



# BA346–K Series Deskside Expansion Pedestal

---

## User's Guide

Order Number EK–BA346–UG. A01

This guide describes the procedures for installing, configuring, and maintaining the BA346–K series deskside expansion pedestal.

---

**March 1995**

While Digital believes the information included in this publication is correct as of the date of publication, it is subject to change without notice.

Digital Equipment Corporation makes no representations that the interconnection of its products in the manner described in this document will not infringe existing or future patent rights, nor do the descriptions contained in this document imply the granting of licenses to make, use, or sell equipment or software in accordance with the description.

**FCC ID: AO9-BA346**

**NOTE:** This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

Any changes or modifications made to this equipment may void the user's authority to operate this equipment.

This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna

- Increase the separation between the equipment and receiver

- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected

- Consult the dealer or an experienced radio/TV technician for help

© Digital Equipment Corporation 1995

All Rights Reserved.

Printed in the United States of America.

HSJ, StorageWorks, and the DIGITAL logo are trademarks of Digital Equipment Corporation.

This document was prepared using Microsoft Word for Windows 6.0®

---

# Contents

## Chapter 1 Introducing the Deskside Expansion Pedestal

1.1 Product Description.....	1-1
1.2 Options .....	1-2
1.3 Major Components.....	1-3
1.4 Power.....	1-4
1.5 Device Cooling .....	1-6
1.6 StorageWorks Building Blocks (SBBs).....	1-7
1.7 Product Specifications.....	1-8

## Chapter 2 Installing and Operating the Pedestal

2.1 Installing a Pedestal .....	2-1
2.2 Selecting the Installation Area .....	2-2
2.3 Unpacking a Pedestal .....	2-2
2.4 Packing a Pedestal .....	2-4
2.5 Preparing the Pedestal for Operation.....	2-5
2.6 Mounting the Base .....	2-5
2.7 Installing Options .....	2-6
2.8 Configuring the Pedestal.....	2-6
2.9 Installing SBBs .....	2-7
2.10 Connecting the SCSI Bus Cables.....	2-8
2.11 Connecting the AC Power Cord .....	2-9
2.12 Operating the Pedestal .....	2-10
2.13 Mounting the Door.....	2-11
2.14 Replacing a Storage SBB .....	2-12

## Chapter 3 Configuring a Pedestal

3.1 The Standard Configuration.....	3-1
3.2 SCSI Bus Cables and Accessories.....	3-2
3.3 SCSI Buses .....	3-3
3.4 Internal SCSI Buses .....	3-4
3.5 Removing the Side Panel .....	3-5
3.6 Setting the Configuration Address.....	3-6
3.7 Device Addresses.....	3-8
3.8 Completing the Configuration.....	3-8

## Glossary

## Index

## Figures

Figure 1–1	BA346–KB Deskside Expansion Pedestal.....	1–1
Figure 1–2	BA346 – Rear View .....	1–4
Figure 1–3	DC Power Distribution .....	1–4
Figure 1–4	Pedestal Air Flow .....	1–6
Figure 1–5	Typical 3.5–Inch SBB .....	1–7
Figure 2–1	Pedestal Dimensions .....	2–1
Figure 2–2	Pedestal Packing .....	2–3
Figure 2–3	Mounting the Base .....	2–5
Figure 2–4	Standard BA346–KB Configuration .....	2–6
Figure 2–5	3.5-Inch SBB .....	2–7
Figure 2–6	Installing an SBB .....	2–7
Figure 2–7	BN21K-Series Cable Connectors.....	2–8
Figure 2–8	BN21L-Series Cable Connectors .....	2–8
Figure 2–9	Rear Panel Connectors .....	2–9
Figure 2–10	Power Supply Label.....	2–9
Figure 2–11	Pedestal Power On LED .....	2–10
Figure 2–12	Storage SBB Status LEDs.....	2–10
Figure 2–13	Mounting the Door.....	2–11
Figure 3–1	Standard (Shipping) Configuration .....	3–1
Figure 3–2	SCSI Cables and Accessories.....	3–2
Figure 3–3	BA346–KB SCSI Bus Lengths .....	3–4
Figure 3–4	Removing the Side Cover .....	3–5
Figure 3–5	Side Cover Hand Hold.....	3–5
Figure 3–6	Address Configuration Jumpers.....	3–6
Figure 3–7	BA346–KB Standard Configuration .....	3–6

## Tables

Table 1–1	Major BA346–K Series Pedestal Components.....	1–3
Table 1–2	Power Supply Specifications.....	1–4
Table 1–3	Recommended Country-Specific AC Power Cords.....	1–5
Table 1–4	BA346–KB Pedestal Specifications.....	1–8
Table 1–5	Air Flow .....	1–8
Table 3–1	Standard Configuration Specifications.....	3–1
Table 3–2	SCSI Bus Accessories.....	3–2
Table 3–3	SCSI Buses and Cables.....	3–3
Table 3–4	Determining SCSI Bus Lengths .....	3–4
Table 3–5	Standard Configuration Addresses and Slot Addresses.....	3–7

---

# Preface

The *StorageWorks BA346–K Series Deskside Expansion Pedestal User’s Guide* describes the installation, configuration, and maintenance of this family of pedestal storage arrays.

## Intended Audience

This guide is for use by individuals responsible for configuring, installing, and maintaining pedestals.

## Structure

The organization of this guide is as follows:

- |           |  |
|-----------|--|
| Chapter 1 | This chapter is an introduction to the pedestal that includes product description, features, StorageWorks building blocks, power, fans, and product specifications.  |
| Chapter 2 | This chapter describes how to install a deskside pedestal and includes: <ul style="list-style-type: none"><li>● Unpacking pedestals</li><li>● Selecting the installation area</li><li>● Selecting SCSI buses and cables</li><li>● Connecting the pedestal to the SCSI controller</li><li>● Installing the SBBs</li></ul> |
| Chapter 3 | This chapter contains the following pedestal configuration procedures: <ul style="list-style-type: none"><li>● Connecting the internal SCSI bus Cabling</li><li>● Setting the configuration address</li><li>● Setting device addresses</li></ul>   |

## Related Documents

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

<u>Document Title</u>	<u>Order Number</u>
<i>StorageWorks Solutions BA346–KB Deskside Expansion Pedestal 5.25-Inch Device Installation Guide</i>	EK–346AA–IG
<i>StorageWorks Solutions BA346–KB Deskside Expansion Pedestal Dual Bus Installation Guide</i>	EK–346AB–IG
<i>StorageWorks Solutions Configuration Guide</i>	EK–BA350–CG
<i>StorageWorks Solutions SBB User’s Guide</i>	EK–SBB35–UG

## Documentation Conventions

The documentation conventions in this guide are as follows:

**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 publication titles. In the glossary, italic type indicates cross-references.

---

# Introducing the Deskside Expansion Pedestal

This chapter is an introduction to the **BA346–KB series deskside expansion pedestal**, commonly referred to as the “pedestal.” This description includes the options, components, power and cooling requirements, **StorageWorks building blocks (SBBs)**, and specifications.

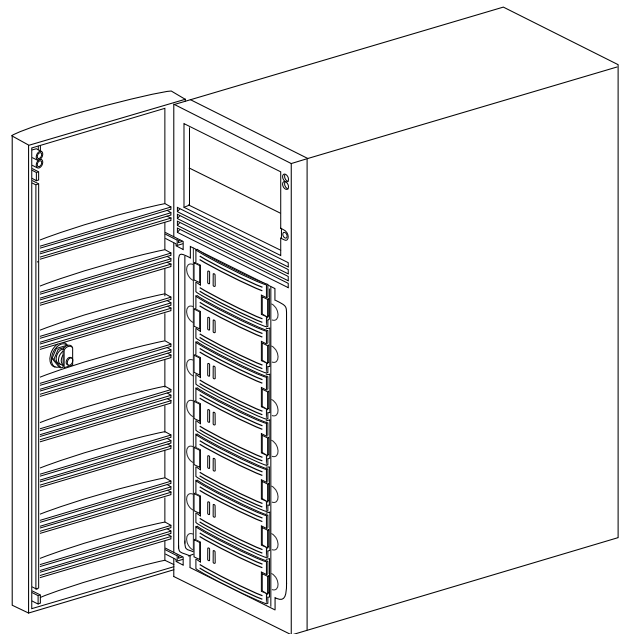
## 1.1 Product Description

The standard BA346–KB deskside expansion pedestal (pedestal) shown Figure 1–1 is an enclosure for creating a user-defined **storage array** using the **small computer system interface (SCSI) bus**. The following are the features of this pedestal:

- **Single-ended, 8-bit or 16-bit, SCSI–2 bus**
- Capacity of seven, 3.5-inch SBBs
- 68-pin, high-density input and output connectors
- ac power supply (switch selectable input 50 to 60 Hz, 115 to 240 V ac)
- Cooling fan
- Jumper selectable SCSI address configurations
- Active SCSI bus termination

To expand the number of devices on a 16-bit SCSI bus you can interconnect the pedestals providing you do not exceed the SCSI bus length limitations listed in Chapter 3.

**Figure 1–1 BA346–KB Deskside Expansion Pedestal**



CXO-4552A-MC

## 1.2 Options

You can install the following options in a pedestal either individually or in combination:

### **BA35X-AA 5.25-Inch Device Option Kit**

This kit contains a modular carrier, the cables, and the mounting hardware for installing either two half-height, or one full-height, 5.25-inch storage device in the top of the pedestal. This option increases the total number of devices on a 16-bit bus to nine.

