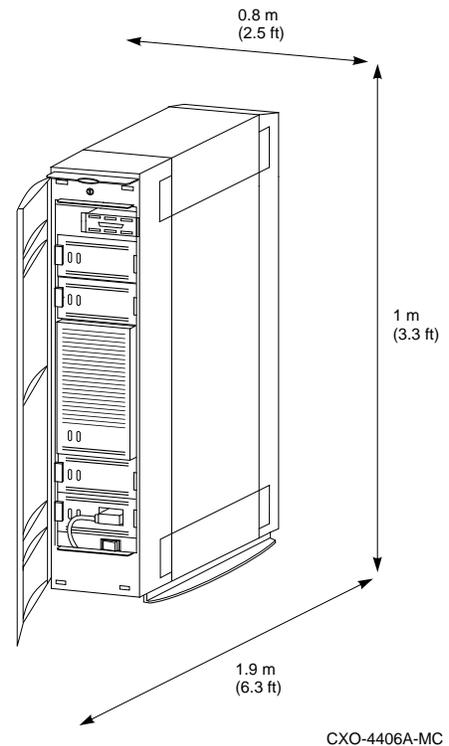
Assembling a Pedestal

This chapter describes the procedures for assembling a pedestal using the BA35X–VA vertical mounting kit and an SBB shelf.

Note

The user supplies the SBB shelf, storage SBBs, power SBBs, and the pedestal power cord.

2.1 Preparations

To expedite the process complete the following procedures before starting to assemble a pedestal.

- Determine the device address for each storage SBB.

- Determine the shelf location for each storage SBB.

- Set the SBB device address switches.

- Determine the shelf SCSI bus configuration (single or split) and

    – Install the terminators and jumpers on an 8-bit shelf

    – or set the bus configuration switches on the 16-bit shelf personality module.

- Determine the optimum routing for the SCSI cables (shortest possible distance).

- Select the base baffle for the 16-bit shelf (see Section 2.3)

2.2 Pedestal Kit Packing

Refer to Figure 2–1 and complete the procedures in Table 2–1 to unpack a pedestal kit.

Table 2–1 To Unpack a Pedestal Kit

1. Carefully remove all packing materials and components.

2. Remove components from shipping container.

3. Remove components from plastic shipping bags.

4. Replace all packing material, including plastic bags, in shipping container.

5. Store the shipping container for future use.

Note

Retain all packing materials for future use. Shipping pedestal kits without using the proper packing materials can cause damage to the kits.

Figure 2–1 Pedestal Kit Packing

TOP

BEZELS (2)

FOAM BLOCK -
BAFFLES

BASE

AC DISTRIBUTION
UNIT

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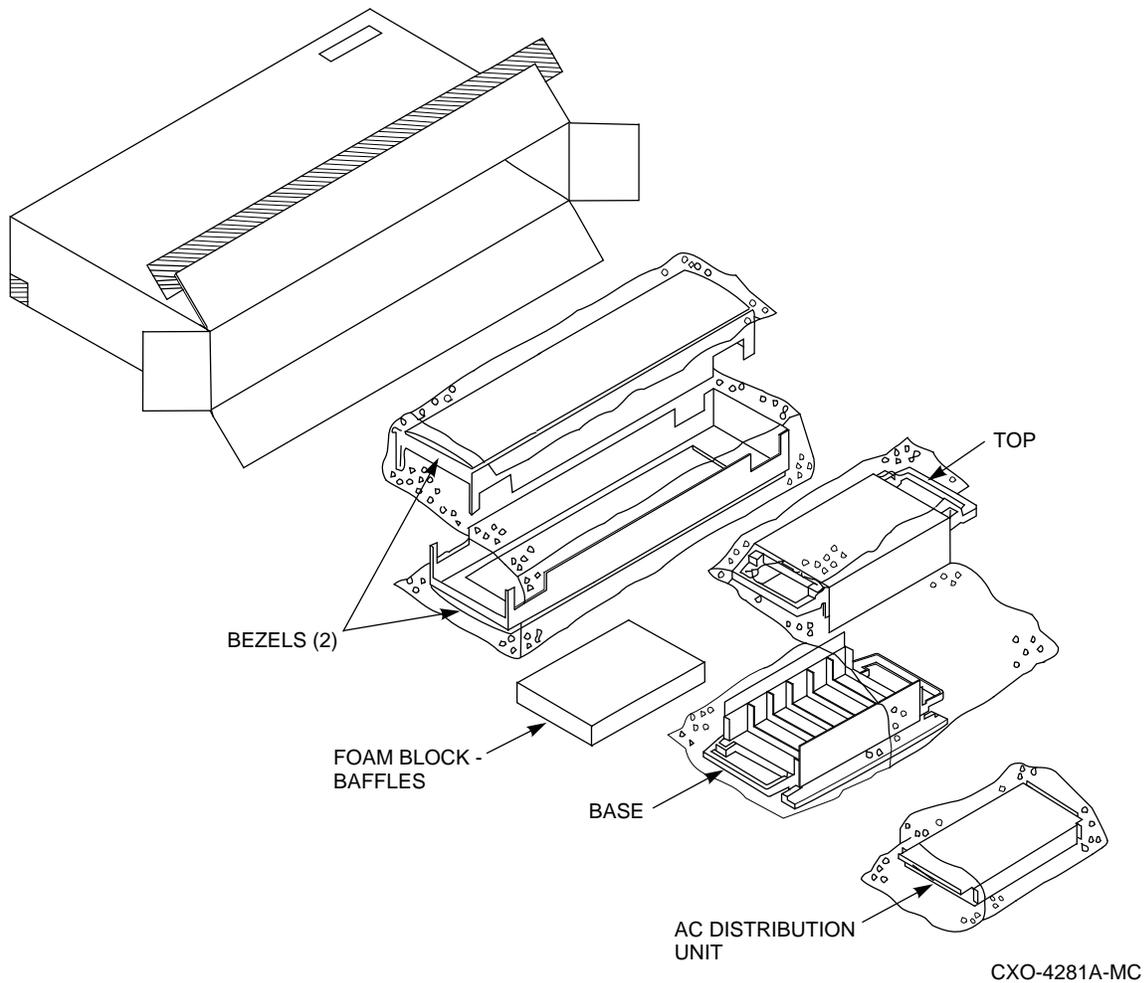
2.3 Selecting the Air Flow Control Baffles

