



DIGITAL StorageWorks SCSI Controller Shelf Upgrade/Add-On Kits Installation Guide

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This publication describes the DS-BA356-MD Series array controller shelf installation procedures. The first portion of this publication addresses shelf upgrade kit procedures and the last portion addresses shelf add-on kit procedures.

**Digital Equipment Corporation
Maynard, Massachusetts**

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- 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.

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Preface

The *DIGITAL StorageWorks SCSI Controller Shelf Installation Guide* describes the replacement of an older model shelf and the installation of an add-on controller shelf.

Intended Audience

This publication is for use by DIGITAL™ StorageWorks™ small computer system interface (SCSI) controller shelf customers and employees who are responsible for installing, replacing, and configuring controller shelves and their components.

Structure

This manual is organized as follows:

Chapter 1—Introduction

Presents the critical issues that must be addressed: replacing shelves, unpacking the shelves, the required tools, and general information.

Chapter 2—Removing a Controller Shelf

Describes the processes for removing an existing shelf and applies only to upgrade kits.

Chapter 3—Installing a Replacement Shelf

Describes the procedures for installing a replacement shelf and applies only to upgrade kits.

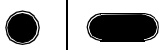
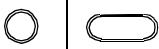
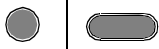




Chapter 4—Installing an Add-On Controller Shelf

Describes the steps required to install an add-on controller shelf.

Documentation Conventions

The documentation conventions used in this publication are shown in Table 1.

Table 1 Documentation Conventions

boldface type	Boldface type indicates the first instance of terms being defined in the text, the glossary, or both.
<i>italic type</i>	Italic type indicates emphasis and publication titles.
A/R	As required.
	The light emitting diode (LED) is ON or blinking slowly.
	The LED is OFF .
	The LED is FLASHING (blinking rapidly).
	Warning The information is essential to the safety of personnel.
	Caution The information is essential in order to avoid damaging the software or hardware.
Note	Notes contain information that might be of special interest to the user.
	Single-ended SCSI bus.
	Differential SCSI bus.

Related Documents

Table 2 identifies publications that contain additional information relevant to DS-BA356-MD SCSI controller shelves.

Table 2 Relevant Publications

Publication Title	Part Number
<i>SCSI Controller Shelf Upgrade/Add-On Kits Check List</i>	EK-356M1-RM
<i>SCSI Controller Shelf Upgrade/Add-On Kits User's Guide</i>	EK-356MA-UG
<i>16-Bit SBB User's Guide</i>	EK-SBB16-UG
<i>SBB Shelf I/O Module User's Guide</i>	EK-SBBIO-UG
<i>SW500 and SW800 Cabinet Metric Shelf Bracket Kit Installation Guide</i>	EK-35XRD-IG
<i>Using Your Controller in a BA356 Controller Shelf</i>	EK-HSMXM1-CG
<i>HSZ70 Array Controller HSOF CLI Reference Manual</i>	EK-CLI70-RM
<i>HSZ70 Array Controller Configuration Manual</i>	EK-HSZ70-CG
<i>HSZ70 Array Controller Service Manual</i>	EK-HSZ70-SV
<i>HSZ70 Family Array Controller Operating Software (HSOF) Software Product Description</i>	SPD 64.81.00
<i>Array Controller HSZ70 Operating Software HSOF Release Notes</i>	EK-HSZ70-RN
<i>Getting Started-HSZ70 Solutions Software for ... platform</i>	AA-R60xx-TE
<i>Polycenter Console Manager</i>	See the <i>Getting Started</i> guide listed above for the platform-specific order number.
<i>Getting Started with Command Console</i>	AA-R0HJC-TE
<i>The RAIDBOOK—A Source for RAID Technology</i>	RAID Advisory Board

Introduction

This chapter contains information regarding the tools and materials required to remove and install DIGITAL StorageWorks DS-BA356-MD controller shelves. It also identifies controller shelf orientations and information relevant to unpacking controller shelf shipping boxes.

Required Tools and Equipment

Table 1-1 identifies the tools and equipment required for removal and installation of controller shelves.

Table 1-1 Tools & Equipment

Required Items
Diagonal cutters
Needle-nosed pliers
5/16-inch Nut driver
Straight-slot screwdriver
#2 Phillips screwdriver
Electrostatic Discharge (ESD) mat
ESD wrist strap
Knife or cutting tool

Inventory List

Table 1-2 lists the controller shelf components required to install the DS-SWXM1-AA or DS-SWXM1-BA as an upgrade or add-on kit. Table 1-3 lists the controller shelf components required to install the DS-BA356-MD as an add-on kit. Table 1-4 lists user special order components.

Table 1-2 SCSI Controller Shelf Upgrade/Add-On Kits Components

Model Number	Description	DS-SWXM1	
		-AA	-BA
DS-BA356-MD	Controller shelf (see Table 1-3)	1	1
DS-HSZ70-AH	StorageWorks Input/Output (I/O) Controller with: 64 MB cache memory ECB cable installation kit	1	2
DS-HS35X-BC	Single ECB	1	0
DS-HS35X-BD	Dual ECB	0	1

Table 1-3 SCSI Controller Shelf Add-On Kit (DS-BA356-MD) Components

Description	Qty
DS-BA356-MD controller shelf with: 150 W power supplies (BA35X-HF)	1 2
Blower assembly (BA35X-MQ)	2
50-conductor 2m (6.6 feet) cable (BN21H-02)	1
Cache module blank panel	1
Controller module blank panel	1
Metric shelf bracket, screw mounting (74-46442-01) and Screws (10-32 x 0.625 inch)	2 12

Description	Qty
Metric shelf mounting kit (BA35X-RD) with:	1
Tab mounting bracket (74-47506-01)	2
Kep nuts	8
Locking bracket, front shelf (74-46441-02)	2
Locking bracket, rear shelf (74-46441-01)	2
Stop bracket (74-46439-01)	2
Stop bracket screws	2

Note

The components listed in Table 1-4 are only required for use with the DS-BA356-MD SCSI controller shelf add-on kit.

Table 1-4 User Ordered SCSI Controller Shelf Components

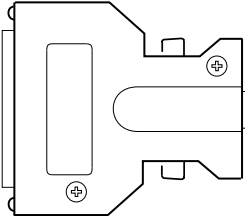
Description	Qty	Model
DIGITAL array controller with cache memory	A/R	Contact your account representative
Single ECB	1 per cache	DS-HS35X-BC
Dual ECB	1 per 2 caches	DS-HS35X-BD
ECB cable	1 per cache	Contact your account representative
Fast 10 SCSI cables	A/R	BN21H series
ECB shelf	A/R	DS-BA35X-BA
Operating system specific platform kit	1 per controller	Contact your account representative

Introduction

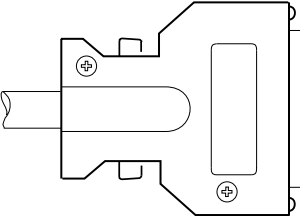
Table 1-5 provides a description of the SCSI cable that might be included in the shelf package purchased.

Table 1-5 BN21H Series Single-Ended 50-Conductor Cables

Cable Description	Length		Order Number
	Meters	Feet	
50-conductor cable with: 2 each, 50-pin, high-density, male, straight connector with thumb latches	0.3	1.0	BN21H-0C
	0.5	1.6	BN21H-0E
	1.0	3.3	BN21H-01
	1.5	4.9	BN21H-1E
	2.0	6.6	BN21H-02