See *StorageWorks Solutions BA346-KB Deskside Expansion Pedestal 5.25-Inch Device Installation Guide* for detailed information about installing and configuring this option.

### **BA35X-AB Dual-Bus Option Kit**

With the cables and connectors in the dual bus option kit you can split the backplane bus into two buses—a four device bus and a three device bus. When used in conjunction with the 5.25-inch option kit, you can have a six device bus and a three device bus in the same pedestal.

See *StorageWorks Solutions BA346-KB Deskside Expansion Pedestal Dual Bus Installation Guide* for detailed information about installing and configuring this option.

### **BA35X-VB Stability Option Kit**

This kit includes a base that improves the stability of the pedestal. The procedures for installing the base are described in Section 2.6.

### **BA35X-YA Factory Configuration Option**

When you select this option, the factory:

- Sets the configuration addresses (jumpers W1-W3) as the user specifies.
- Installs the SBBs in the slots the user specifies.
- Sets the SCSI device addresses.
- Installs the 5.25-inch modular carrier option and devices.
- Installs the dual bus option.
- Configures the internal SCSI bus.
- Includes, but does not mount, the pedestal door.



## 1.3 Major Components

The user is responsible for providing the following components, which are available through your Digital account representative:

- AC power cord with NEMA 15 connector (see Table 1–3)
- Storage Devices—5.25-inch devices and 3.5-inch SBBs
- SCSI cables (BN21K or BN21L)

Table 1–1 lists the major pedestal components supplied with the basic unit and each option.

**Table 1–1 Major BA346–K Series Pedestal Components**

<b>Component</b>	<b>BA346–KB</b>	<b>BA35X–AA</b>	<b>BA35X–AB</b>	<b>BA35X–VB</b>
Base, Pedestal	0	0	0	1
Cable, Adapter (68-pin to 50-pin)	0	1	0	0
Cable, Input/Output	1	0	3	0
Cable, Input/Output, 5.25-inch device	0	1	0	0
Cable, Jumper	1	0	0	0
Door	1	0	0	0
Enclosure	1	0	0	0
Terminator	1	0	1	0

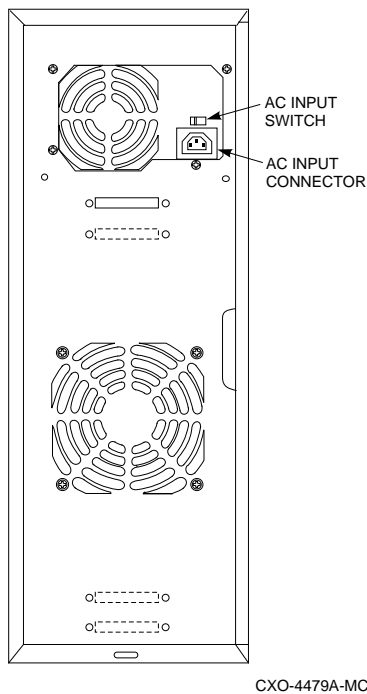
## 1.4 Power

The ac power supply (switch-selectable 115 V ac or 230 V ac input), is located in the rear of the pedestal as shown in Figure 1–2. Figure 1–3 shows the internal dc power distribution, Table 1–2 lists the power supply specifications, and Table 1–3 lists the country specific ac power cords.

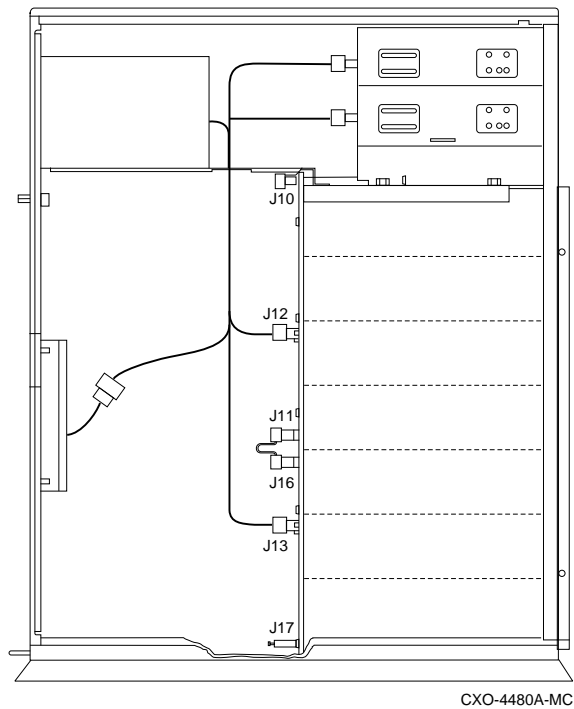
**Table 1–2 Power Supply Specifications**

Specification	Rating
Power	200 W
Nominal Output Voltages	+5 V dc @ 20 A +12 V dc @ 8 A

**Figure 1–2 BA346 – Rear View**



**Figure 1–3 DC Power Distribution**



**Table 1–3 Recommended Country-Specific AC Power Cords**

Country	Voltage	Amps	Connector Type	Plug Type	Length		Digital Order No.
					M	Ft	
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

## 1.5 Device Cooling

Proper device operation requires cooling. The two fans in the pedestal and in the power supply.

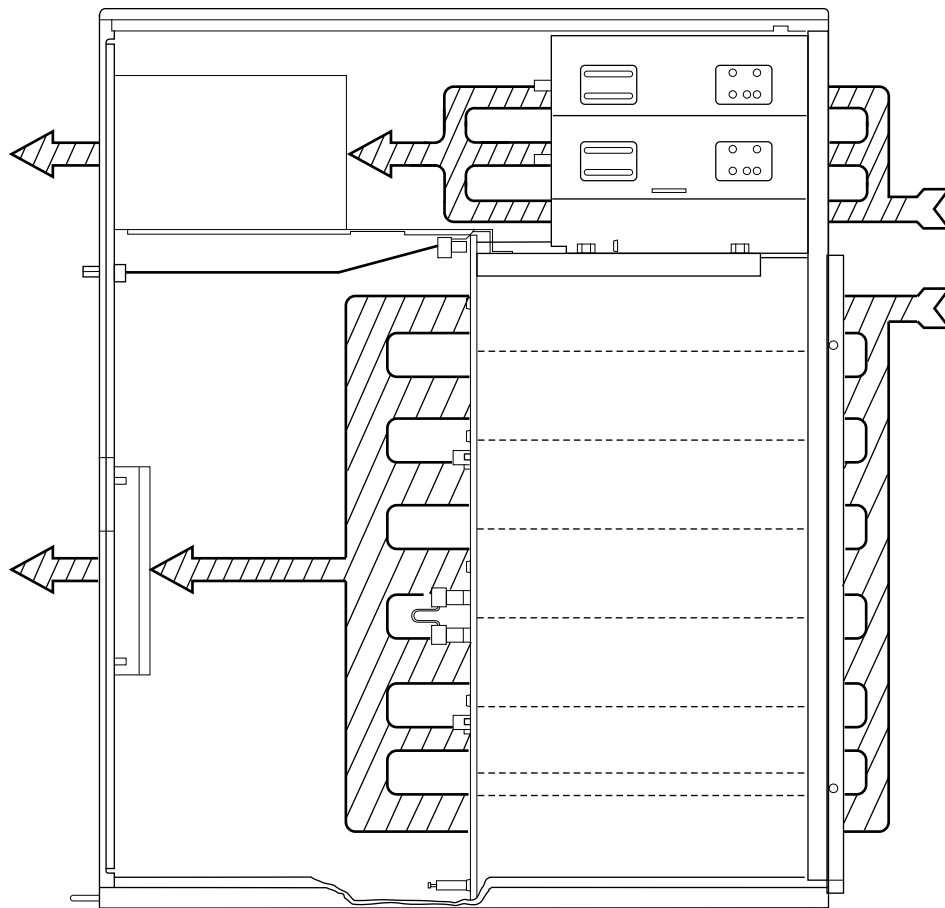
- The fan mounted on the rear of the pedestal cools the storage devices.
- The power supply internal fan cools the 5.25-inch devices and the power supply.

As shown in Figure 1–4, both fans draw air through the front of the pedestal, through the storage devices, and exhaust it out the rear.

### CAUTION

Blocking or restricting the intake or output air flow can cause overheating. Therefore, leave a clear space of at least 0.3 m (1 ft) in front and behind the pedestal.

Figure 1–4 Pedestal Air Flow

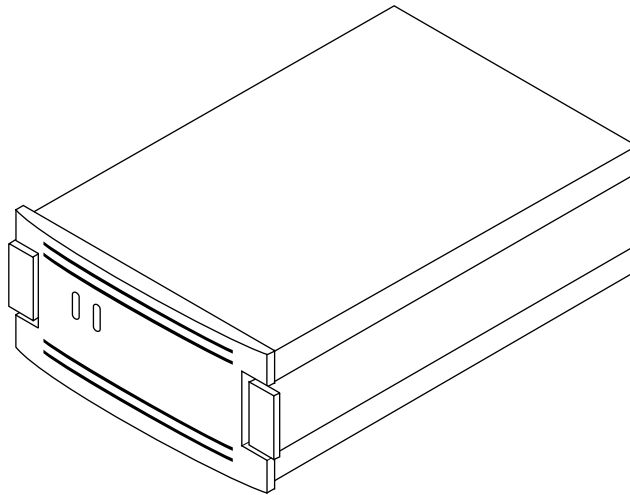


CXO-4481A-MC

## 1.6 StorageWorks Building Blocks (SBBs)

The pedestal supports only 3.5-inch form-factor storage devices in a **modular carrier**, an SBB (see Figure 1–5). The *StorageWorks Solutions Configuration Guide* lists the pedestal compatible 3.5-inch storage devices.