The foam block shown in Figure 2–2 has four precut air flow control baffles (A, B, C, and D). These baffles improve SBB cooling by controlling the circulation of the blower exhaust air within the pedestal. See Figure 2–3 through Figure 2–5 to determine where to install these baffles.

Note

Installing a 7200 rpm device in an 8-bit pedestal requires the BA35X–MJ 8-bit pedestal dual speed blower upgrade kit,

Figure 2–2 Air Flow Control Baffles

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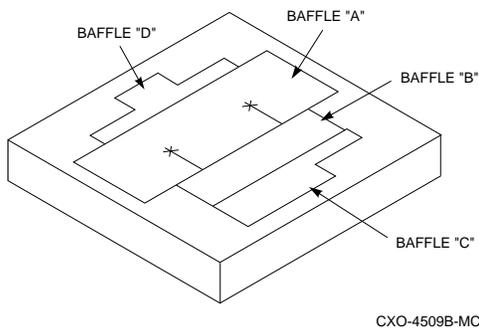
Figure 2–3 Baffles "A' and "B"

Baffle A	Install this baffle in the top of all pedestals as shown. It has two slits for inserting the SCSI cables.

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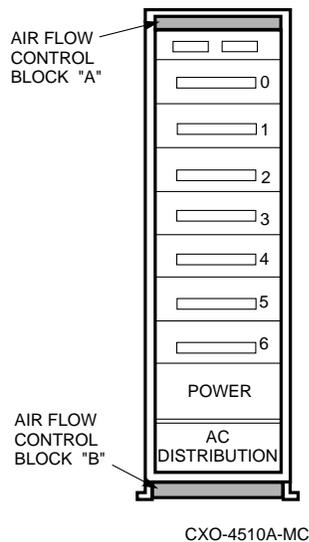
Baffle B	Install this baffle in the base of a single pedestal.

Figure 2–4 Baffles "A' and "C"

CXO-4511B-MC
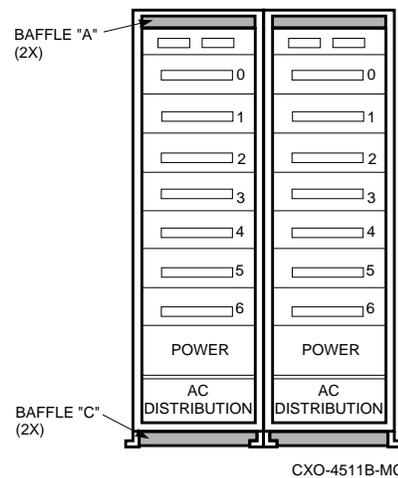
Baffle C	Install this baffle in the base when using a multiple pedestal configuration.

Figure 2–5 Baffles "A," "C,' and "D"

CXO-4512B-MC
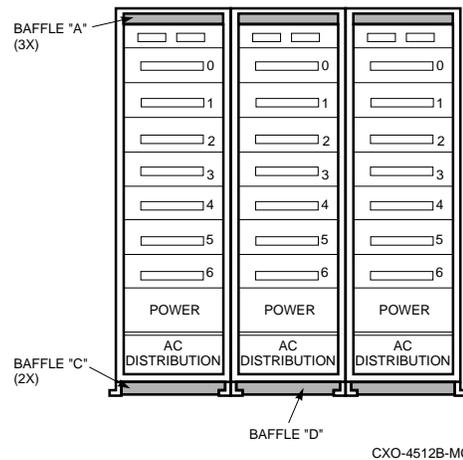
Baffle D	Install this baffle when using a multiple pedestal configuration (three or more pedestals).

2.4 Assembling the Pedestal

You do not need any special tools, test equipment, or techniques to assemble a pedestal.

Figure 2–6 shows the pedestal components, and Table 2–3 lists the components and identifies those that are part of the pedestal kit and those that the user supplies.

Refer to Figure 2–6 and complete the procedure in Table 2–2 to assemble a pedestal.

CAUTION

The two "u-shaped" bezel support brackets on the base and top are not handles. Do not use them to move the pedestal.

Table 2–2 To Assemble a Pedestal

1. Position the base baffle (refer to Section 2.3) midway between the front and rear of the base. The baffle must completely block air flow through the base. Be sure that the baffle is not bent or folded.

2. Install the feet.

3. Place the base in the selected installation area with the "dimple strips" at the rear.

4. Press the 0 switch on the ac distribution unit to turn off the ac output. Insert the distribution unit in the base with the power switch to the front.

5. Carefully align the SBB shelf mounting slots with the dimples at the REAR of the base and insert the **empty** SBB shelf in the base with Slot 7 at the bottom. Push down until it snaps into place.

6. Install the shelf SBB power supply in the bottom shelf slot (Slot 7).

7. Connect one of the ac distribution unit power cords to the shelf SBB power supply.

8. If there is a redundant shelf SBB power supply or battery backup unit (BBU) install it in Slot 6. Connect the second ac distribution unit power cord to the redundant shelf SBB power supply.