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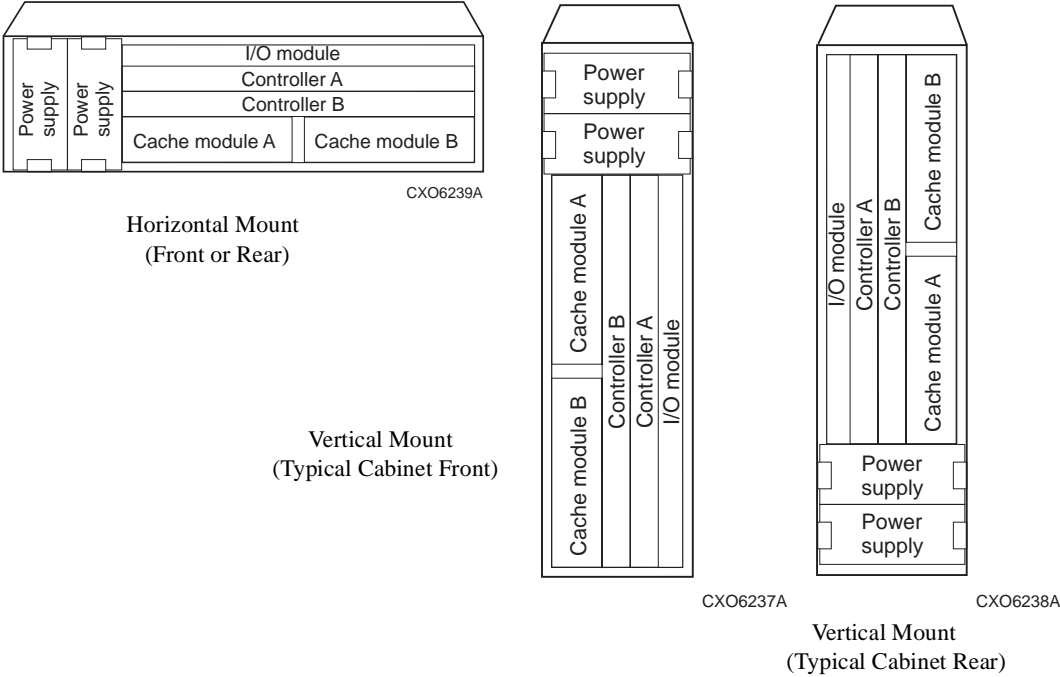
Controller Shelf Orientation

There are various shelf orientations available:

- Shelves can be mounted horizontally or vertically in the cabinets. The current cabinet configuration determines the shelf orientation. When replacing a BA350–M series shelf with a DS–BA356–M series shelf, use the same orientation for the new shelf as for the previous shelf.
- For a horizontal orientation, only tab-mounted brackets are used.
- For a vertical orientation, either tab-mounted or screw-mounted brackets may be used. The type is determined by the cabinet into which the shelf is being mounted.

The three typical shelf-mounting orientations are: horizontal, front-vertical, and rear-vertical. Figure 1-1 depicts each orientation.

Figure 1-1 Controller Shelf Orientations



Unpacking the Box

Complete the following procedure to remove the shelf from the box:

1. Use an ESD-compliant work surface.



Warning

Two people are required to remove the shelf from the box—one person holds the box while the other pulls out the shelf.

Use proper lifting techniques when lifting the shelf. Failure to do so might cause personal injury.

2. One person holds the box securely while the other person removes its contents.
3. Grasp the shelf with both hands, bending at the knees as the shelf is lifted out of the box.
4. When the shelf clears the box, place it on the ESD compliant work surface.

Note

As the components are removed from the packaging, check them against the inventory list.

5. Carefully unwrap the components, ensuring that they are all placed entirely on the ESD-compliant work surface.
6. Remove the controller shelf from the ESD bag, placing the controller shelf on top the bag.
7. Remove the bubble-wrapped mounting brackets and bag of screws, the BA35X-RD box, and the cache and controller cards.

8. Open the BA35X–RD box and check its contents against the parts list in the *SW500 and SW800 Cabinet Metric Shelf Bracket Kit Installation Guide*.

Note

If any parts are missing, contact your account representative.

9. After *all* parts, tools, and materials are accounted for:
 - If you are REPLACING a controller shelf with an upgrade kit, then go to Chapter 2—Removing a Controller Shelf.
 - If you are INSTALLING an add-on controller shelf, then go to Chapter 4—Installing an Add-On Controller Shelf.
10. If necessary, retain packaging for future use in packing old materials.

Caution



Do NOT attempt to install the controller shelf in the cabinet without ensuring the cabinet and new shelf are properly grounded. Ensure you wear an ESD wrist strap that is properly grounded to the cabinet. Otherwise, damage to the controller might occur due to an electrical static discharge.

Removing a Controller Shelf

Chapter 2 applies *only* if you are installing a controller shelf (DS–SWXM1–AA or DS–SWXM1–BA) as an upgrade kit. If installing as an add-on kit, go to Chapter 4.

Chapter 2 covers the removal of your BA350–M controller shelf in preparation for installing the DS–BA356–MD controller shelf as an upgrade kit.

Replacement Check List



Caution

Before you begin to remove a controller shelf, refer to the *SCSI Controller Shelf Upgrade/Add-On Kits Check List* document. This document was initially placed on the outside of the DS–BA356–MD shelf packing box and printed on bright yellow paper stock. It is extremely important to follow this document in the *exact order* as the information is presented. Otherwise, loss of data and damage to might occur.

Do NOT continue with this chapter until *all* of the objectives prior to the removal and installation steps on the *SCSI Controller Shelf Upgrade/Add-On Kits Check List* are complete.

After removing, reading, and accomplishing all the tasks in the *SCSI Controller Shelf Upgrade/Add-On Kits Check List*, proceed with the removal of the controller shelf.

Removing a Controller Shelf

New Shelf Orientation

Shelves can be mounted horizontally or vertically in the cabinets as shown in Chapter 1, Figure 1-1. Your cabinet's current configuration determines the shelf orientation required for this upgrade kit installation.

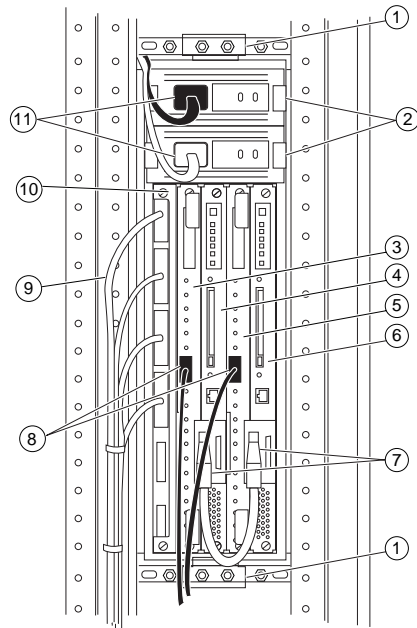
Identifying Shelf Components

Figure 2-1 identifies all the pertinent components of a typical shelf configuration:

- (1) Top and bottom front shelf locking brackets
- (2) Power supplies
- (3) Controller cache module A
- (4) Array controller module A
- (5) Controller cache module B
- (6) Array controller module B
- (7) Host port adapter cables
- (8) ECB cables
- (9) I/O cables
- (10) I/O cable panel
- (11) Power supply cords

Removing a Controller Shelf

Figure 2-1 Typical Shelf Components

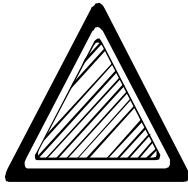


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Removing a Controller Shelf

Preliminary Procedure

Complete the following procedure before removing a controller shelf:



Warning

Do NOT slide hands along cabinet rail edges. The rails are very sharp and might cause personal injury.



Caution

Proper ESD procedures *must* be followed:

- Use an ESD work surface.
 - Wear a properly grounded ESD wrist strap.
 - Place *all* components on the ESD work surface as you remove them from the packaging.
-

1. On the host system, dismount the subsystem disk drives connected to the controllers being replaced.
2. Attach your ESD wrist strap to an unpainted surface on the cabinet, such as a mounting rail.
3. Quiesce all the controller SCSI buses on the controllers being replaced.
4. Remove power from the SBB shelves connected to the controller shelf being replaced.

Power Supplies

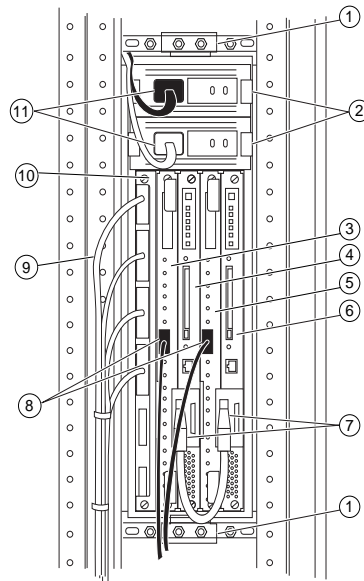
Two power supplies are provided with each SCSI controller shelf upgrade or add-on kit and should be used with the new controller shelf. However, the power supplies from your BA350-M shelf may be used with the DS-BA356-MD controller shelf, provided they are rated at least 150 W, such as the BA35X-HF.

If desired, remove the power supplies from the controller shelf to provide more working room and lighten the weight of the shelf for removal.