**Figure 1–5 Typical 3.5-Inch SBB**



CXO-4379A-MC

The following primary factors determine the compatible storage devices:

- The SCSI controller must support all the storage devices.
- The SCSI controller must support all the combinations of storage devices on the bus.
- The pedestal does not support 5.25-inch SBBs.
- The pedestal does support 5.25-inch devices mounted in the 5.25-inch modular carrier option (BA35X-AA).

## 1.7 Product Specifications

Table 1–4 lists the basic product specifications.

**Table 1–4 BA346–KB Pedestal Specifications**

Physical Specifications		
Item	Dimension	
Height	533 mm	21 in
Width	203 mm	8 in
Depth	483 mm	19 in
Rear clearance (air exhaust)	305 mm	12 in
Front clearance (door opening)	305 mm	12 in
Weight (no devices)	17 kg	37 lb
Power		
Item	Rating	
Total Power	200 W	
Nominal Output Voltages	+5 V dc @ 20 A +12 V dc @ 8 A	
Device startup*	4 second interval (minimum)	
Power available to 5.25-inch devices	+5 V dc @ 20 A +12 V dc @ 8 A	

Table 1–5 lists the air flow through the pedestal under test conditions with the door open.

**Table 1–5 Air Flow**

Device	Qty	Slots	Measured at	Volume (CFM)
5.25-inch devices 3.5-inch devices	2 7	All filled	Both 5.25-inch slots	2.86
5.25-inch devices 3.5-inch devices	2 6	Slot 7 (bottom) empty	Both 5.25-inch slots	2.74
5.25-inch devices 3.5-inch devices	2 7	All filled	RZ28B in Slot 4	2.34
5.25-inch devices 3.5-inch devices	2 6	Slot 7 (bottom) empty	RZ28B in Slot 4	1.79

---

\* This is the time required before a storage device is ready to transfer data. For example, the time it takes a disk to spin up, a tape drive to tension, and so forth.

---

## Installing and Operating a Pedestal

This chapter describes the procedures for installing and operating a BA346–KB series desktside expansion pedestal. Subjects addressed include selecting the installation area, unpacking the pedestal, installing storage devices, connecting cables, and checking pedestal operation

### 2.1 Installing a Pedestal

You can usually install the pedestal within 2 meters (6.6 feet) of the SCSI controller and next to an ac receptacle. A desktop, a table, or the floor are acceptable installation locations. Figure 2–1 shows the *minimum* pedestal dimensions.

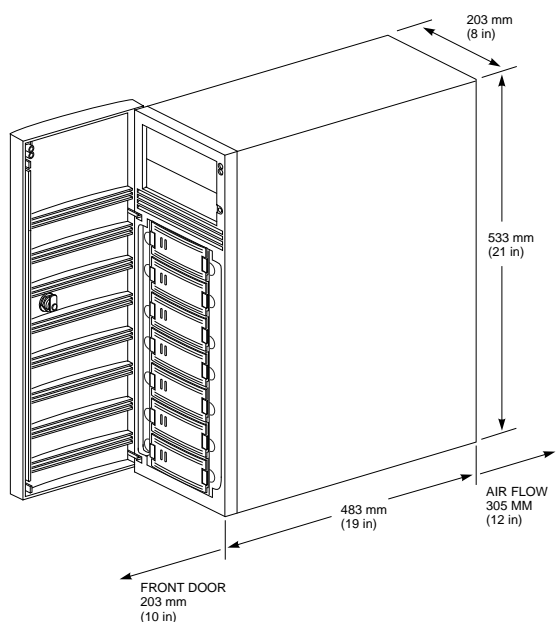
#### CAUTION

---

Blocking or restricting the input or output air flow can cause overheating. Therefore, leave a clear space of at least 0.3 m (1 ft) at both the front and rear of the pedestal.

---

Figure 2–1 Pedestal Dimensions



## 2.2 Selecting the Installation Area

The location of the pedestal depends upon the availability of ac power and the distance to the SCSI controller. SCSI bus length is critical to selecting the installation area. Therefore, before selecting the installation area, read Section 3.3.

### CAUTION

---

Blocking or restricting the input or output air flow can cause overheating. Therefore, leave a clear space of at least 0.31 m (1 ft) at both the front and rear of the pedestal.

---

## 2.3 Unpacking a Pedestal

The shipping containers provide maximum protection for the pedestal and all components. Digital recommends that you unpack the pedestal in the installation.

### WARNING

---

To prevent personal injury always use two people to pack, unpack, or move the pedestal in the shipping container.

---

Refer to Figure 2–2 and complete the following procedure to unpack a pedestal:

1. Orient the shipping container as shown.
2. Open the shipping container. Slide the pedestal and the packing material on to the floor .
3. Remove the documentation package.
4. Remove the top foam blocks.
5. Remove the door.
6. Remove the pedestal.
7. Replace all packing material, including plastic bags, in shipping container.
8. Store the shipping container for future use.

### Note

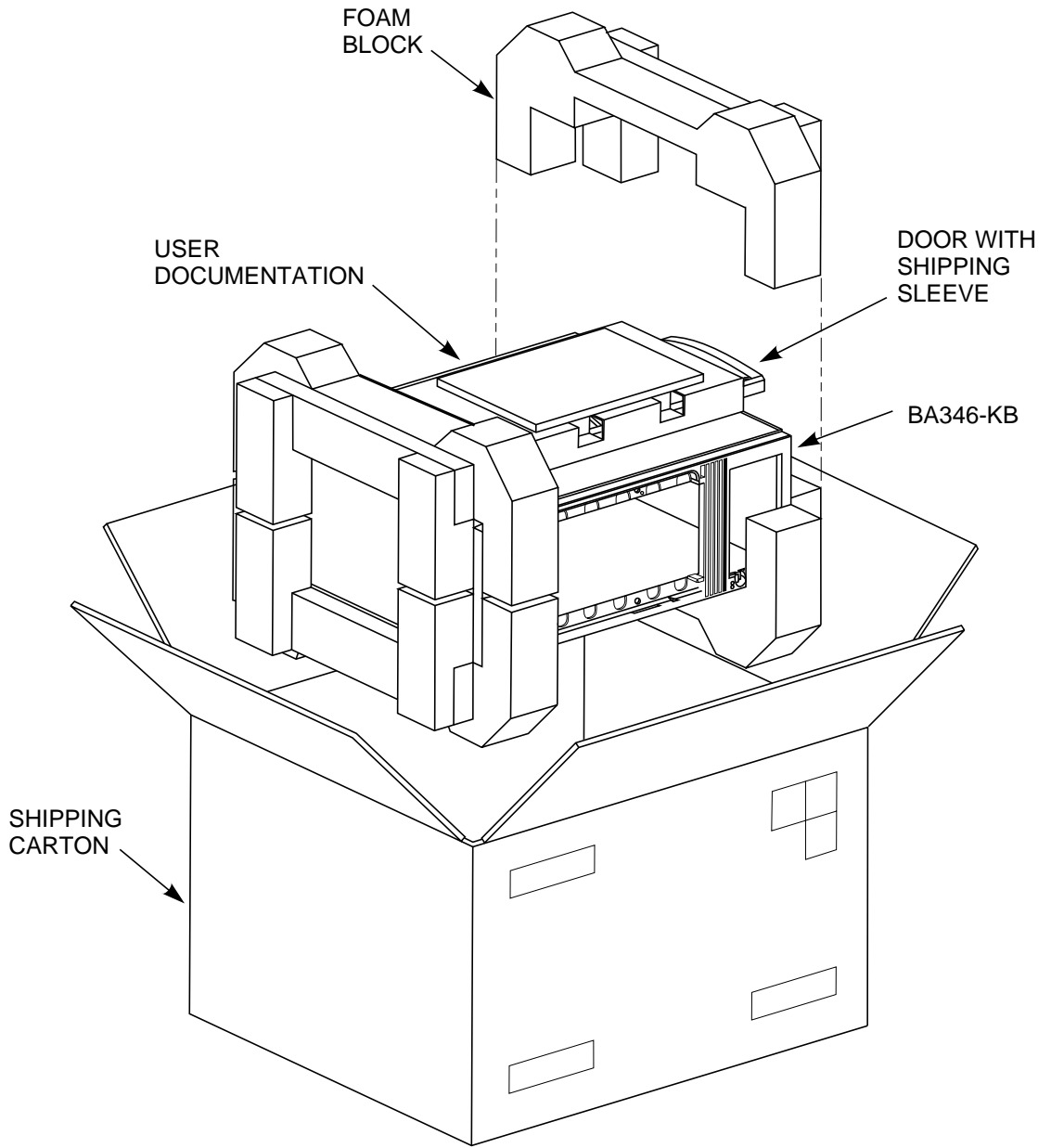
---

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

---



**Figure 2-2 Pedestal Packing**



CXO-4633A-MC

## 2.4 Packing a Pedestal

### **WARNING**

---

To prevent personal injury always use two people to pack, unpack, or move the pedestal in the shipping container.