9. On an **8-bit** pedestal:

    -   Connect the SCSI input cable to shelf connector JA1 (leftmost connector).

    -   Connect the SCSI output cable to shelf connector JB1 (rightmost connector).

10. On the **16-bit** pedestal

    -   Connect the SCSI input cable to the input (upper) connector on the personality module and tighten the thumbscrews.

    -   Install the adapter module into the shelf and firmly seat it.

11. Insert the SCSI cables into Baffle "A."

12. Install the storage device SBBs starting with the lowest open slot (Slot 6 or Slot 5).

13. Position Baffle "A" near the center of the Top between a set of ribs. Be sure that the baffle is neither bent or folded.

14. Align the dimple strips in the Top with mounting holes in the shelf.

15. Press down on the Top until it snaps into place.

16. Carefully engage the locking tabs at the bottom of the bezel with the base.

17. Carefully rotate the top of the bezel in towards the pedestal until it mates with the top.

18. Be sure that the bezel is firmly seated and that the top and bottom of the bezel are the same distance from the edge of the shelf.

19. Lock the bezel.

Table 2–3 Pedestal Components

Pedestal Kit Components	
No.	Description
❶	Front and rear bezel with door, bezel lock with key, and 4 bezel clips
❷	Top
❸	AC distribution unit
❹	Base with feet
❺	Baffles foam block
User Supplied Components	
No.	Description
①	SBB shelf with blower assemblies, shelf power supply, and storage SBBs
②	AC input power cord
③	SCSI cables

Figure 2–6 Pedestal—Exploded View

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3
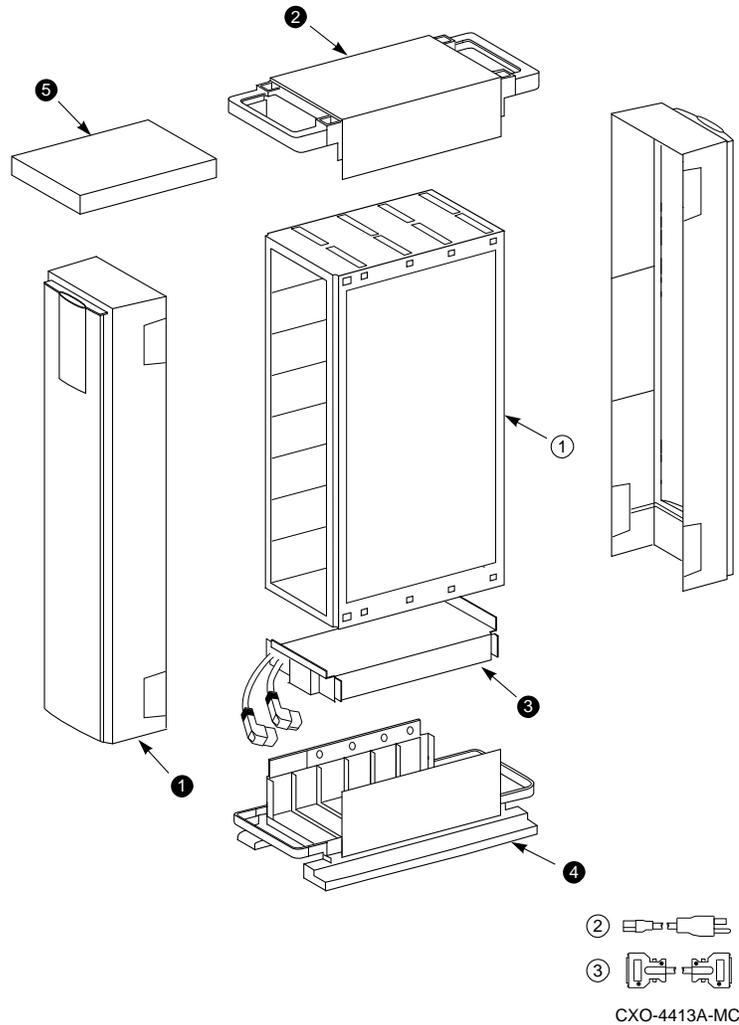
Installing a Pedestal

This chapter describes the procedures for installing either an 8-bit (BA350 series) or a 16-bit (BA356 series) pedestal. Subjects include planning the installation; initial installation procedures; storage device security; replacing storage devices; testing the pedestal; connecting the SCSI cables to the SCSI controller; and connecting the power cables.

3.1 Planning the Installation

Planning the installation involves the following processes:

- Determining the approved installation environment (commercial or home)

- Selecting an area that provides sufficient space

- Considering the SCSI bus restrictions

The location of the pedestal depends upon the SBBs used.

- All SBBs meet FCC Class A standards for use in a commercial environment.

- You can install FCC Class B SBBs in a home environment.

- Use in a home environment requires that *all SBBs* be FCC Class B certified.

The user is responsible for installing the pedestal in the approved environment.

3.2 Selecting the Installation Area

The location of the pedestal depends upon the following:

- The space required for the pedestal to include service areas.

- The length of the SCSI bus cable.

- The location of the ac power source.

The general guidelines for selecting the installation area are:

- Routine operations require a front service area of at least 0.8 m (30 in).

- The pedestal requires at an area at least 0.3 m (1 ft) wide.

- Proper air flow requires a rear service area of at least 0.3 m (1 ft)

- Replacing a blower assembly on any pedestal or changing the 8-bit pedestal bus configuration requires a rear service area of at least 0.8 m (30 in) or that you move the pedestal.

- For proper servicing the pedestal installation area should be at least 1 m (3 ft) high.