Removing the Power Supplies

Removing the power supplies from the BA350-M shelf is a simple process. Refer to Figure 2-2 as necessary while completing the following procedure:

Figure 2-2 Shelf Components



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1. Disconnect the two power supply cords (11) from the power supplies.
All power supply and controller LEDs turn off and the blowers stop operating.
2. Remove the power supplies (2) by pressing the squeeze tabs and pulling on the power supplies until they are free of the shelf.
3. Reserve the power supplies for future use.

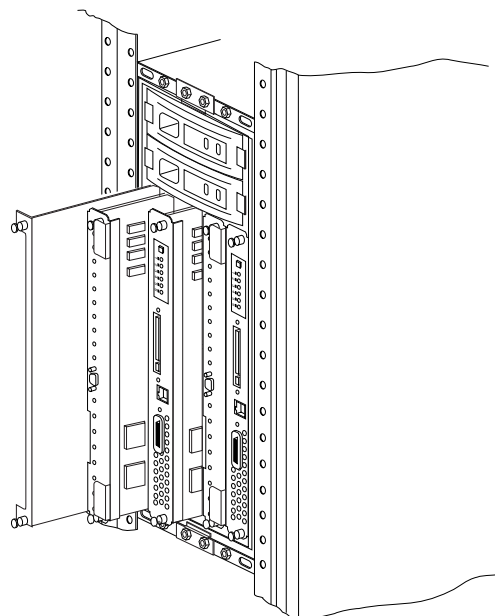
Removing a Controller Shelf

Removing the I/O Cable Panel and Cables

Refer to Figure 2-2 while completing the following procedure for removing the I/O cable panel (10) and cables. Label each cable as it is removed.

1. If ECBs are present, disconnect the ECB cables (8).
2. Disconnect the host port cable adapters (7).
3. Cut any cable ties that might interfere with the removal and replacement of the shelf.
4. Remove the I/O cable panel, as shown in Figure 2-3, by unscrewing the top and bottom screws located on the panel.

Figure 2-3 I/O Cable Panel Removal



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Removing a Controller Shelf

Note

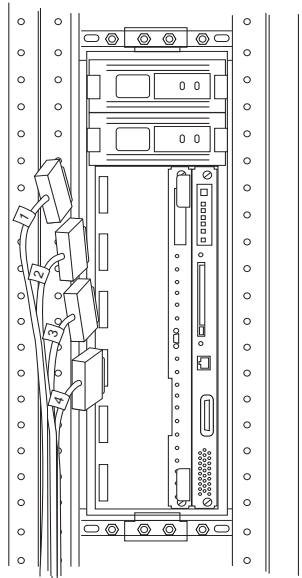
The Cache A and Controller A modules may be removed to give easier access to the I/O cables.

5. Use tape to sequentially number the cables from top to bottom, as shown in Figure 2-4.

Note

Sequential numbering is important because when the cables are reconnected on the new shelf, they are connected to the port but in reverse sequence.

Figure 2-4 I/O Cable Numbering



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6. Starting with the most accessible cable, disconnect each cable by depressing the squeeze tabs on the ends of the cables.

Removing a Controller Shelf

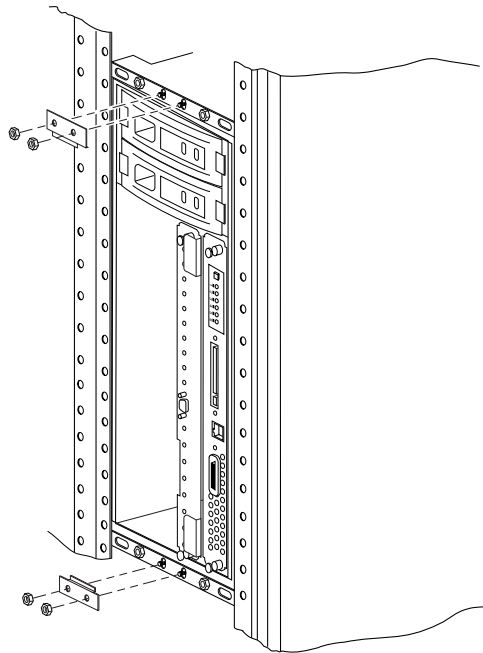
Removing the Shelf

Controller shelf components can be removed at this time to lighten the weight of the controller shelf.

Complete the following procedure to remove a vertical shelf:

1. Remove the top and bottom front shelf lock brackets as shown in Figure 2-5. These brackets might be mounted with Kep nuts or screws. Remove Kep nuts using a 5/16-inch nut driver; remove screws with a #2 Phillips screwdriver.

Figure 2-5 Removal of Front Shelf Locking Brackets



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2. Save the Kep nuts or screws for the new shelf installation.
3. Grasp the controller shelf at the top and the bottom.

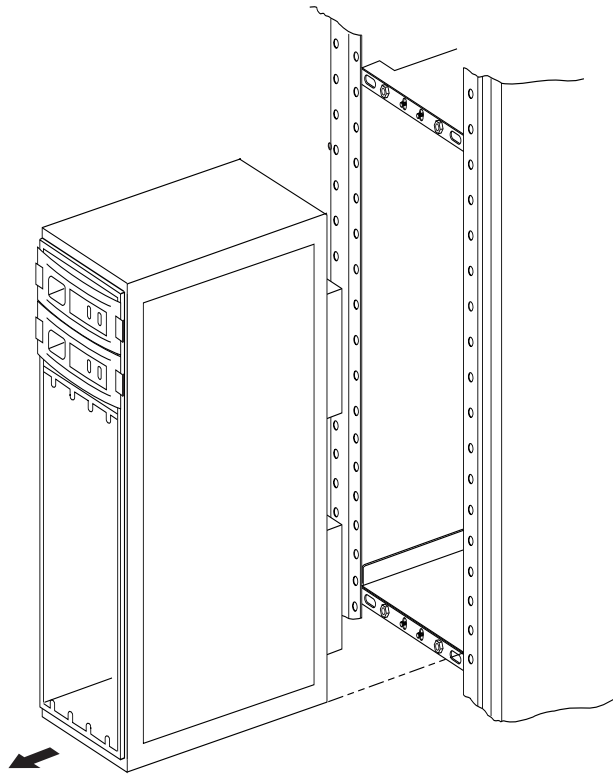
Removing a Controller Shelf

Note

Before removing the shelf, note its orientation by referencing the power supply position (top or bottom). When the new shelf is installed, it will need to be inserted with the same orientation in order for all the components to connect correctly.

4. Remove the controller shelf by gently rocking the shelf from side to side or up and down while pulling outward (see Figure 2-6).

Figure 2-6 Shelf Removal



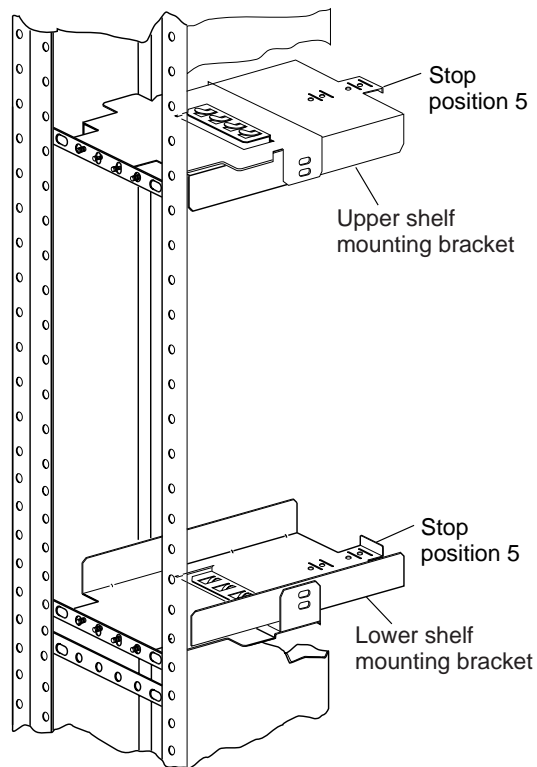
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5. Put the original controller shelf in an ESD bag.

Removing a Controller Shelf

6. For front-mounted shelves: remove the stop brackets from the upper and lower shelf mounting brackets, exposing only stop position 5 (see Figure 2-7).