---

Complete the following procedures to pack a pedestal for shipping:

### **CAUTION**

---

To prevent damage to the pedestal, you must use the approved packing materials and pack the pedestal as described in this procedure

---

1. Place the components in the plastic bags.
2. Remove the packing material from the shipping container.
3. Open the shipping container and orient it as shown in Figure 2–2.
4. Remove the door and all external cables from the pedestal.
5. Place the two bottom foam blocks on the shipping container .lid
6. Insert the pedestal in the bottom foam blocks.
7. Insert the door into its shipping sleeve.
8. Insert the door into the foam blocks.
9. Place the top foam blocks on top of the pedestal and door.
10. Place the cardboard tray on top of the foam block.
11. Slide the pedestal and shipping materials into the carton.
12. Seal the carton.

## 2.5 Preparing the Pedestal for Operation

Preparing the pedestal for operation involves the following procedures:

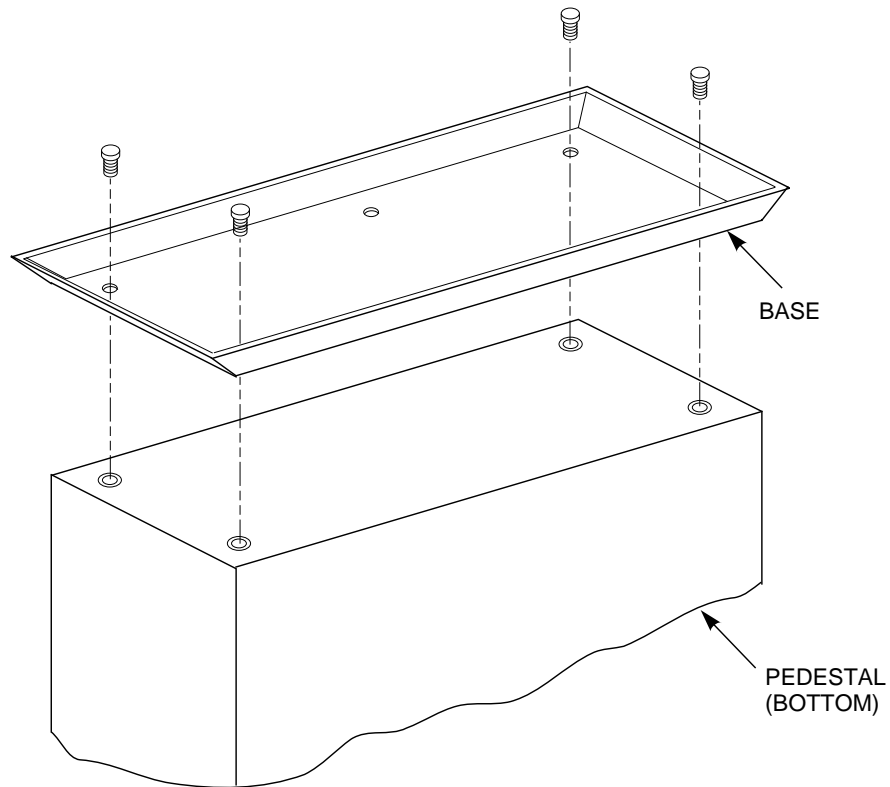
- Mounting the base (BA35X–VB option)
- Installing options (BA35X–AA, BA35X–AB)
- Configuring the pedestal (optional)
- Installing the storage devices
- Connecting the power and SCSI bus cables
- Checking the pedestal and its components for proper operation
- Mounting the door

## 2.6 Mounting the Base

Complete the following procedure to mount the base (BA35X–VB option):

1. Place the pedestal on its top.
2. Align the base with bottom of the pedestal (see Figure 2–3).
3. Install the four, hex-head 6-32 screws through the base into the pedestal.
4. Set the pedestal on the base and continue the installation process.

**Figure 2–3 Mounting the Base**



CXO-4632A-MC

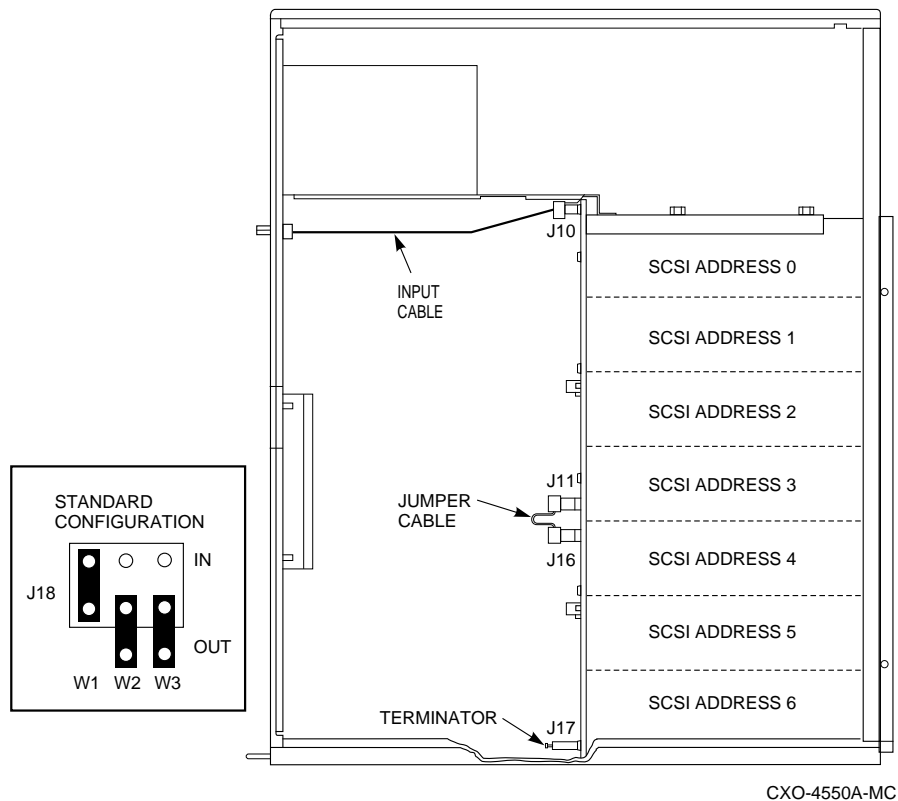
## 2.7 Installing Options

Complete the procedures described in the individual option installation guides.

## 2.8 Configuring the Pedestal

The pedestal is factory-configured as a single SCSI bus with the device addresses shown in Figure 2-4. You can use the procedures in Chapter 3 to change the configuration.

**Figure 2-4 Standard BA346-KB Configuration**



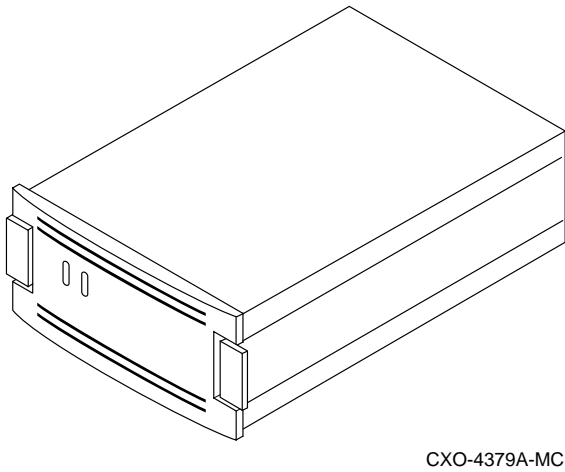
## 2.9 Installing SBBs

After installing the options and configuring the pedestal, you can install the SBBs. Be sure that you have set the storage device addresses *before* installing the devices in the pedestal.

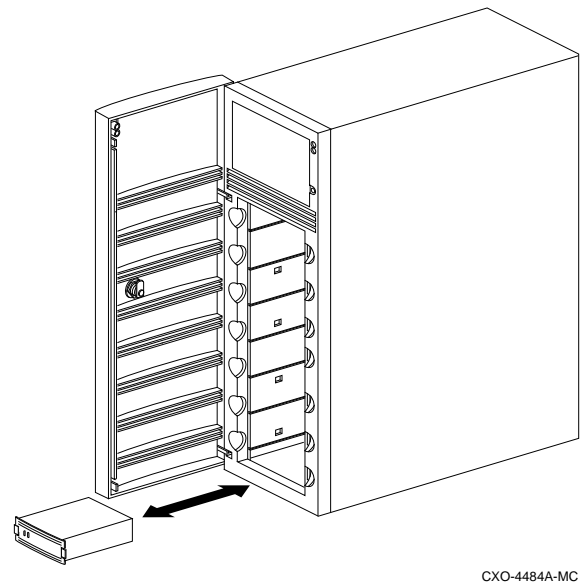
The combinations of the SBB guides, shelf slots, and backplane connectors preclude installing an SBB incorrectly; you can insert an SBB only one way. Each 3.5-inch SBB occupies one shelf slot.

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

**Figure 2–5 3.5-Inch SBB**



**Figure 2–6 Installing an SBB**



## 2.10 Connecting the SCSI Bus Cables

Once you have installed all the storage devices, you can connect the SCSI bus cable.

