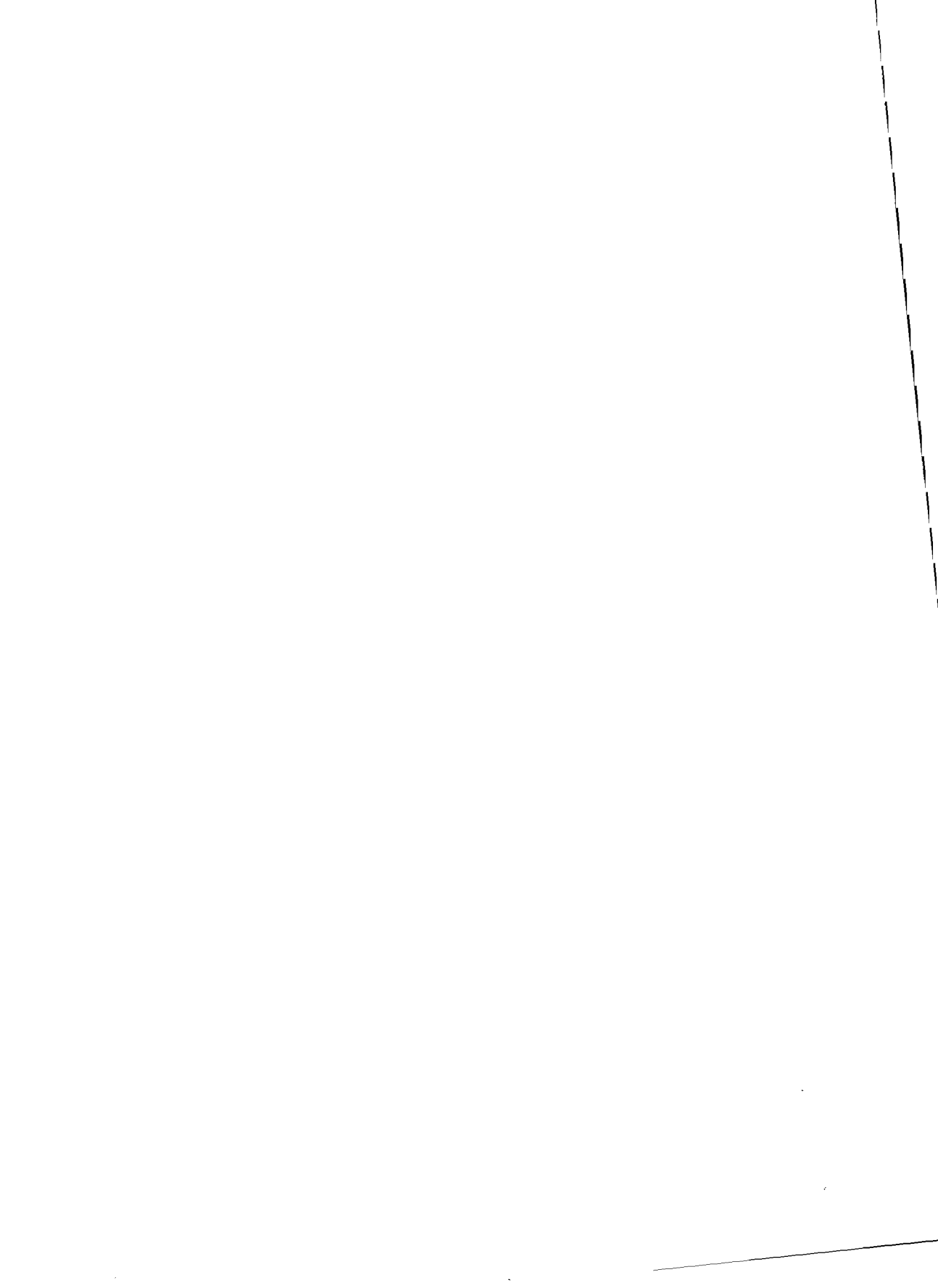


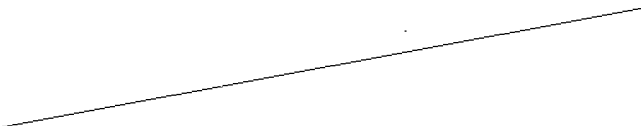
Exemplar
S-Class and
X-Class Servers

Barracuda 9 Installation and Service Guide

First Edition



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United States of America



Barracuda 9

Installation and Service Guide

Exemplar S-Class and X-Class Servers

A4716-90008

First Edition

January 1997

Hewlett-Packard Company
Convex Division
Richardson, Texas
United States of America

Barracuda 9 Installation and Service Guide Exemplar S-Class and X-Class Servers

A4716-90008

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Printed in the United States of America

Revision Information for Barracuda 9 Installation and Service Guide

Edition	Document No.	Description
First	A4716-90008	Initial release January 1997.