Figure 2-7 Top and Bottom Front-Mounted Shelf Stop Bracket Positions

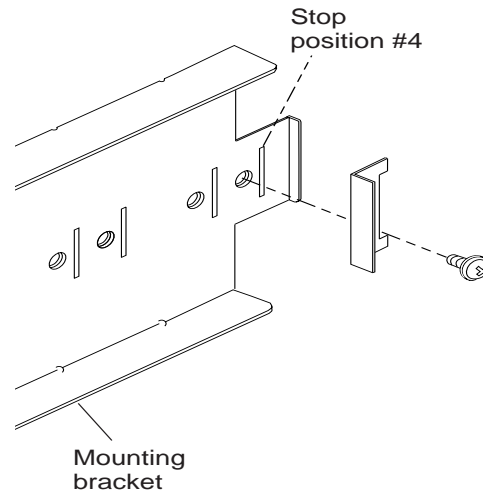


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Removing a Controller Shelf

7. For rear-mounted shelves: if necessary, install a rear stop bracket in stop position #4 as shown in Figure 2-8.

Figure 2-8 Rear-Mounted Shelf Stop Bracket Position



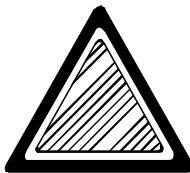
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8. You are now ready to install the new DS-BA356-MD controller shelf. Go to Chapter 3.

Installing a Replacement Shelf

Chapter 3 applies *only* if you are installing a controller shelf (DS-SWXM1-AA or DS-SWXM1-BA) as an upgrade kit. If installing as an add-on kit, go to Chapter 4.

This chapter covers the instructions for installing a DS-BA356-MD controller shelf as an upgrade kit.



Warning

Do NOT slide hands along cabinet rail edges. The rails are very sharp and might cause personal injury.

Installing a Replacement Shelf

Installing the Shelf

Complete the following procedure to install a replacement shelf:

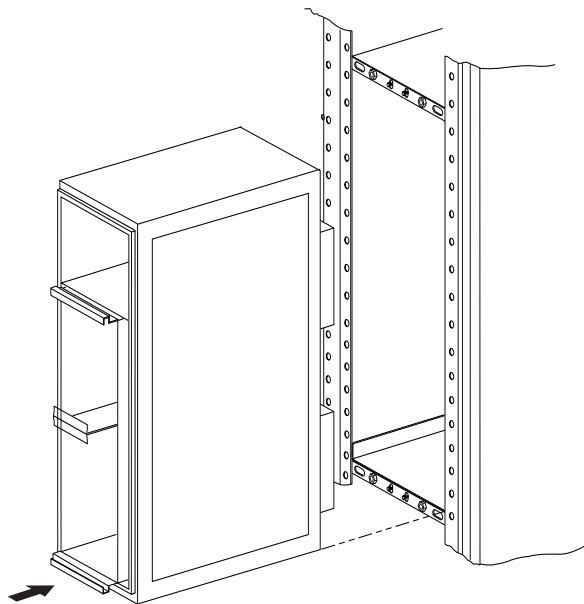
1. Ensure that the power cords and data cables are clear of the controller slot.

Note

Install the replacement shelf using the same orientation and slot as the original shelf. The location of the power supplies in the original shelf determines how the new shelf is inserted. (See Chapter 1, Figure 1-1 for typical shelf mounting orientations.)

2. Insert the shelf as shown in Figure 3-1, using a gentle rocking motion—up and down, front and back.

Figure 3-1 Inserting the Shelf in the Cabinet

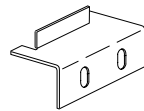


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Installing a Replacement Shelf

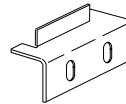
3. Ensure the shelf is firmly seated to the rear.
4. Using the shelf locking brackets provided, install them onto the shelf mounting brackets using either Kep nuts for tab-mounted brackets or screws for screw-mounted brackets. See Figure 3-2 and Figure 3-3 for shelf locking bracket examples. Figure 3-4 illustrates the installation of shelf locking brackets on a tab-mounted bracket.

Figure 3-2 Front Shelf Locking Brackets



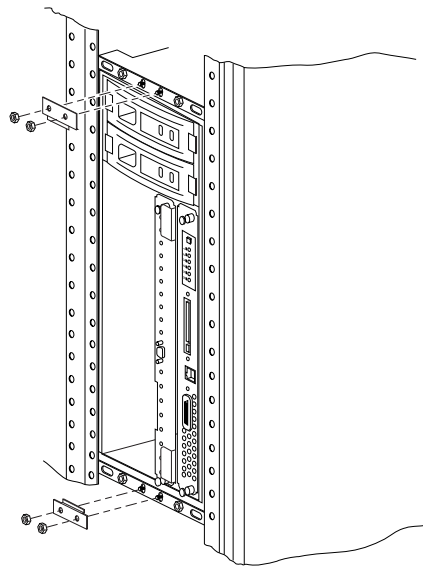
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Figure 3-3 Rear Shelf Locking Brackets



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Figure 3-4 Installing the Top and Bottom Shelf Locking Brackets



CXO6095A

Installing a Replacement Shelf

Installing the I/O Cables

Complete the following procedure to install the I/O cables:



Caution

To prevent damage to the controller or SBB, the I/O cables must be connected to SBB shelf prior to power application.

Note

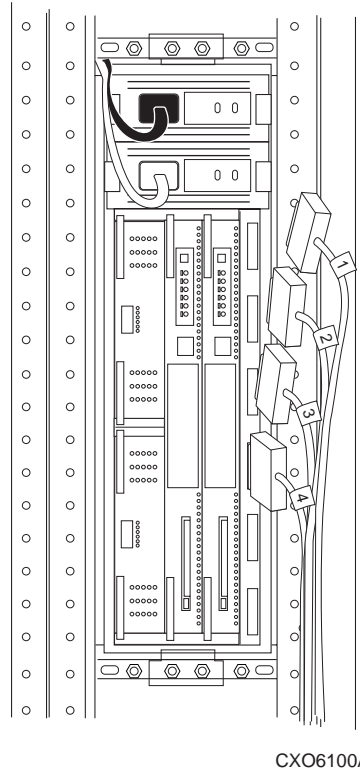
Ensure that access to the modules is not impeded in any way by the cabling.

If the one meter cable (BN21H-01) is too short for connecting the BA356 I/O module, replace it with the two meter cable provided (BN21H-02).

1. Install the numbered I/O cables on the appropriate side of the shelf, as shown in Figure 3-5. Connect them in reverse sequence, for example, beginning with #6, then #5, #4, #3, #2, and #1.

Installing a Replacement Shelf

Figure 3-5 I/O Cable Installation



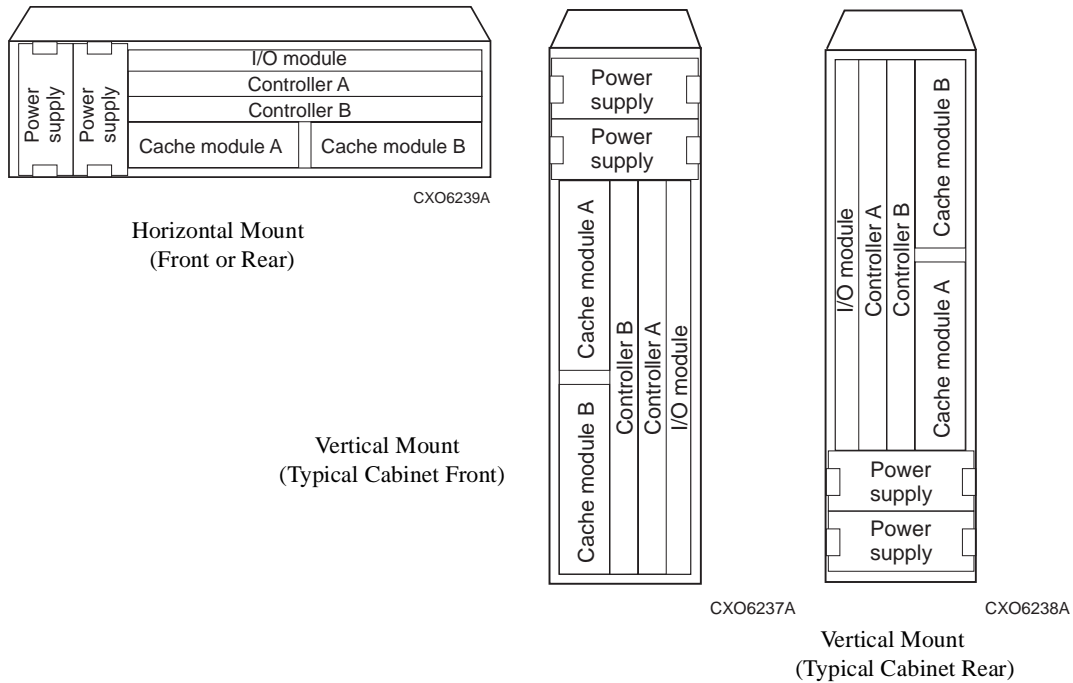
2. Ensure that the cables are firmly seated in the connectors.