### CAUTION

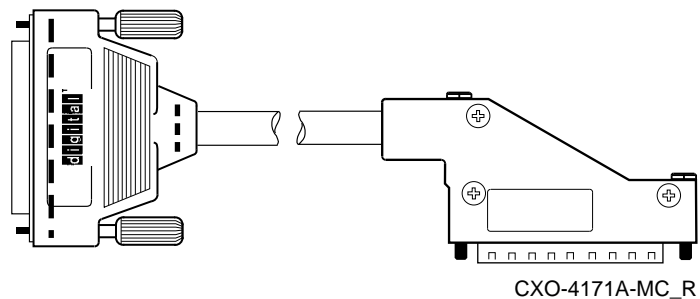
---

Connecting the SCSI bus cable with power applied to either the controller or the pedestal can generate erroneous signals and cause the SCSI bus to “hang.” Always turn off the power on both the host and the pedestal when connecting or disconnecting the SCSI cables.

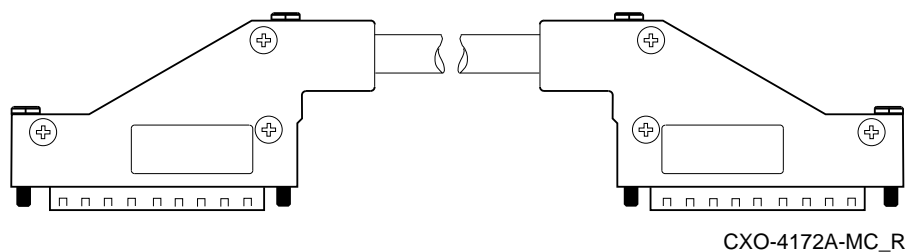
---

The cables recommended for connecting the SCSI controller are either a BN21K or BN21L series SCSI cable. The 68-pin, high-density connector (see Figure 2–7) connects to the SCSI “Bus A” input connector on the rear panel of the pedestal (see Figure 2–9).

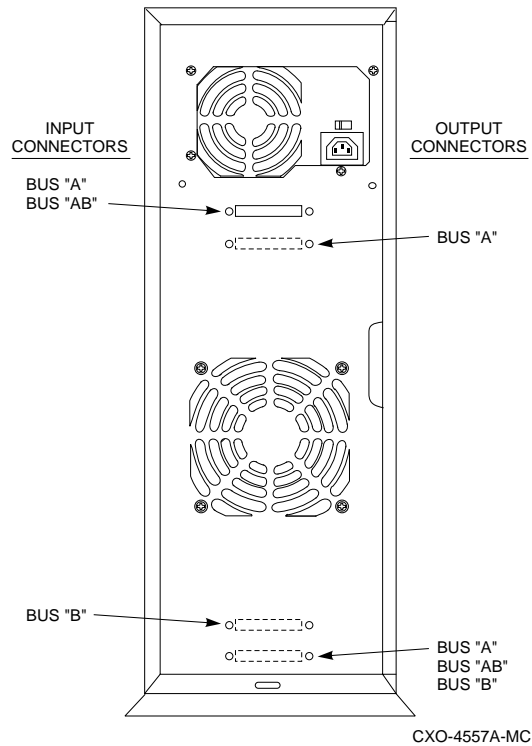
**Figure 2–7 BN21K-Series Cable Connectors**



**Figure 2–8 BN21L-Series Cable Connectors**



**Figure 2–9 Rear Panel Connectors**

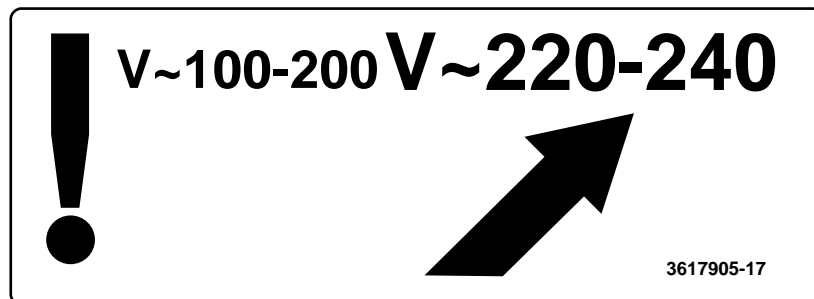


## 2.11 Connecting the AC Power Cord

Complete the following steps to connect the ac power cord:

1. Read the label covering the ac input connector.
2. Remove the label.
3. Set the ac input selector switch to the correct operating voltage (115 V ac or 230 V ac).
4. Connect the ac power cord to the pedestal connector.
5. Connect the ac power cord to the wall receptacle.

**Figure 2–10 Power Supply Label**



CXO-4551A-MC

## 2.12 Operating the Pedestal

Use the pedestal power switch, a “push-to-make, push-to-break” type, to turn on the pedestal. The pedestal power switch is shown in Figure 2–11.

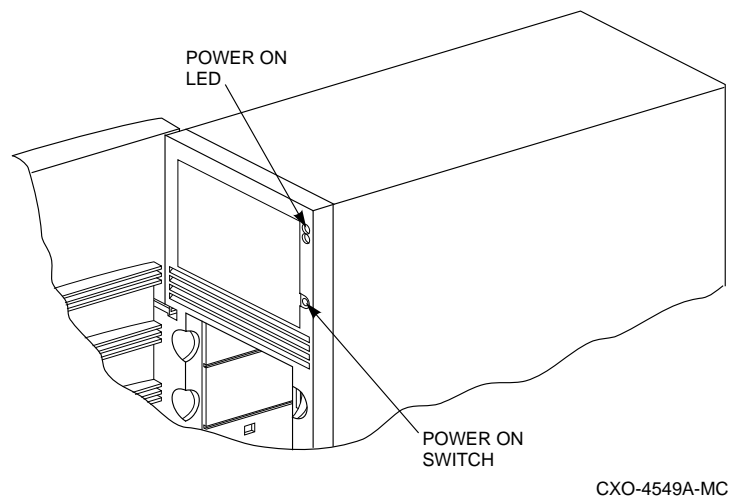
When the ac power is on the green pedestal power LED is on (see Figure 2–11).

When the SCSI bus is active the LEDs on the 5.25-inch devices and the SBBs indicate the status of the storage devices.

For a detailed description of the SBB status LEDs, please refer to the *SBB User’s Guide*.

The individual 5.25-inch device users guides describes the function and purpose of the status LEDs.

**Figure 2–11 Pedestal Power On LED**

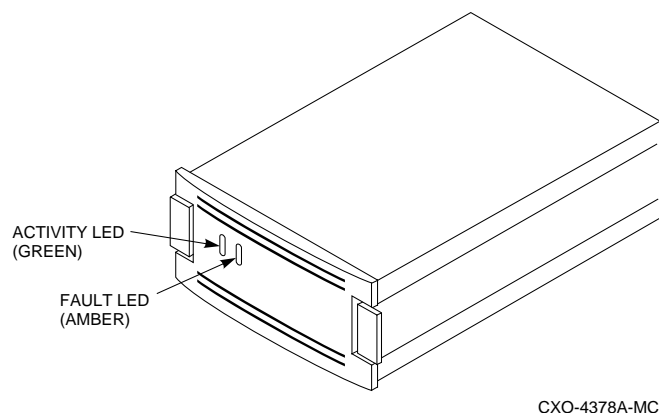


As shown in Figure 2–12, the SBBs have two status LEDs—a green activity LED and an amber fault LED.

Usually the green activity LED is flashing and the amber fault LED is off.

When there is a storage device SBB error indication, complete the procedures in Section 2.14.

**Figure 2–12 Storage SBB Status LEDs**

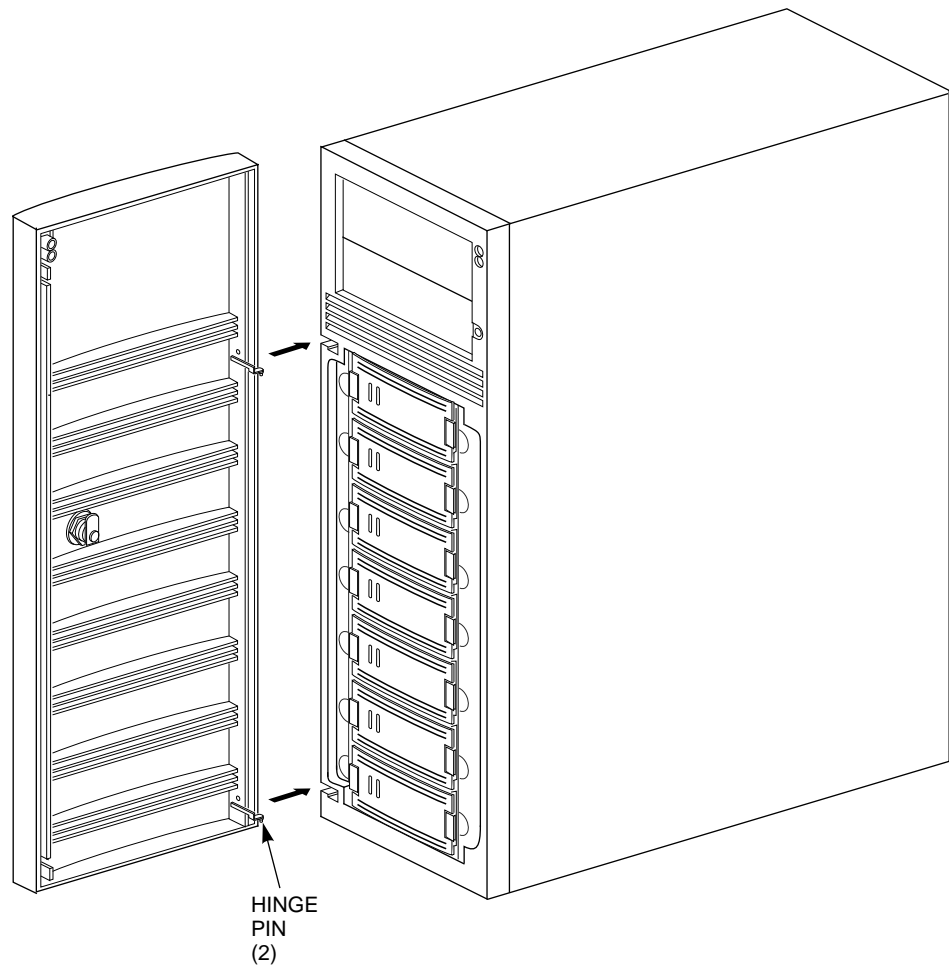




## 2.13 Mounting the Door

Once the pedestal is operating you can install the door to provide security for the storage devices. (A locked door precludes removing storage devices.) Figure 2–13 shows how to mount the door by inserting the hinge pins on the door into the holes in the bezel.