As shown in Figure 3–1 the maximum area required for a single pedestal is :

- 1.9 m (6.3 ft) deep
- 0.8 m (2.5 ft) wide
- 1 m (3.3 ft) high

Figure 3–1 Pedestal Installation Dimensions

0.8 m
(2.5 ft)

1 m
(3.3 ft)

1.9 m
(6.3 ft)

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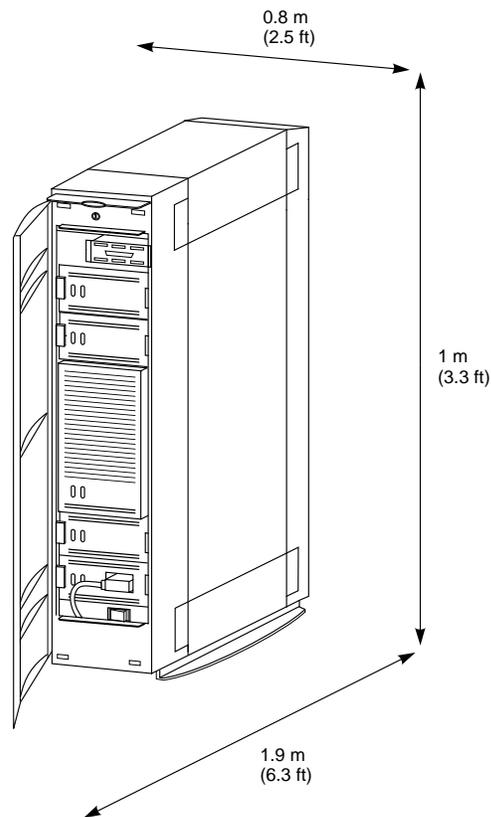
3.3 SCSI Cables

Selecting a SCSI cable requires you to:

- Determine the maximum cable length based upon the:

    – bus type (single-ended or differential)

    – bus speed

- Shelf connectors

Please refer to the following publications for detailed information about the SCSI buses and cables.

StorageWorks Solutions Configuration Guide

StorageWorks Solutions BA350–SB Shelf and SBB Users Guide (8-bit shelves)

StorageWorks Solutions BA356–SB 16-Bit Shelf and SBB Users Guide

Once you have selected the cable you must determine the best route for the cable from the controller to the pedestal. In some cases it may be necessary to relocate the pedestal.
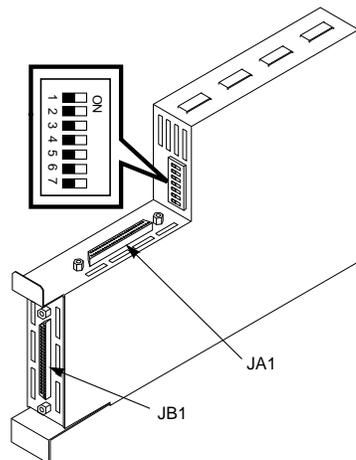

Note

Remember that as much as 1 m (3 ft) of the SCSI cable is within the pedestal.

3.4 Installing the SCSI Cables

The SCSI cables connect to either the shelf backplane connectors (8-bit shelf) or the personality module connectors (16-bit shelf). You can install the cable either through the rear of the pedestal (the primary route) or through the top of the pedestal (the alternate route). The primary route (see Figure 3–3) or the alternate route (see Figure 3–4). The SCSI cables connect to the backplane connector on the 8-bit shelf (adjacent to Slot 0) and to the personality module on a 16-bit shelf (see Figure 3–2).

Figure 3–2 16-bit Personality Module

Note

For detailed information about setting the personality module address switch, and connecting multiple shelves together, refer to the *BA356–SB 16-Bit Shelf and SBB Users Guide.*

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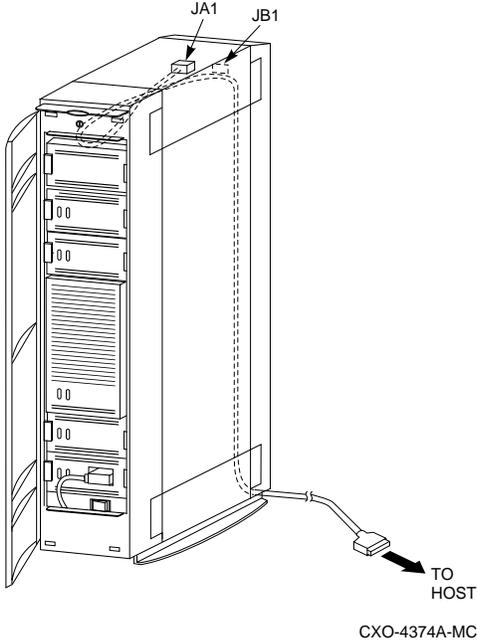
Figure 3–3 SCSI Cables—Primary Route

JA1   JB1

TO HOST

CXO-4374A-MC

Figure 3–4 SCSI Cable—Alternate Path

0.3 m
(1 ft)

0.6 m
(2 ft)

.4 m
(1.3 ft)