Installing a Replacement Shelf

Installing the Cache and Controllers

Use the appropriate shelf mounting orientation (see Figure 3-6) and its accompanying procedure to install the cache and controllers as the following describes:

Figure 3-6 Controller Shelf Orientations



Note

It is easier to install both cache modules before installing the controllers.

If there is only one cache, install a blank panel over the Cache B slot.

If there is only one controller, install a blank panel over the Controller B slot.

Installing a Replacement Shelf

Horizontal Mount Orientation

Complete the following procedure using Figure 3-6 to install shelf components:

1. Install the cache A module in the bottom, left cache slot next to the power supplies.
2. Install cache B or blank panel to the right of cache A.
3. Install controller A in the slot immediately below the I/O module.
4. Install controller B or blank panel immediately below controller A.

Front Vertical Mount Orientation

Complete the following procedure using Figure 3-6 to install shelf components:

1. Install the cache A module in the top, left cache slot under the power supplies.
2. Install cache B or blank panel under cache A.
3. Install controller A or blank panel in the slot immediately to the left of the I/O module.
4. Install controller B or blank panel immediately to the left of controller A.

Rear Vertical Mount Orientation

Complete the following procedure using Figure 3-6 to install shelf components:

1. Install the cache A module in the bottom, right cache slot above the power supplies.
2. Install cache B or blank panel immediately above cache A.
3. Install controller A in the slot immediately to the right of the I/O module.
4. Install controller B or blank panel immediately to the right of controller A.

Installing a Replacement Shelf

Completing the Installation

Complete the following procedure to finish installing the DS–BA356–MD controller shelf upgrade kit:

1. Install and connect the ECB and cables using the *SCSI Controller Shelf Upgrade/Add-On Kits User's Guide*.
2. Install the host port cables using the appropriate array controller documentation.



Caution

Connecting the first power cord in the next step applies power to the shelf.

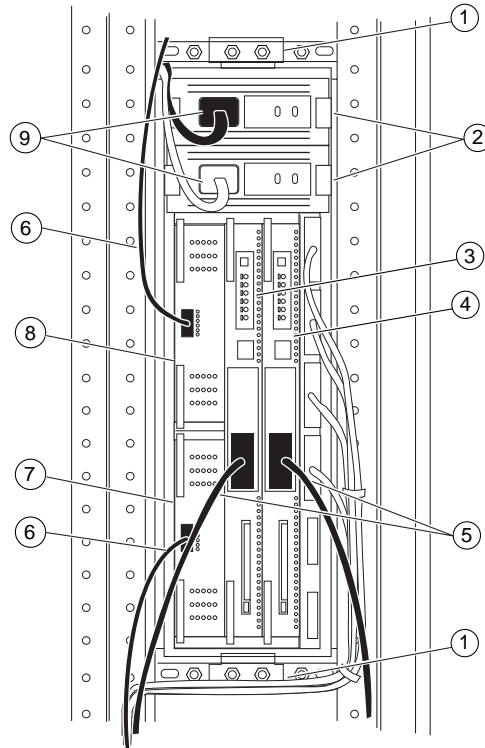
3. Connect the power supplies in both the SBB shelves and the controller shelf: the black cord to the power supply next to the locking bracket and the grey cord to the power supply next to the controller.

The green status LEDs on the power supplies turn on and the blowers start operating.

4. Dress the cables with tie wraps, ensuring that the cables do not interfere with the removal of any modules.
5. Figure 3-7 is an example of a completed DS–BA356–MD shelf configuration that includes:
 - (1) Top and bottom front shelf locking brackets
 - (2) Power supplies
 - (3) Array controller module A
 - (4) Array controller module B
 - (5) Host port adapter cables
 - (6) ECB cables
 - (7) Controller cache module A
 - (8) Controller cache module B
 - (9) Power supply cords

Installing a Replacement Shelf

Figure 3-7 Completed DS-BA356-MD Shelf Configuration



CXO6103A

6. Pack the old shelf components for disposition.
7. Setup and test the controller shelf using procedures in the appropriate array controller configuration guide.

You are finished with installing the controller shelf. Return to the *SCSI Controller Shelf Upgrade/Add-On Kits Check List* and continue.

4

Installing an Add-On Controller Shelf

Chapter 4 applies *only* if you are installing a controller shelf (DS-SWXM1-AA, DS-SWXM1-BA, or DS-BA356-MD) as an add-on kit. If installing the DS-SWXM1-AA or DS-SWXM1-BA as an upgrade kit, go to Chapter 2.

Chapter 4 covers the installation of the DS-BA356-MD controller shelf and its components as an add-on kit.

Preliminary Check List

Complete the following preliminary procedure for pertinent information regarding your installation:



Warning

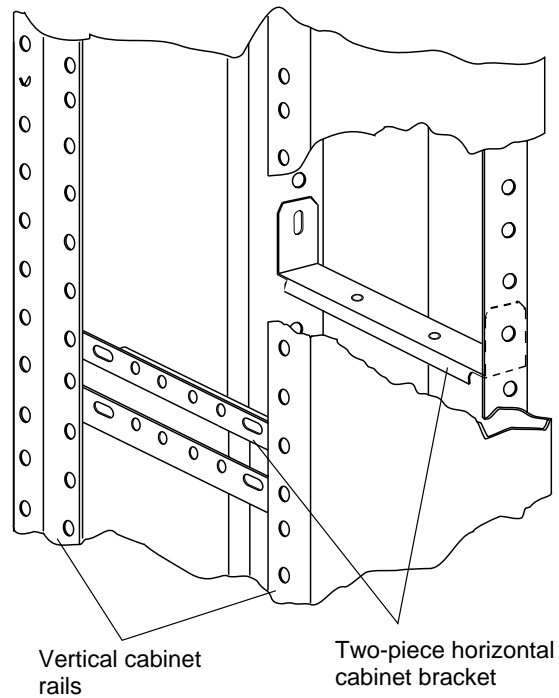
Do NOT slide hands along cabinet rail edges. The rails are very sharp and might cause personal injury.

1. Consult your DIGITAL cabinet guide for supported configurations.
2. Determine the slot in which to put the shelf.
3. For all horizontal slots, use the tab-mounted brackets located within the BA35X-RD box.

Installing an Add-On Controller Shelf

4. If the cabinet has a two-piece horizontal cabinet bracket as shown in Figure 4-1, screw-mounted brackets must be used. Go to the section in this chapter for installing screw-mounted brackets.

Figure 4-1 Two-Piece Horizontal Cabinet Bracket

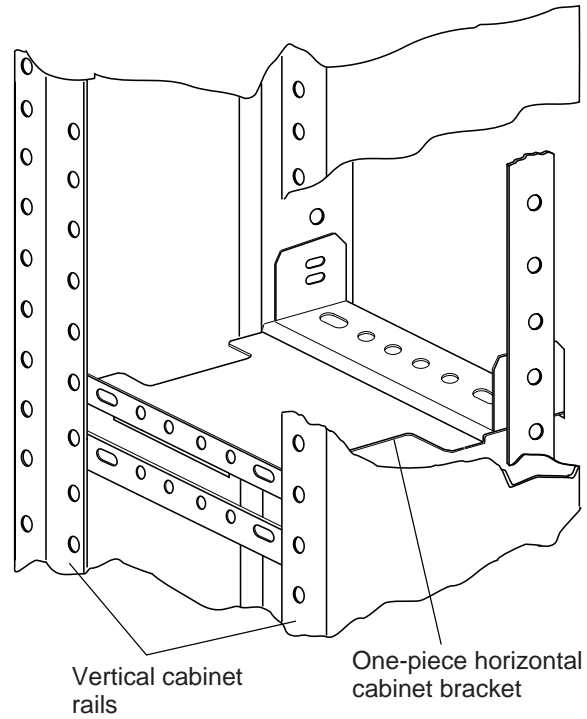


CXO4288B

Installing an Add-On Controller Shelf

5. If the cabinet has a one-piece cabinet bracket as shown in Figure 4-2, tab-mounted brackets must be used. Go to the section for installing tab-mounted brackets.