**Figure 2–13 Mounting the Door**



CXO-4554A-MC

## 2.14 Replacing a Storage SBB

There are three methods for replacing a storage SBB with an *identical* SBB:

- **Hot swap**—This method requires that the SCSI controller support removing and installing SBBs while the bus is active. Check the controller documentation to determine if hot swap is supported.

### CAUTION

---

The capabilities of the SCSI controller determine the procedure for removing or installing SBBs. 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.

---

- **Warm swap**—This method requires a that the SCSI controller makes one bus inactive (quiescent) while the other buses remain active. HSJ40-series controllers have this capability.
- **Cold swap**—This method requires removing power from the pedestal to deactivate the bus.

Refer to Figure 2–6 and complete the following procedures to replace an SBB.

1. Open the front door.
2. When the bus is inactive, press the mounting tabs on the SBB bezel together and pull the SBB out, as shown in Figure 2–6.
3. Insert an *identical model* SBB in the slot and push it in to fully seat it. Allow the front panel mounting tabs expand and engage the shelf.
4. Activate the SCSI bus and observe that the SBB status LEDs are operating.
5. Close the front door.

## Configuring the Pedestal

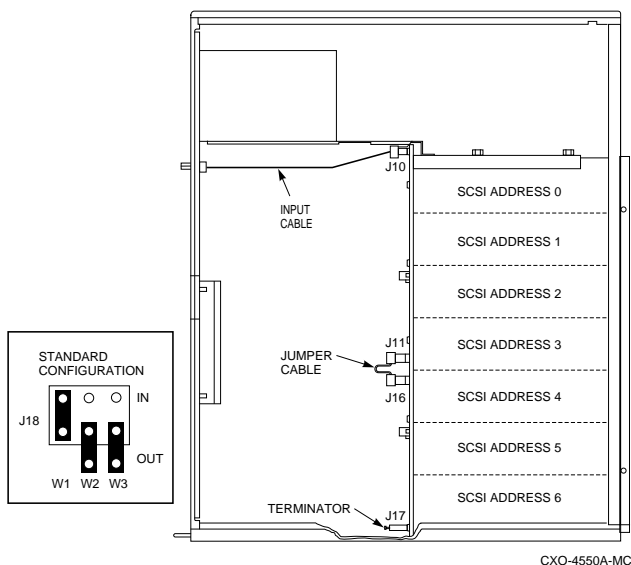
This chapter describes the standard BA346–KB pedestal configuration and how to change it.

### 3.1 The Standard Configuration

You can install the dual bus and the 5.25-inch device option at any time. Installing either option requires changing the pedestal configuration. Digital recommends that you install the options during the initial installation. See the individual option installation guides for detailed option installation procedures.

The standard configuration shown in Figure 3–1 and described in and is factory-installed.

**Figure 3–1 Standard (Shipping) Configuration**



**Table 3–1 Standard Configuration Specifications**

<b>Backplane Bus Type</b>	Single
<b>Device Addresses</b>	8-bit devices: 0-6 16-bit devices: 0-6 5.25-inch devices: None
<b>SCSI Bus</b>	Cables and Terminators: <ul style="list-style-type: none"> <li>● Input Cable (Rear panel to J10)</li> <li>● Jumper Cable (J11 to J16)</li> <li>● Terminator (J17)</li> </ul>
<b>Internal SCSI Bus Length</b>	0.97 meters (38 in)

## 3.2 SCSI Bus Cables and Accessories

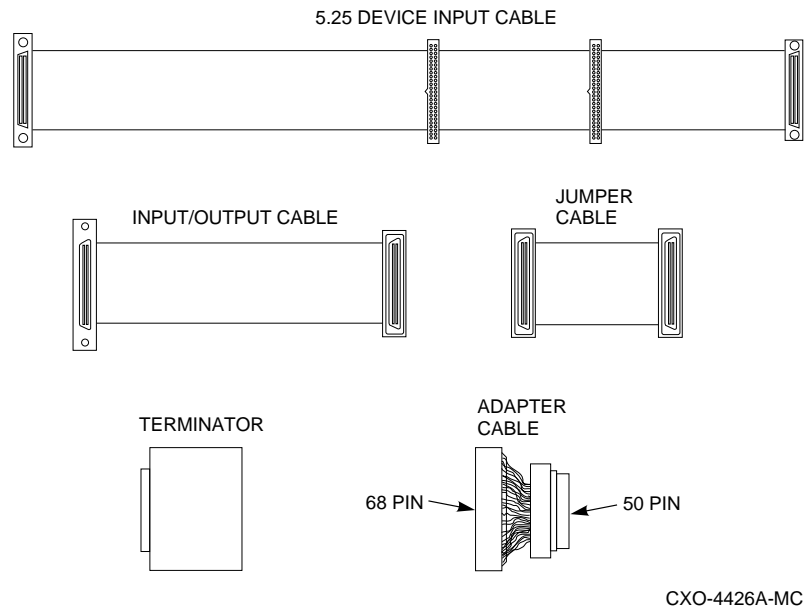
After installing the options, there are two parts to configuring a pedestal—connecting the internal cables and setting the configuration address. Most cabling configurations and all SCSI address configurations are compatible. However, be sure to check Table 3–5 (page 3–7) for a description of each configuration.

As shown in Table 3–2 and Figure 3–2, the SCSI bus accessories include a terminator and cables.

**Table 3–2 SCSI Bus Accessories**

Item	Quantity per Model		
	BA346–KB (Standard)	BA35X-AA 5.25-Inch Option	BA35X -AB Dual Bus Option
Cable, Adapter, 68-pin to 50-pin	0	2	0
Cable, Input 5.25-inch device	0	1	0
Cable, Input/Output	1	0	3
Cable, Jumper	1	0	0
Terminator	1	0	1

**Figure 3–2 SCSI Cables and Accessories**



### 3.3 SCSI Buses

The reliability of data transfers on a SCSI bus is a function of the following:

- The bus transmission rate
- The bus type (8-bit or 16-bit)
- The maximum SCSI bus length (a function of the bus type, the transmission rate, and the use of SCSI bus converters)
- The total length of the SCSI bus (as measured from the host bus terminator to the pedestal terminator)

Table 3–3 lists the maximum SCSI bus lengths and the recommended SCSI bus cables.

**Table 3–3 SCSI Buses and Cables**

Bus Type			Transfer Rate		Bus Length		Recommended Cable		
Width	Type	Controller Termination	MT/s <sup>†</sup>	MB/s	Meters	Feet	Order Number	Meters	Feet
8-bit	Fast	Differential	10	10	25	82	BN21K–23 BN21L–23	23	82
8-bit	Fast	Single-ended	10	10	3	9.8	BN21K–02 BN21L–02	2	6.6
8-bit	Slow	Single-ended	5	5	6	19.7	BN21K–05 BN21L–05	5	16
16-bit	Fast	Differential <sup>‡</sup>	10	20	25	82	BN21K–23 BN21L–23	23	82
16-bit	Fast	Single-ended	10	20	3	9.8	BN21K–02 BN21L–02	2	6.6

#### Note

MT/s (megatransfers per second) is the repetitive rate at which words of data are transferred across a bus. The number of megabytes per second (MB/s) is determined by the bus width (8-, 16-, or 32-bit) and the number of bytes per word (1, 2, or 4, respectively).

<sup>†</sup> Megatransfers per second

<sup>‡</sup> BA346–DB deskside expansion pedestal.

### 3.4 Internal SCSI Buses

Figure 3–3 shows the three internal SCSI bus configurations. Digital recommends that the internal SCSI bus length be kept as short as possible.