CXO-4404A-MC
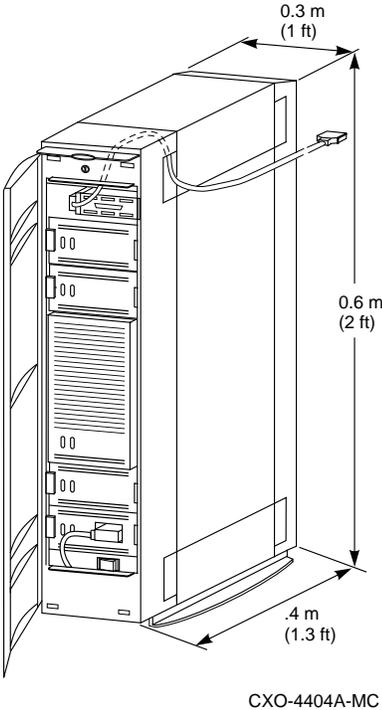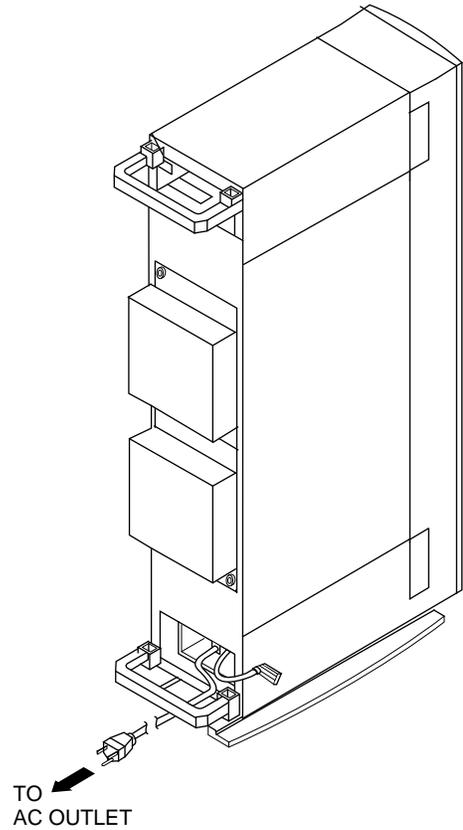
3.5 Installing the Power Cord

As shown in Figure 3–5, the pedestal power cable connects to the rear of the distribution unit.
pedestal.

Figure 3–5 Power Cord Routing

TO
AC OUTLET

CXO-4375A-MC

3.6 Installing SBBs

The **universal ac input power supply** SBB is always mounted in the bottom shelf slot, Slot 7. Storage device SBBs can be installed in any of the other seven slots (Slots 0 through 6). Either a redundant power supply, a BBU, or a storage SBB can be installed in Slot 6.

The combination of the SBB guides, shelf slots, and backplane connectors preclude installing an SBB incorrectly; you can insert and seat an SBB only one way. Each 3.5-inch SBB occupies one shelf slot; each 5.25-inch SBB occupies three shelf slots.

Remove the front bezel to access the SBBs.. You may need a key to remove the bezel.

Depending upon the SCSI controller used, you could have the option of removing and installing an SBB while power is applied to the shelf. The process of removing or installing an SBB while the bus is inactive and power is applied is commonly referred to as a "**warm swap**."

When you insert an SBB in a slot and fully seat it, the two tabs on the front panel expand and engage the shelf, thereby securely mounting the SBB. To remove an SBB you press the two tabs in and remove the SBB.

CAUTION

The procedure for removing or installing SBBs is determined by the SCSI controller. Check your SCSI controller documentation to determine the procedures supported.

Removing or installing an SBB while the SCSI bus is active, a hot swap, can result in corrupted or lost data if the controller does not support hot swap.

Digital controllers, such as the HSJ-series, have switches for deactivating (quiescing) individual buses. Quiescing the bus without turning the SBB shelf power off and replace an SBB is a warm swap.

If you cannot quiesce the bus, you must turn off the power to all SBB shelves on the SCSI bus before you remove or install an SBB. This procedure is referred to as a "**cold swap**."

3.7 Checking Pedestal Operation

When you order a pedestal, it is shipped with the storage SBBs and power SBBs installed. Therefore, once you have connected the ac power cable and the SCSI cable, you can test the basic functionality.

CAUTION

To prevent SCSI bus problems, complete pedestal test without connecting the SCSI cable to the host or SCSI controller.

Table 3–4 To Check the Pedestal

1. Open the front door and turn on the pedestal power. Refer to Figure 3–6 and observe the status light emitting diodes (LEDs) on the shelf power supply in Slot 7 (bottom slot).

   - The power supply status LED (on the right) lights immediately.

   - The green, shelf status LED (on the left) is on when both blowers are at the proper speed.

2. Refer to Figure 3–7 and observe the LEDs on each SBB.

   - The green activity LEDs initially flash on, and then go off.

   - The amber fault LEDs should remain off.

3. Once the initial "spin-up" is complete, the device activity LEDs should flash only when the controller is addressing the device.

4. Turn off the pedestal power.
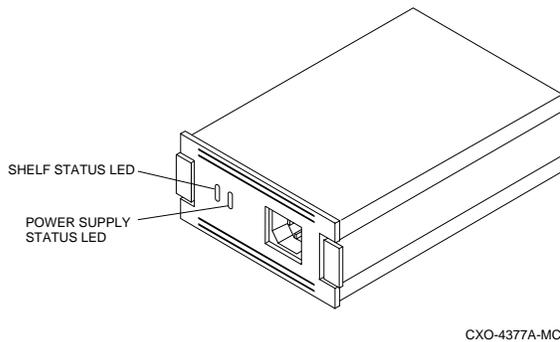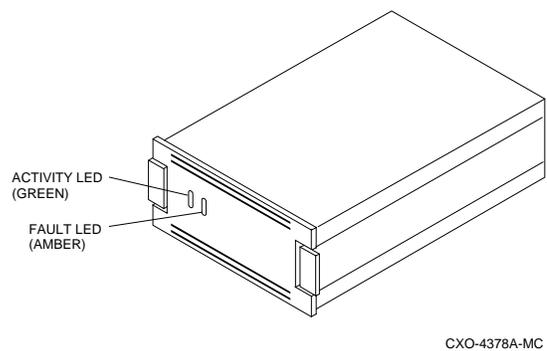
Figure 3–6 Shelf Status LEDs

Figure 3–7 SBB Status LEDs

SHELF STATUS LED

POWER SUPPLY STATUS LED

CXO-4377A-MC

ACTIVITY LED (GREEN)

FAULT LED (AMBER)

CXO-4378A-MC

3.8 Connecting the Controller

The final phase of the installation is connecting the pedestal to the SCSI controller.