Figure 4-2 One-Piece Horizontal Cabinet Bracket



CXO4289B

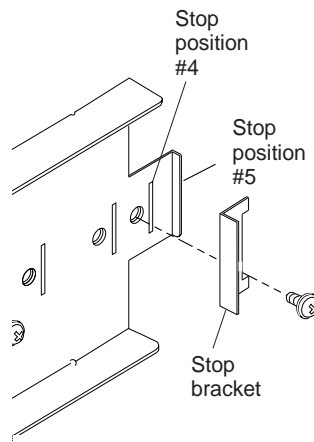
Installing an Add-On Controller Shelf

Installing a Screw-Mounted Bracket (Vertical Mount Only)

Complete the following procedure to install a vertical screw-mounted bracket:

1. Make sure the power cords and data cables are clear of the controller slot.
2. Determine the correct stop bracket position for the shelf type being installed.
 - For a front shelf installation, the stop bracket is part of the mounting bracket and uses stop position 5.
 - For a rear shelf installation, secure a stop bracket to both mounting brackets in stop position 4 with a screw (see Figure 4-3).

Figure 4-3 Stop Brackets Showing Stop Positions 4 and 5

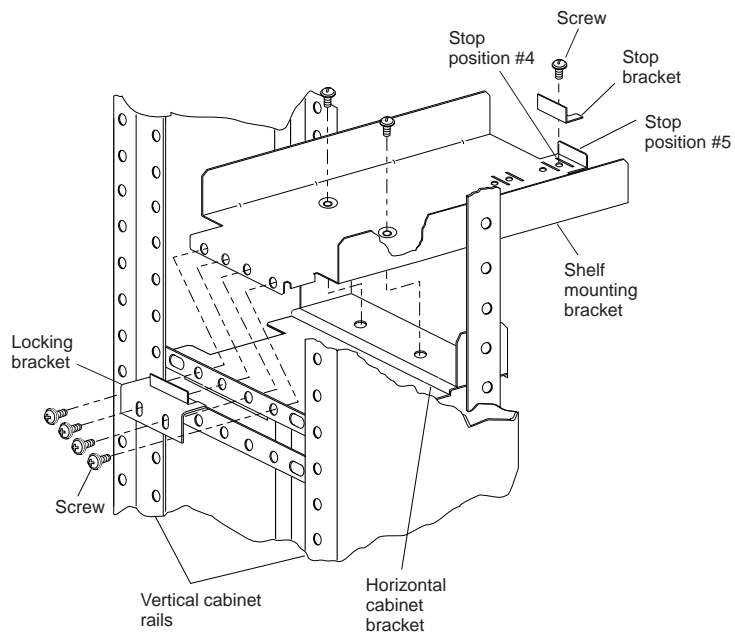


Installing an Add-On Controller Shelf

3. Install the mounting bracket:

- Position the first mounting bracket at the correct mounting holes just behind the outer flange of the horizontal cabinet rail (see Figure 4-4).

Figure 4-4 Screw-Mounted Bracket with Slot 4



CXO6248A

- Fasten the mounting bracket to the outer flange of the cabinet rail with two screws, using the left-most and right-most holes (see Figure 4-4).
 - Fasten the mounting bracket to the inner horizontal cabinet bracket with two screws.
4. Repeat steps 2 and 3 for the other mounting bracket.

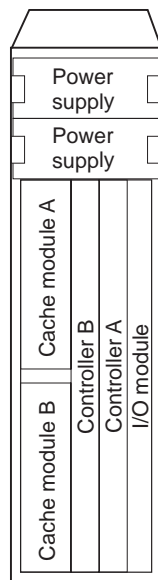
Installing an Add-On Controller Shelf

Note

Shelf orientation is determined by the shelf location (front or rear).

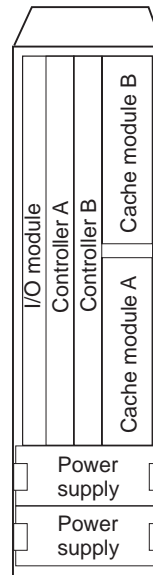
5. Orient the shelf as determined by the location of the power cords within the vertical mount slot opening as show in Figure 4-5:

Figure 4-5 Vertical Mount Orientations



CXO6237A

Vertical Mount
(Typical Cabinet front)



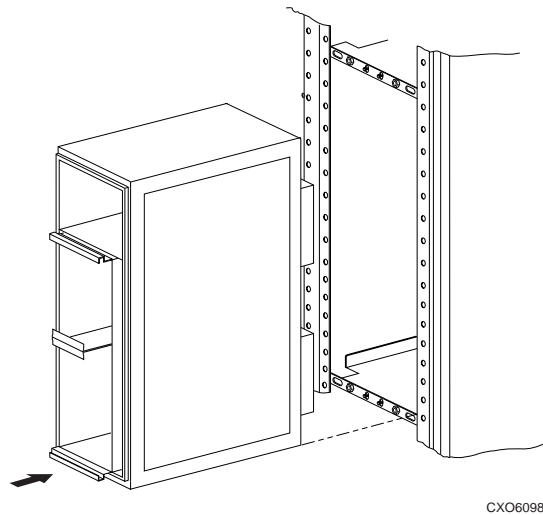
CXO6238A

Vertical Mount
(Typical Cabinet Rear)

Installing an Add-On Controller Shelf

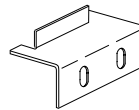
6. Gently slide the shelf into the mounting brackets as shown in Figure 4-6 and fully seat it against the stop brackets.

Figure 4-6 Inserting a Shelf into a Cabinet



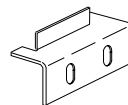
7. Based upon the shelf location (front or rear), select the two appropriate locking brackets for use:
 - For a front-mounted shelf, use locking bracket number 74-46441-02 (shown in Figure 4-7).

Figure 4-7 Front Locking Bracket



- For a rear-mounted shelf, use locking bracket number 74-46441-01 (shown in Figure 4-8).

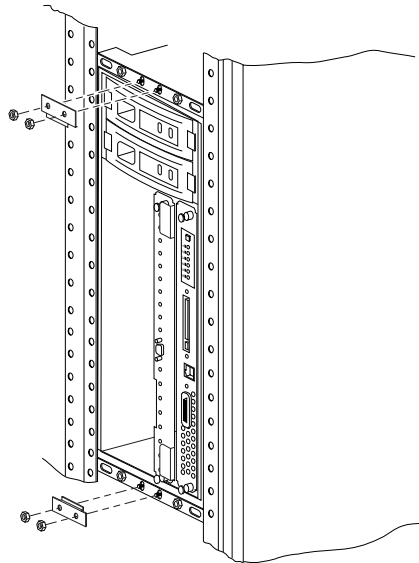
Figure 4-8 Rear Locking Bracket



Installing an Add-On Controller Shelf

8. Position the appropriate locking bracket over the middle two holes and finger tighten two screws to secure the bracket. Figure 4-9 shows Kep nuts where the screws are located on screw-mounted brackets.

Figure 4-9 Installing the Top and Bottom Shelf Locking Brackets



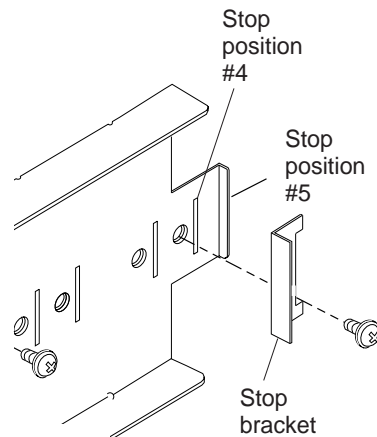
9. Firmly push the locking bracket against the shelf to seat it.
10. Tighten the two screws.
11. Repeat steps 8 through 10 for the other locking bracket.

Installing a Shelf Using Tab-Mounted Brackets

Complete the following procedure to install a shelf using tab-mounted brackets:

1. Ensure that the power cords and data cables are clear of the controller slot.
2. Determine the correct stop bracket position for the shelf type being installed.
 - For a front shelf installation, use stop position 5, which is part of the mounting bracket.
 - For a rear shelf installation, secure a stop bracket to both mounting brackets in stop position 4 with a screw as shown in Figure 4-10.