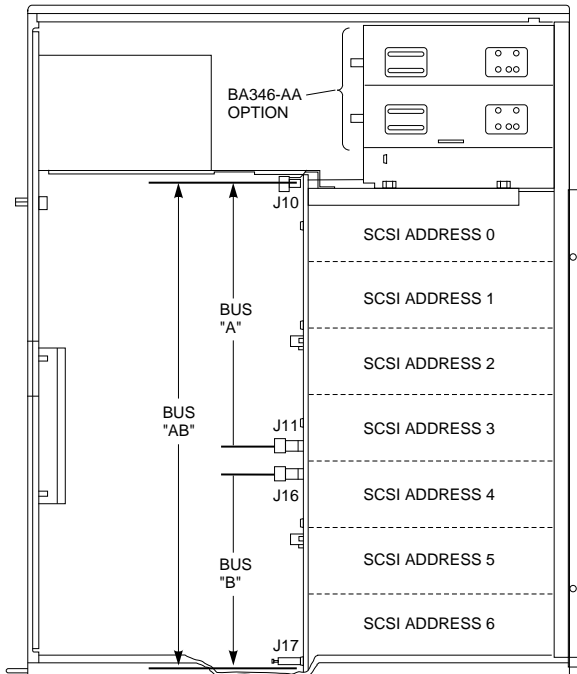
The total internal SCSI bus cable length is distance from the controller terminator to the pedestal terminator. To calculate this distance, add the following elements:

- The distance from the controller terminator to the controller output connector
- The pedestal input cable length (rear panel to connector J10)
- The pedestal backplane SCSI bus length (either “A,” “B,” or “AB”) from either J10 or J16 to the terminator (see Table 3–4).

**Table 3–4 Determining SCSI Bus Lengths**

SCSI Bus Element	Bus	From	To	Length	
				Meters	Inches
Upper Backplane	A	J10	J11	0.41	16.0
Lower Backplane	B	J16	J17	0.25	10.0
Backplane	AB	J10	J17	0.73	28.8
Cable, Input/Output				0.30	12.0
Cable, Jumper				0.07	2.8
Output Cable				0.30	12.0
<b>BA35X-AA 5.25-Inch Device Option Kit</b>					
Cable, Input 5.25-inch device				0.64	25.0
Cable, Adapter, 68-pin to 50-pin				0.05	2.0

**Figure 3–3 BA346-KB SCSI Bus Lengths**



CXO-4477A-MC

#### CAUTION

The recommended cable lengths are when the *total* internal SCSI is less than 1 meter (39 inches) for both the controller and pedestal.

If the total internal bus length exceed 1 meter (see Section 3.4), you must use a shorter cable for proper SCSI bus operation.

## 3.5 Removing the Side Panel

Whenever you configure the pedestal, you must complete the following procedures:

1. Turn off the power to both the controller and the pedestal.
2. Disconnect the pedestal power cord.
3. Disconnect the external SCSI bus cables.
4. Remove the front door by lifting it up and off the bezel.
5. Remove the left side cover screws (see Figure 3-4).
6. Grasp the side cover rear hand hold (see Figure 3-5) and pull the cover to the rear and remove.

Figure 3-4 Removing the Side Cover

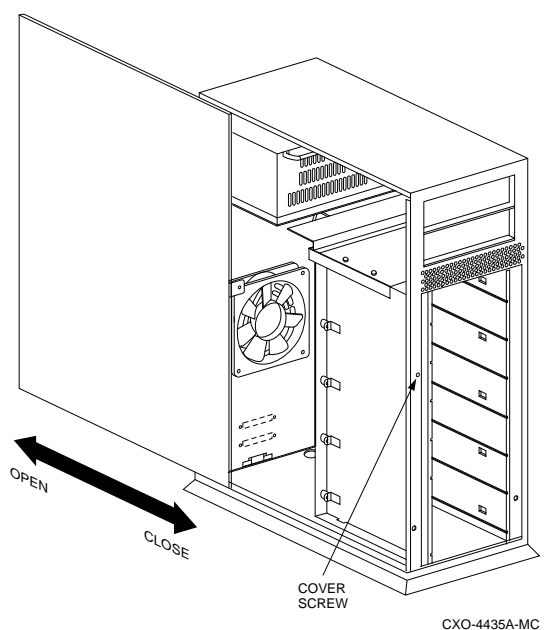
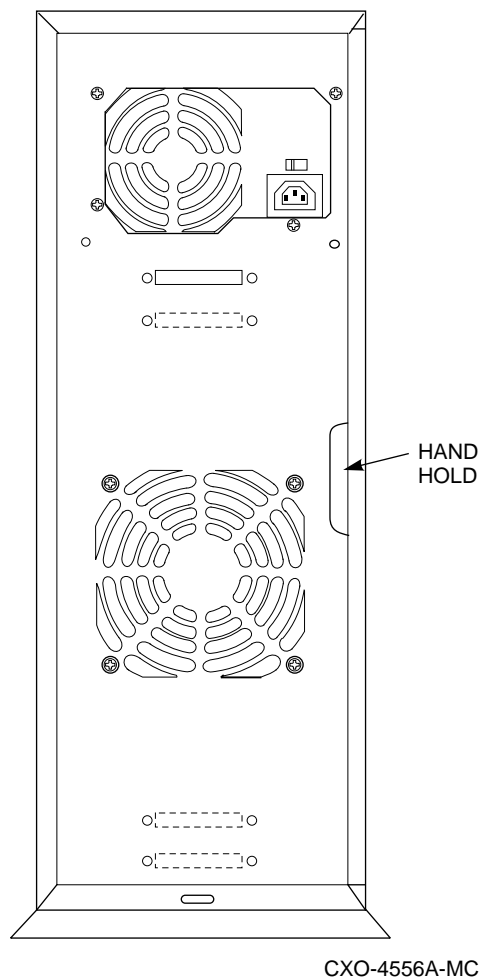


Figure 3-5 Side Cover Hand Hold



### 3.6 Setting the Configuration Address

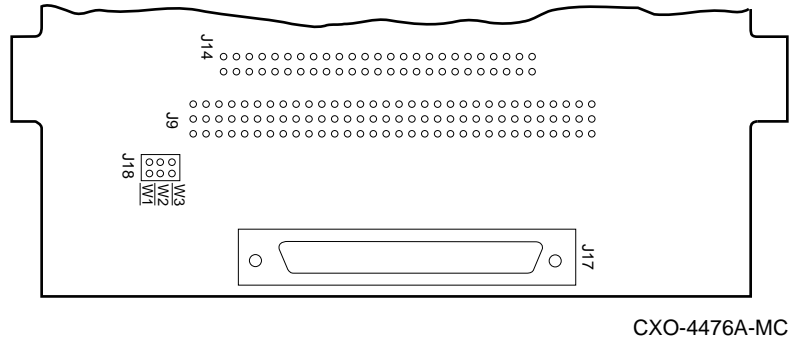
There are both configuration addresses and device addresses. Jumpers W1-W3 determine the eight configuration addresses that can be used for both 8-bit (addresses 0-6) and 16-bit (addresses 0-6 and 8-14) devices.

**Note**

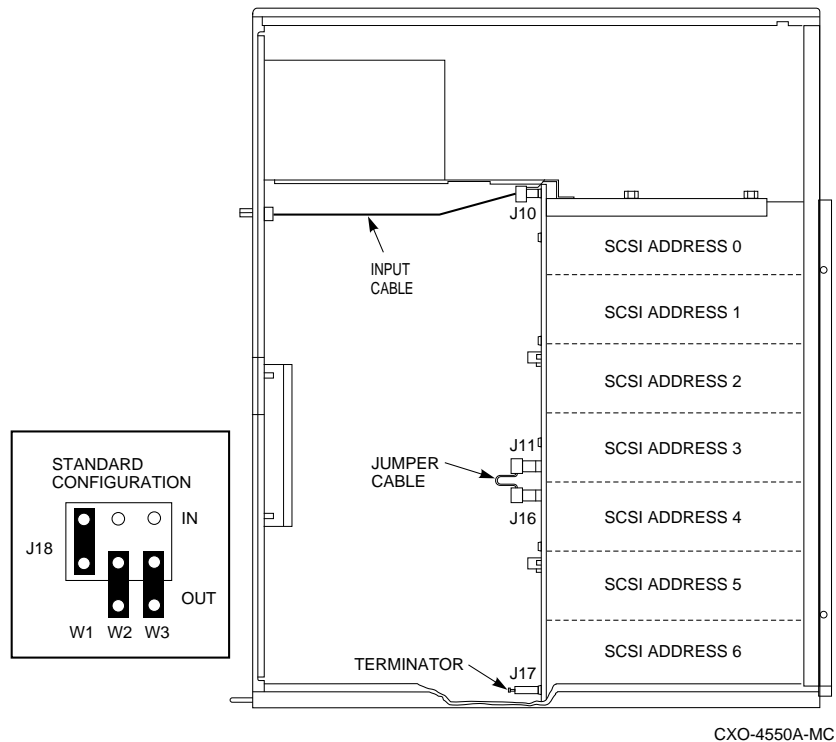
SCSI device address 7 is the SCSI controller address.

Use jumpers W1-W3 to set the address configurations. Figure 3-6 shows the location of connector J18 and the jumpers. Table 3-5 defines the slot addresses assigned for each of the eight address configurations. Figure 3-7 shows the standard configuration cabling.

**Figure 3-6 Address Configuration Jumpers**



**Figure 3-7 BA346-KB Standard Configuration**






**Table 3–5 Standard Configuration Addresses and Slot Addresses**

Configuration 1 (Dual Bus only)		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	0	1	2	3	0	1	2
Configuration 2 Standard Configuration		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	0	1	2	3	4	5	6
Configuration 3		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	8	9	10	11	0	1	2
Configuration 4		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	8	9	10	11	4	5	6
Configuration 5		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	0	1	2	3	8	9	10
Configuration 6		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	0	1	2	3	12	13	14
Configuration 7 (Dual Bus only)		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	8	9	10	11	8	9	10
Configuration 8		SCSI Addresses	Slot	0	1	2	3	4	5	6
			Address	8	9	10	11	12	13	14

**LEGEND:**

 16-bit devices only.