CAUTION

Connecting SCSI cables with power applied to either the pedestal or the controller can generate signals that will "**hang**" the SCSI bus. Therefore, always turn off the power on the pedestal and the host controller before connecting the host SCSI bus cable.

Once you have connected the pedestal to the controller, apply power to the pedestal and the controller, and use the SCSI controller to test all devices for proper operation. These procedures are described in the controller user documentation.

3.9 Moving the Pedestal

Once you have installed the pedestal it may be necessary to move it for servicing. The rules for moving a pedestal are as follows:

WARNING

Use two people to move the pedestal when it weighs more than 18 kilograms (40 pounds).

1. Disable the SCSI bus at the controller.

2. Always turn the pedestal off and allow the devices to **spin down** to protect the disk drives.

3. When necessary, disconnect the pedestal power cord and the SCSI cables.

4. Do not lift the pedestal by the bezel or the door.

CAUTION

Always turn the pedestal off and allow the devices allowed to spin-down before moving the pedestal. This will prevent damaging the storage devices.

4

Operating a Pedestal

This chapter describes the procedures for detecting, isolating, and eliminating malfunctions in the pedestal. The pedestal has only one component that can fail—the ac distribution unit. This is not a user replaceable unit, but one that can be replaced by a Digital customer service engineer.

All of the replaceable components are part of the shelf and the associated SBBs. It is possible, but unlikely, that there would be a failure of the SCSI cables or the ac power cords. The following sections describe error indications and the possible causes. For a detailed description of possible problems and recommended solutions, please refer to the shelf users guide.

4.1 Operational Status

LEDs on the SBB bezels indicate the operational status of the shelf power and cooling and the storage device SBBs. Open the front door for a better view of the LEDs. For a detailed description of the SBB status LEDs, please refer to the *BA350–SB Shelf and SBB Users Guide.*

Table 4–1 Pedestal Status LEDs

To determine the status of a power supply

- Observe the power supply status LEDs.

- When the ac input is missing, or either the +5 V dc or the +12 V dc power supply voltages are incorrect, both the shelf status and the power status LEDs are off.

When there is a power supply error indication, complete the procedures in Table 4–3.

Figure 4–1 Power Supply Status LEDs

SHELF STATUS LED

POWER SUPPLY
STATUS LED

CXO-4377A-MC

To determine the status of a blower

- Observe the power supply status LEDs.

- When either blower assembly fails, the shelf status LED on the power SBB is off and the power supply status LED is on.
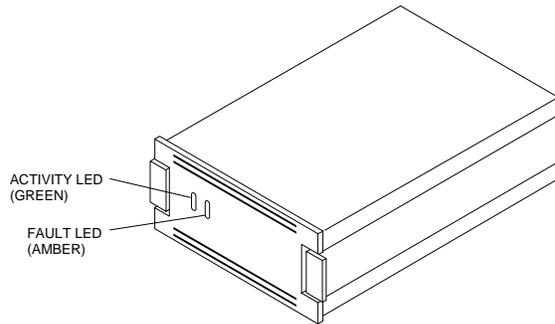
When there is a blower assembly error indication, complete the procedures Table 4–4.
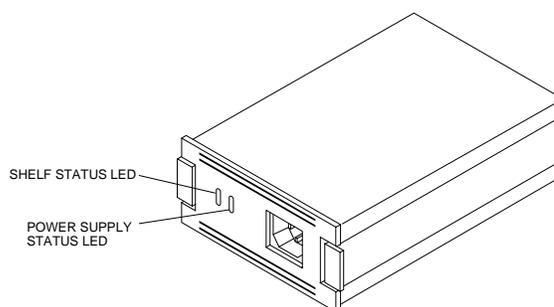
Figure 4–2 3.5-Inch SBB Status LEDs

ACTIVITY LED
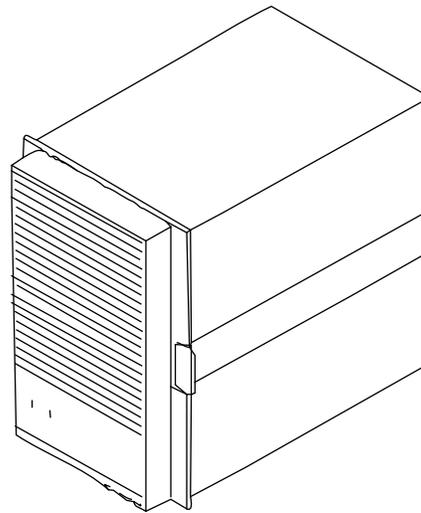(GREEN)

FAULT LED
(AMBER)

CXO-4378A-MC

To determine the status of an SBB

- Observe the green activity LED and the amber fault LED.

- Normally the green activity LED is flashing and the amber activity LED is off.

When these conditions are not met complete the procedures in Table 4–2.

Figure 4–3 5.25-Inch SBB Status LEDs

CXO-4380A-MC

4.2 Replacing an SBB

Replacing either a storage device SBB or a power supply or is basically the same. Refer to Figure 4–4 and complete the procedure in either Table 4–2 or Table 4–3 to replace a pedestal SBB.