Figure 4-10 Stop Brackets Showing Stop Positions 4 and 5

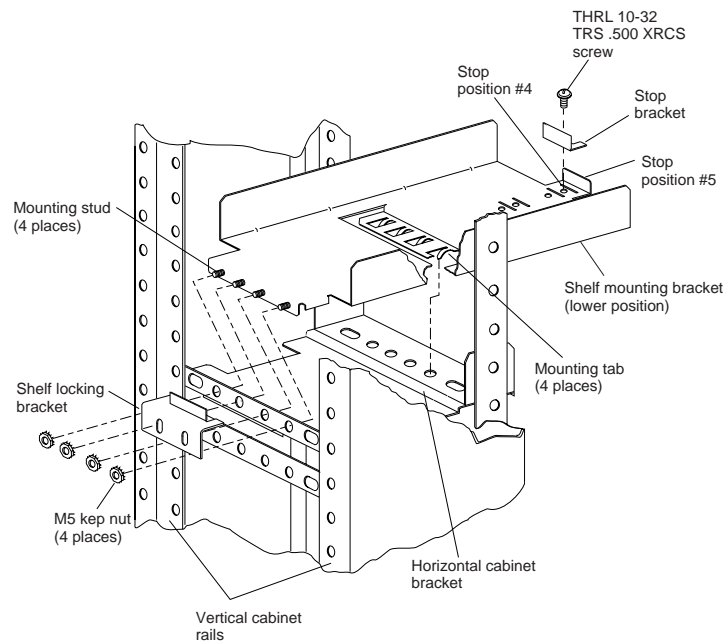


Installing an Add-On Controller Shelf

3. Install the mounting bracket:

- Position the first mounting bracket behind the outer flange and against the horizontal cabinet bracket for vertical mounting as shown in Figure 4-11 or against the vertical rail for horizontal mounting as shown in Figure 4-12.

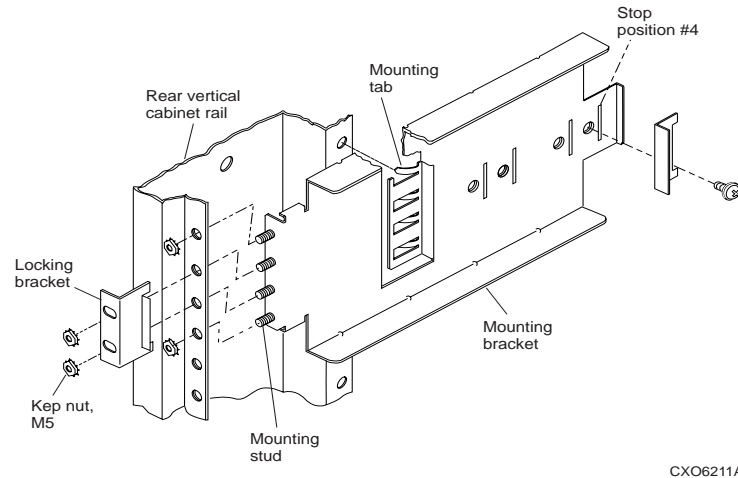
Figure 4-11 Vertical Mounting—Tab-Mounted Cabinet Bracket



CXO4075B

Installing an Add-On Controller Shelf

Figure 4-12 Horizontal Mounting—Tab-Mounted Bracket with Slot 4



- Ensure that the mounting studs align with the rail mounting holes.
 - Slide the mounting bracket forward to seat the studs and tabs, ensuring that the cables are not pinched in the process.
 - Install the Kep nuts on the outer studs and fully tighten them.
4. Repeat steps 2 and 3 for the other mounting bracket, ensuring that the second bracket aligns with the first bracket.

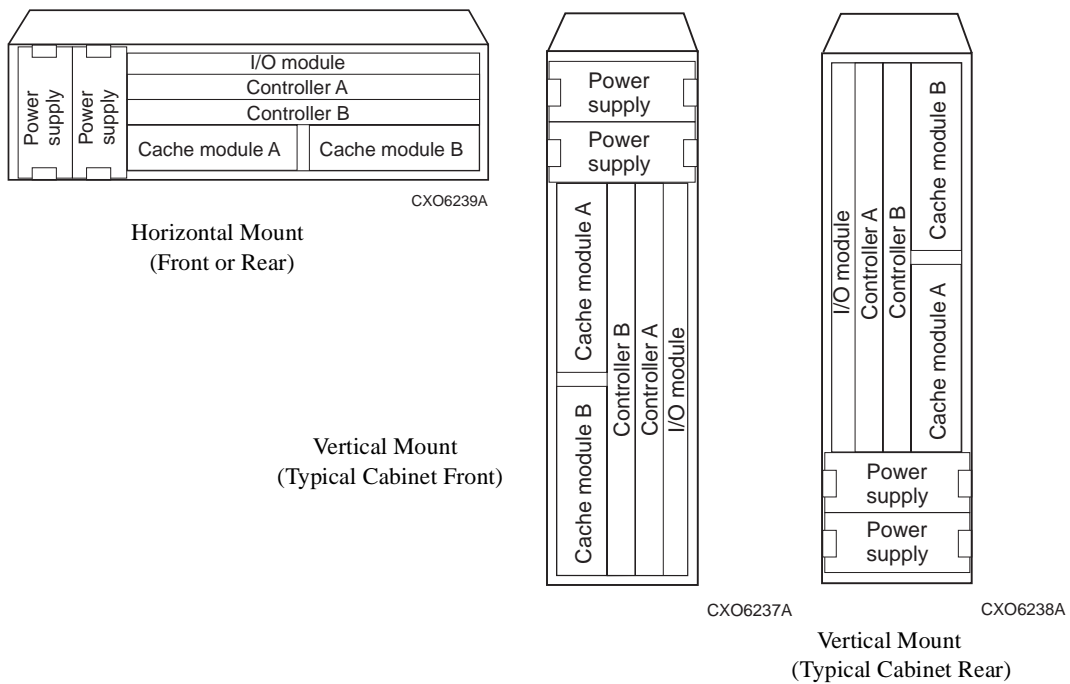
Installing an Add-On Controller Shelf

Note

Shelf orientation is determined by the shelf location (front or rear).

5. Orient the shelf as determined by the location of the power cords within the slot opening (see Figure 4-13):
 - Horizontal mount: cords are on the left, orientation is the same for front and rear.
 - Vertical mounts: if the cords are at the top, orient using typical cabinet front, or if the cords are at the bottom, orient using typical cabinet rear.

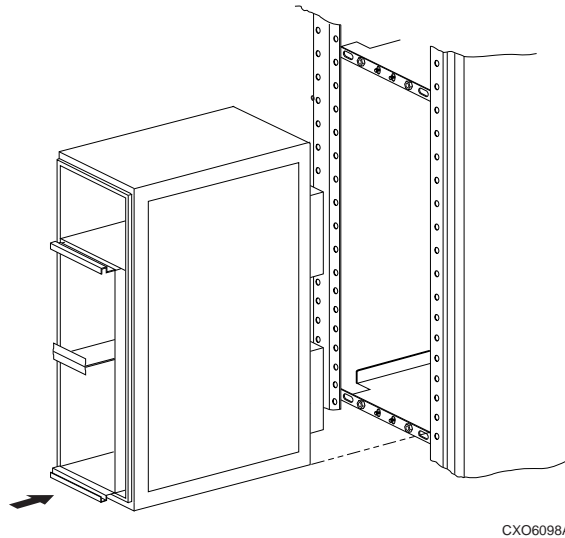
Figure 4-13 Controller Shelf Mount Orientations



Installing an Add-On Controller Shelf

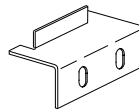
6. Gently slide the shelf into the mounting brackets as shown in Figure 4-14 and fully seat it against the stop brackets.

Figure 4-14 Inserting a Shelf into a Cabinet



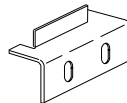
7. Based upon the shelf location (front or rear), select the two appropriate locking brackets for use:
 - For a front-mounted shelf, use locking bracket number 74-46441-02 (see Figure 4-15).

Figure 4-15 Front Locking Bracket



- For a rear-mounted shelf, use locking bracket number 74-46441-01 (see Figure 4-16).

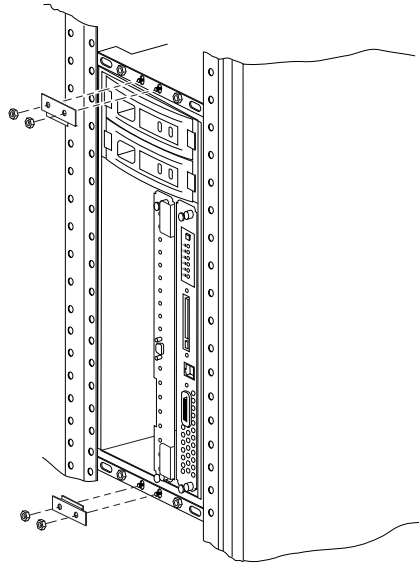
Figure 4-16 Rear Locking Bracket



Installing an Add-On Controller Shelf

8. Position the two shelf locking brackets over the two center studs on the shelf mounting brackets as shown in Figure 4-17.