## 3.7 Device Addresses

You can assign the device SCSI bus addresses in the following ways:

- Jumpers on the device
- Device address switches on 8-bit removable media SBBs as described in the *SBB User's Guide*
- Using the slot connector address as determined by the jumpers (see Section 3.6)

The basic rules for setting devices are:

- 16-bit devices *always* use the slot address
- 8-bit, 5.25-inch devices *always* use the internal jumpers
- 8-bit, 3.5-inch SBB disk drives *always* use the slot address

The following are options for an 8-bit removable media SBB with an address switch (refer to the *SBB User's Guide*).

- To use the slot address set the device address switch to the default setting.
- *Duplicate device addresses* on a single, 8-bit SCSI bus require you to set the device address switch to an unused 8-bit device address.

## 3.8 Completing the Configuration

Perform the following procedure to complete the configuration and check the pedestal operation.

1. Replace the side cover.

### CAUTION

---

Install the side cover before turning the power on.

---

2. Install the SBBs in the lower portion of the pedestal.
3. Connect the external SCSI cable and the ac power cord.
4. Turn on the pedestal and check that the pedestal is operating properly and that the devices respond when the SCSI bus is active.

---

# Glossary

**cold swap**

A method of device replacement that requires that power be removed from all shelves in a cabinet. Use this method when you cannot use warm swap or hot swap methods. See also *warm-swap* and *hot-swap*.

**controller**

A hardware and 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.

**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.

**host computer**

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

**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*.

**megabytes per second (MB/s)**

See *megatransfers per second*.

**megatransfers per second (MT/s)**

The repetitive rate at which words of data are transferred across a bus. The number of megabytes per second (MB/s) is determined the bus width (8-, 16-, or 32-bit). For example, a 5 MT/s transfer rate is the equivalent of:

Bus Width	8-bit	16-bit	32-bit
Word Size	1 Byte	2 Bytes	4 Bytes
5 MT/s =	5 MB/s	10 MB/s	20 MB/s

**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.

**pedestal**

An enclosure, commonly referred to as a pedestal, that houses a StorageWorks shelf in a vertical position. This pedestal contains the power supply and a cooling fan. The user supplies the storage SBBs and an ac power cord. The SBB types and the SCSI controller determine the number of devices, the SCSI buses supported, and the pedestal location.

**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.

**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.

**SCSI address**

The decimal representation of the unique address assigned to a SCSI device, for example, SCSI address 6.

**SCSI id**

The bit-significant representation of the unique address assigned to a SCSI device, for example, SCSI id 011.

**single-ended SCSI bus**

A bus in which the voltage of a single wire in relation to ground determines each signal's logic level.

**small computer system interface**

See *SCSI*.

**split bus**

Configuring a single SBB shelf SCSI bus as two individual buses (a four device bus and a three device bus) creates a split bus.

**spin-down**

Removing power and halting data transfer starts the spin-down process. When the device is no longer rotating and you can move the device, the spin-down is complete. In the case of disk drives, the heads are retract and the media stops rotating.

**spin-up**

Applying power initiates the spin-up process. When the device is operational and ready for data transfer operations spin-up is complete.

**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 supplies, 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*.

**target id**

See *SCSI id*.

**warm swap**

Adding, removing, or replacing devices while the system remains operational is a controller function. It is necessary to halt all activity on the device's SCSI bus for the duration of the warm swap operation.

See also *cold-swap* and *hot-swap*.

**word**

This term indicates the size of a data construct. The bus width determines the number of bytes in a word, for example:

<u>Bus Width</u>	<u>Word Length</u>
8-bit	1 byte
16-bit	2 bytes
32-bit	4 bytes



---

# Index

## —5—

5.25-inch device option, 1–2

## —A—

### Addresses

16-bit devices, 3–8  
8-bit devices, 3–8  
configuration, 3–2  
configuration jumpers, 3–6  
device, 3–2, 3–6, 3–8  
duplicate device  
  addresses, 3–8  
  jumpers, 3–8  
  slot, 3–6

Air flow, 1–6, 1–8, 2–1, 2–2  
  specifications, 1–8

Audience, v

## —B—

BA346–KB, 1–1, 3–2  
  components, 1–3  
  factory configuration, 2–6  
  shipping configuration, 2–6  
  standard configuration, 2–6

BA35X–AA, 1–2, 1–7, 3–2  
  installing, 2–5

BA35X–AB, 1–2  
  installing, 2–5

BA35X–VB, 1–2  
  mounting, 2–5

BA35X–YA, 1–2

Base, 1–2  
  mounting, 2–5

BN21K, 2–8

BN21L

SCSI cable, 2–8

## —C—

### Cables

BN21K cable, 2–8

BN21L, 2–8

  connecting, 2–5

  connecting SCSI bus, 2–8

  power, 2–5

  SCSI bus, 2–5

  SCSI bus BN21K, 2–8

  SCSI bus BN21L, 2–8

  SCSI bus input/output, 3–1

  SCSI bus jumper, 3–1

CAUTIONs, 1–6, 2–1, 2–2, 2–4, 2–8, 2–12, 3–8

Cold swap, 2–12

Configuration address  
  jumpers, 3–6

Configuring, 2–5, 2–6

### Connector

68-pin, 2–8

high-density, 2–8

### Cooling, 1–6

  fans, 1–6

  power supply, 1–6

  storage devices, 1–6

## —D—

Device addresses. *See* SCSI bus

### Door

  lock, 2–11

  mounting, 2–5, 2–11

## —H—

Hot swap, 2–12

## —I—

Input voltage, 2–9

Installing a pedestal, 2–1

## —L—

### LEDs

  5.25-inch device status, 2–10

  amber, 2–10

  device activity, 2–10

  fault, 2–10

  green, 2–10

  power, 2–10

  SBB status, 2–10

  status, 2–10

## —O—

Operating a pedestal, 2–1

### Options, 3–2

  5.25-inch device, 1–2, 3–1

  base, 1–2

  dual bus, 1–2, 3–1

  factory configuration, 1–2

  installing, 2–5, 2–6, 3–2

  stability, 1–2

## —P—

Packing, 2–4

### Pedestal, 1–1

  assembling, 2–1

  changing configuration, 3–1

  configuration addresses, 3–2

  configuring, 2–5, 2–6, 3–1, 3–5

  deskside expansion, 1–1

  dimensions, 2–1

- factory configuration, 2-6, 3-1
- installation, 3-8
- installation area, 2-2
- installing, 2-1
- location, 2-1
- operating, 2-1, 2-5
- operation, 2-5, 3-8
- packing, 2-4
- power LED, 2-10
- power switch, 2-10
- shipping, 2-2
- shipping configuration, 3-1
- slot addresses, 2-7
- slots, 2-7
- standard configuration, 3-1
- status LEDs, 2-10
- unpacking, 2-2
- Power, 1-4
  - ac input, 1-4, 2-2
  - ac power cords, 1-5
  - ac power supply, 1-4
  - ac power supply specifications, 1-4
  - connecting, 2-9
  - cord, 2-9
  - input voltage, 2-9
  - switch, 2-10

## —S—

- SBBs, 1-7
  - 3.5 inch slots, 2-7
  - 5.25-inch, 1-7
  - installing, 2-5, 2-7
  - protecting, 2-11
  - replacing, 2-12
  - status, 2-10
  - storage device status, 2-10
- SCSI

- bus, 2-6
  - device addresses, 3-2
- SCSI bus
  - 16-bit, 3-3
  - 8-bit, 3-3
  - accessories, 3-2
  - active, 2-12
  - BN21K cables, 3-3
  - BN21L cables, 3-3
  - cables, 2-8, 3-2, 3-3
  - calculating internal bus length, 3-4
  - controller, 3-3
  - controller termination, 3-3
  - device address jumpers, 3-8
  - device address switches, 3-8
  - device addresses, 2-6, 2-7, 3-8
  - differential, 3-3
  - fast, 3-3
  - inactive, 2-12
  - input/output cables, 3-1
  - internal, 3-4
  - internal bus "A", 3-4
  - internal bus "AB", 3-4
  - internal bus "B", 3-4
  - internal cables, 3-2
  - length, 2-2
  - maximum length, 3-3
  - megabytes/second, 3-3
  - megatransfers/second, 3-3
  - quiescent, 2-12
  - single-ended, 3-3
  - slow, 3-3
  - terminator, 3-2
  - terminators, 3-1
  - total length, 3-3
  - transmission rate, 3-3

- type, 3-3
- SCSI bus "A", 2-8
- SCSI controller, 1-7, 2-2
  - support, 1-7
  - swapping SBBs, 2-12
- Side panel
  - removing, 3-5
- Specifications
  - ac power, 1-4
  - air flow, 1-8
  - BA346-KB, 1-8
  - backplane bus type, 3-1
  - device addresses, 3-1
  - dimensions, 1-8
  - internal SCSI bus length, 3-1
  - physical, 1-8
  - power, 1-8
  - product, 1-8
  - single bus, 3-1
  - standard configuration, 3-1
- Standard configuration, 2-6
- Storage devices
  - 3.5-inch, 1-7
  - installing, 2-5
- StorageWorks building blocks. *See* SBBs
- Swapping SBBs, 2-12
  - cold swap, 2-12
  - hot swap, 2-12
  - SCSI controller, 2-12
  - warm swap, 2-12

## —U—

- Unpacking, 2-2

## —W—

- Warm swap, 2-12
- WARNINGS, 2-2, 2-4