Table 4–2 To Replace an SBB

1. Turn the SCSI bus off.
2. Remove the front bezel as described in Table 4–5.
3. Press the mounting tabs on the SBB bezel together and pull the SBB out as shown in Figure 4–4.
4. Insert the same model SBB in the slot and push it in until it is fully seated and the front panel mounting tabs expand and engage the shelf.
5. Replace the front bezel as described in Section 4.4.
6. Turn on the SCSI bus.
7. Check the SBB status LEDs for proper operation.

Table 4–3 To Replace a Power Supply

1. Turn the SCSI bus off.
2. Turn the pedestal power off.
3. Remove the front bezel as described in Table 4–5.
4. Disconnect the shelf power cords.
5. Press the mounting tabs on the SBB bezel together and pull the power supply out as shown in Figure 4–4.
6. Install the replacement power SBB.
7. Connect the shelf power cord.
8. Replace the front bezel as described in Section 4.4.
9. Turn on the pedestal power.
10. Check the power supply status LEDs for proper operation.
11. Turn on the SCSI bus.

Figure 4–4 Removing an SBB
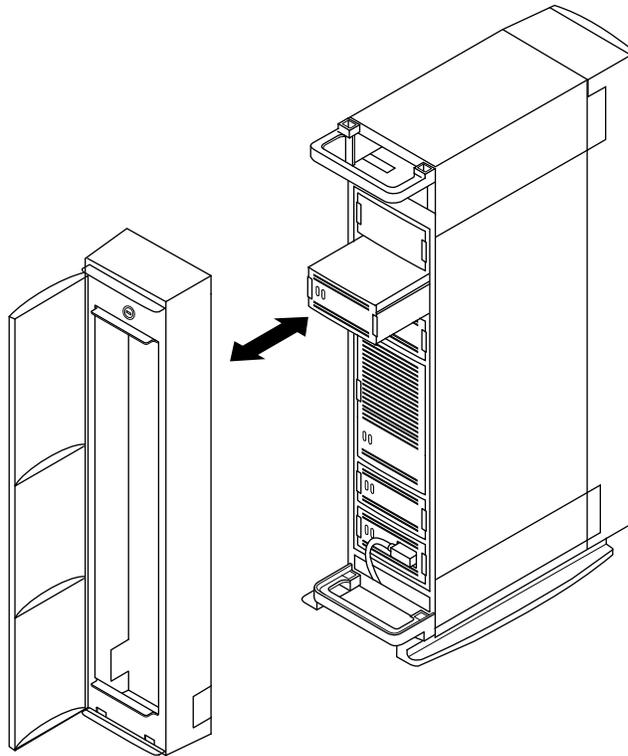
CXO-4376A-MC

4.3 Replacing a Blower Assembly

Failure of either blower assembly turns off the green shelf status LED; the green power supply status LED remains on. Complete the following procedure to replace a defective blower:

CAUTION

Blower assemblies can be replaced without turning off the pedestal power. However, if you have to move the pedestal to replace the blower, you must quiesce the bus and turn power off to the pedestal to prevent damaging the storage devices when moving the pedestal.

Table 4–4 To Replace a Blower Assembly

1. Remove the rear bezel as described in Table 4–5.

2. Locate the blower that is not running and remove the safety screw (see Figure 4–5).

3. Press in on the two mounting tabs and remove the blower assembly.

4. Align the connector on the replacement blower assembly with the connector on the shelf.

5. Push in on the blower assembly until it is fully seated and the locking tabs engage the shelf.

6. Install the safety screw.

7. Turn on the power. The blower begins operating and shelf status LEDs are both on.

8. Replace the rear bezel as described in Table 4–5.

Figure 4–5 Blower Assembly Replacement

CXO-4405A-MC
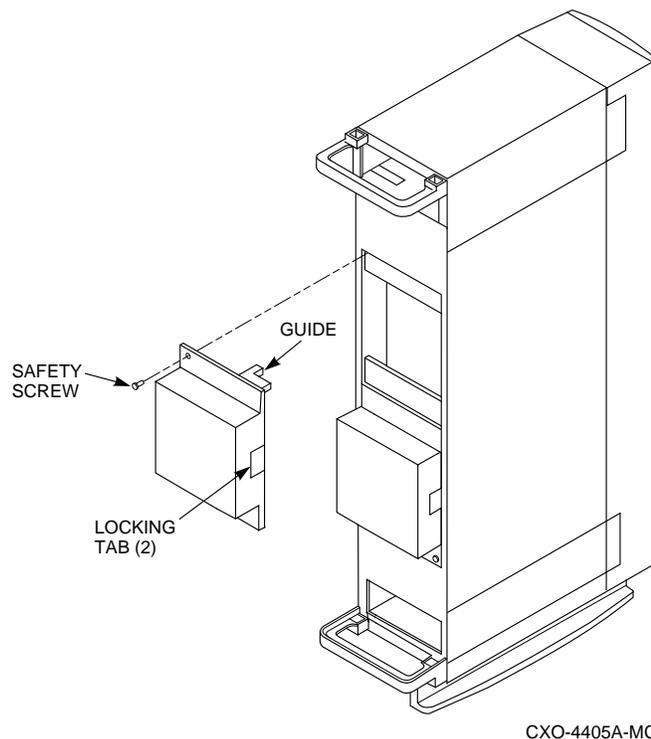
4.4 Disassembling a Pedestal

Almost all maintenance procedures require you to remove and replace the pedestal bezel. The procedure in Table 4–5 is the same whether you are removing the front or rear bezel.

Table 4–5 Removing and Installing a Bezel

1. Open the door and unlock the bezel.

2. Turn the bus off either at the controller or by turning off the pedestal power.

3. Grasp the bezel at the top and rotate the bezel out and down from the pedestal until the locking tabs at the bottom of the bezel disengage the base.