Figure 4-17 Installing the Top and Bottom Shelf Locking Brackets



9. Finger-tighten two Kep nuts to secure one of the brackets.
10. Firmly push this locking bracket against the shelf to seat it.
11. Tighten the two Kep nuts for this locking bracket.
12. Repeat steps 9 through 11 for the other locking bracket.

Installing the I/O Cables

Complete the following procedure to install the I/O cables:

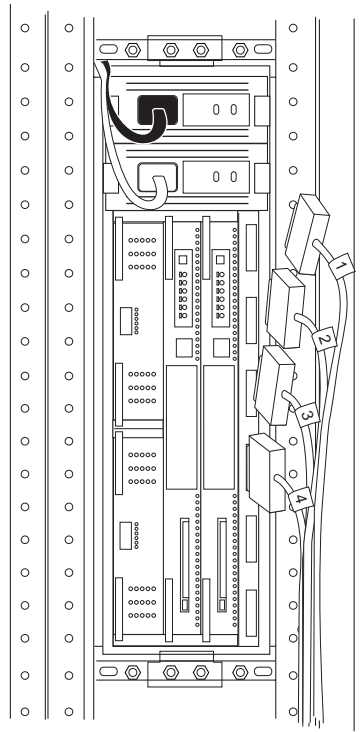


Caution

To prevent damage to the controller or to the SBBs, the I/O cables must be connected to SBB shelf prior to power application.

1. Install the I/O cables on the appropriate side of the shelf for your shelf's orientation, as illustrated in Figure 4-18.

Figure 4-18 I/O Cable Installation



CXO6100A

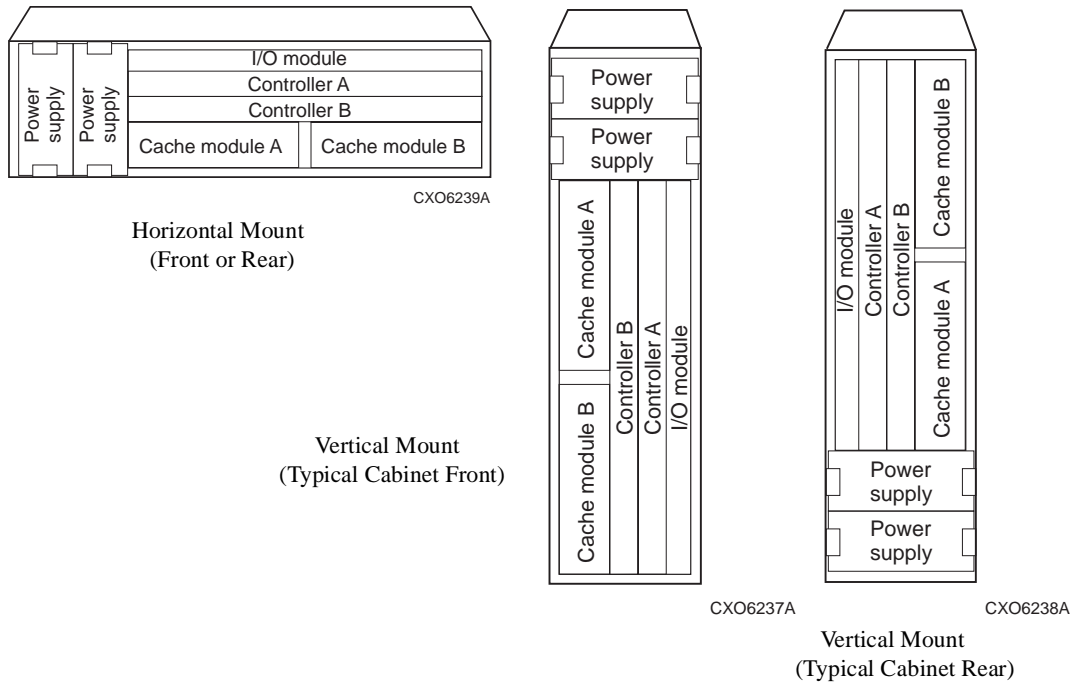
2. Ensure that the cables are firmly seated in the connectors.

Installing an Add-On Controller Shelf

Installing the Cache and Controllers

Use the appropriate shelf mounting orientation (see Figure 4-19) and its accompanying procedure to install the cache and controllers as the following describes:

Figure 4-19 Controller Shelf Orientations



Note

It is easier to install both cache modules before installing the controllers.

If there is only one cache, install a blank panel over the Cache B slot.

If there is only one controller, install a blank panel over the Controller B slot.

Installing an Add-On Controller Shelf

Horizontal Mount Orientation

Complete the following procedure using Figure 4-19 to install shelf components:

1. Install the cache A module in the bottom, left cache slot next to the power supplies.
2. Install cache B or blank panel to the right of cache A.
3. Install controller A in the slot immediately below the I/O module.
4. Install controller B or blank panel immediately below controller A.

Front Vertical Mount Orientation

Complete the following procedure using Figure 4-19 to install shelf components:

1. Install the cache A module in the top, left cache slot under the power supplies.
2. Install cache B or blank panel under cache A.
3. Install controller A in the slot immediately to the left of the I/O module.
4. Install controller B or blank panel immediately to the left of controller A.

Rear Vertical Mount Orientation

Complete the following procedure using Figure 4-19 to install shelf components:

1. Install the cache A module in the bottom, right cache slot above the power supplies.
2. Install cache B or blank panel immediately above cache A.
3. Install controller A in the slot immediately to the right of the I/O module.
4. Install controller B or blank panel immediately to the right of controller A.

Installing an Add-On Controller Shelf

Completing the Installation

Complete the following procedure to finish installing the DS–BA356–MD controller shelf add-on kit:

1. Install and connect the ECB and cables using the *SCSI Controller Shelf Upgrade/Add-On Kits User's Guide*.
2. Install the host port cables using the appropriate array controller documentation.



Caution

Connecting the first power cord in the next step applies power to the shelf.

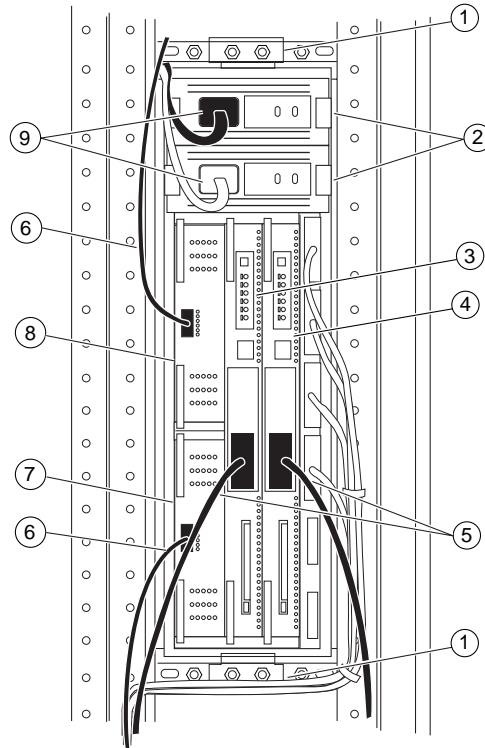
3. Connect the power supplies in both the SBB shelves and the controller shelf: the black cord to the power supply next to the locking bracket and the grey cord to the power supply next to the controller.

The green status LEDs on the power supplies turn on and the blowers start operating.

4. Dress the cables with tie wraps, ensuring that the cables do not interfere with the removal of any modules.
5. Figure 4-20 is an example of a completed DS–BA356–MD shelf configuration that includes:
 - (1) Top and bottom front shelf locking brackets
 - (2) Power supplies
 - (3) Array controller module A
 - (4) Array controller module B
 - (5) Host port adapter cables
 - (6) ECB cables
 - (7) Controller cache module A
 - (8) Controller cache module B
 - (9) Power supply cords

Installing an Add-On Controller Shelf

Figure 4-20 Completed DS-BA356-MD Shelf Configuration



CXO6103A

6. Pack the old shelf components for disposition.
7. Setup and test the controller shelf using procedures in the appropriate array controller configuration guide.

You are finished with installing the controller shelf.