4. Once you have removed the bezel, you can remove SBBs, install cables, or complete all other maintenance procedures.

5. Carefully engage the locking tabs at the bottom of the bezel with the base.

6. Carefully rotate the top of the bezel in towards the pedestal until it mates with the top.

7. Be sure that the bezel is firmly seated and that the top and bottom of the bezel are the same distance from the edge of the shelf.

8. Lock the bezel.

9. Apply power, activate the SCSI bus, and check that the pedestal is operating correctly.

10. Close the front door.

Table 4–6 To Replace a Shelf

1. Remove both bezels as described in Table 4–5

2. Disconnect all power cords:

3. Record the slot in which each SBB is installed.

4. Remove all SBBs.

5. Disconnect the SCSI cables.

<div align="center">

Note

</div>

The shelf fits tightly into the base and top. You must pull hard to remove the top or the shelf.

6. Hold the shelf in place and lift up on the front of the top to disengage it from the shelf.

7. Hold the base in place and lift up on the shelf to disengage it from the base.

8. Carefully align the replacement shelf mounting slots with the base dimple strips at the REAR of the base and fully seat the shelf.

9. Carefully align the dimple strips at the rear of the top with the shelf mounting slots and fully seat it.

10. Connect the SCSI cables to the shelf.

11. Install the shelf power supply.

12. Install the SBBs.

13. Connect the power cords.

14. Install the front and rear bezel as described in Table 4–5.

15. Apply power and check pedestal operation.

Glossary

ac distribution unit
The deskside expansion pedestal ac input device.

battery backup unit
See BBU.

BBU
Battery backup unit. Extends power availability after the loss of primary ac power, or a power supply to protect against the corruption or loss of data.

blower assembly
An airflow device mounted in a StorageWorks shelf.

building block shelf
See SBB shelf.

cold swap
A method of device replacement that requires that power be removed from all shelves in a cabinet. This method is used when conditions preclude the use of the warm swap or hot swap methods.
See also warm swap and hot swap.

controller
A hardware/software device that facilitates communications between a host and one or more devices. A controller translates bus protocols and hardware interfaces and adds functionality to the host/device communications.

controller and SBB shelf
A generic reference to a StorageWorks shelf that can contain both controller SBBs and storage SBBs (for example, a BA350–EA shelf).

controller shelf
A StorageWorks shelf designed to contain controller and cache memory modules.

daisy chain
A common method of connecting ac power or SCSI buses from the source through a shelf or enclosure to another shelf or enclosure.

pedestal kit
The enclosure, ac distributions unit, and universal ac shelf power supply used to create a deskside expansion pedestal. Also referred to as a pedestal kit.

deskside expansion pedestal
An enclosure, commonly referred to as a pedestal, that houses a StorageWorks shelf in a vertical position. This pedestal is assembled from a pedestal kit, and a user supplied SBB shelf, storage SBBs, and an ac power cord. The number of devices that can be used, the SCSI buses supported, and the location of the pedestal is determined by the SBB shelf, the storage SBBs, and the SCSI controller used. Also referred to as a pedestal.

host computer
Commonly referred to as the host, this is the primary or controlling computer to which a storage subsystem is attached.

hot swap
A method of device replacement whereby the complete system remains on line and active during device removal and reinstallation. The device being removed or reinstalled is the only device that cannot perform operations during this process.
See also cold swap and warm swap.

modular carrier
The plastic container in which storage devices or power supplies are mounted to form SBBs. Modular carriers are available in both 3.5-inch and 5.25-inch form-factors.

redundant power option
The capability of StorageWorks shelves to have either a primary and secondary shelf power supply. Should one supply fail, the second supply provides the power required for proper operation. Implementing this option extends the operational time of the shelf.

Note

Having a primary power supply and a battery backup unit (BBU) does not provide redundant power. The BBU only provides enough power to allow the devices to spin-down, thereby preventing data corruption.

SBB
StorageWorks building block. A device housed in a standard StorageWorks SBB carrier. An SBB has a standard physical and electrical interface that is compatible with those of StorageWorks shelves and enclosures.

SBB shelf
StorageWorks building block shelf. A StorageWorks shelf, such as the BA350–SB, designed to house plug-in SBB modules.

SCSI
Small computer system interface. An ANSI interface defining the physical and electrical parameters of a parallel I/O bus used to connect hosts to a maximum of seven devices. The StorageWorks device interface is implemented according to the SCSI–2 standard, allowing the synchronous transfer of 8-bit data at rates of up to 10 MB/s.

single-ended SCSI bus
A bus in which each signal's logic level is determined by the voltage of a single wire in relation to ground.

small computer system interface
See SCSI.

split bus
The single SBB shelf SCSI bus that is configured as two individual buses (a four device bus and a three device bus) is commonly referred to as a split bus.

spin-down
The process that begins when power is removed from a storage device and data transfer halts, and ends when the device is stopped and can be moved. In the case of disk drives, the heads are retracted and the media is stopped.

spin-up
The process that begins when power is applied to a storage device, and ends when the device is determined to be operational and ready for data transfer operations.

storage array subsystem
The controllers, storage devices, shelves, cables, and power supplies that form a mass storage subsystem.

StorageWorks
Digital's family of modular data storage products that allows customers to design and configure their own storage subsystems. Components include power, packaging, cabling, devices, controllers, and software. Customers can integrate devices and array controllers in StorageWorks enclosures to form storage subsystems.

StorageWorks building block
See SBB.

universal ac input power supply
A StorageWorks power supply that produces +5 V dc and +12 V dc power from an ac input.

warm swap
A controller function that allows devices to be added, removed, or replaced while the subsystem remains operational. All activity on the device's SCSI bus must normally be halted for the duration of the warm swap operation.
See also cold swap and hot swap.

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