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Preface

Purpose and audience

The *Barracuda 9 Installation and Service Guide: Exemplar S-Class and X-Class Servers* provides technical information on the Seagate 9 Gb Barracuda Disk drive and related equipment. This guide describes how to:

- Install the Barracuda 9 disk drive
- Integrate the Barracuda 9 disk drive into the SPP-UX operating system

This document is intended for

- Hewlett-Packard customers
- Hewlett-Packard Customer Engineers
- Hewlett-Packard TAC
- Hewlett-Packard I/O development

Notational conventions

This section discusses notational conventions used in this book.

Bold monospace

In command examples, text shown in **bold monospace** identifies user input that must be typed exactly as shown.

Monospace

In paragraph text, `monospace` identifies command names, system calls, and data structures and types.

In command examples, `monospace` identifies command output, including error messages.

In command syntax diagrams, text shown in `monospace` must be typed exactly as shown.

Italic

In paragraph text, *italic* identifies new and important terms and titles of documents.

In command syntax diagrams, *italic* identifies variables that must be supplied by the user.

**Notes and
Cautions**

This document presents notes and cautions in the following formats.

Note

A Note highlights supplemental information.

Caution

A Caution highlights information necessary to avoid damage to the system.

Associated documents

For more information you can order these books from Hewlett Packard:

- *SPP-UX System Administration Guide: Exemplar S-Class Servers* (B5655-90002). This book introduces users to the SPP-UX operating system.
- *Exemplar Programming Guide: S-Class and X-Class Servers* (B5600-90001). This book is the standard reference for the SPP-UX operating system.
- *Exemplar Diagnostics Guide: S-Class and X-Class Servers* (A4716-90002). This book is the diagnostics manual for the Hewlett-Packard Exemplar S-Class and X-Class Servers.

Ordering documents

To order additional copies of this document or other documents listed in "Associated Documents", send requests to:

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Convex Division
Customer Service
P.O. Box 833851
Richardson TX 75083-3851 USA

Please include the document number (xxxxx-9xxxx number) or the exact title of the document.

Technical assistance

If you have questions that are not answered in this book, contact the Hewlett-Packard Convex Technical Assistance Center (TAC) at the following locations:

Within the continental U.S., call 1 (800) 952-0379.

From Canada, call 1 (800) 345-2384.

All other locations, contact your local Hewlett-Packard office.

You can also use the `contact` utility, if you would like to report any problems you may have with Barracuda 9 or its associated documentation.

FCC notice

This equipment generates, uses, and can radiate radio frequency energy. Equipment not installed and used in strict accordance with the instruction manual may cause interference to radio communications.

This equipment has been tested and found to comply with limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when equipment is operated in a commercial environment.

Operating this equipment in a residential area will likely cause interference. In this case, the interference must be corrected at the operator's expense.

Do not connect external equipment to the utility outlets in the Exemplar S-Class and X-Class Servers. Unauthorized connection voids all agencies' emissions certification.

Electrostatic discharge protection

The Barracuda 9 and related assemblies are sensitive to static electricity. All semiconductors, as well as some resistors and capacitors, may be damaged or degraded by exposure to static electricity. Also, some devices, such as metal-oxide semiconductors, are extremely sensitive.

Electrostatic damage to electronic devices can be caused by the direct discharge of a charged conductor or by exposure to the static fields surrounding charged objects.

Caution

Do not service the equipment before observing the following precautions:

- Ground yourself to the peripheral node or a grounded service area.

Whenever working on the Barracuda 9 or related assemblies, or whenever electronics are exposed connect yourself to ground with a wrist strap. Make the connection to any grounded metal assembly in the peripheral cabinet.

Remember that you and the electronic devices must both be grounded to avoid potentially damaging static discharges.

- Set up a grounded work area.
- Turn off power before removing or installing power cords.
- Do not remove any circuit boards from the drive.
- Never use an ohmmeter on any Barracuda 9 circuit board.

Grounded work area

Set up a grounded work area by using a static dissipating mat grounded to the chassis. Use a wrist strap connected to the mat when servicing peripherals that have been removed from the chassis.

Antistatic packaging

Hewlett Packard equipment arrives enclosed in a specially designed bag that dissipates static electricity and serves as a shield against electrostatic fields while in transit.

The bag is not designed for use as a static dissipating mat. Do not use the antistatic bag for any purpose other than to enclose the assembly.

Holes in the bag render it useless as an antistatic measure. Therefore, it should always be completely closed and sealed when in use.

Any bag that shows damage or wear should immediately be discarded and replaced.

This chapter discusses the features, electromechanical specifications, and physical specifications of the Hewlett-Packard Exemplar S-Class and X-Class Server Barracuda 9 disk drive.

Disk description

The Barracuda 9 disk drive (HP/CXD P/N 204-000047-200) is used as a disk in the Disk Chassis in the Hewlett-Packard Exemplar S-Class and X-Class Server Family. It is a 3.5 ultra wide SCSI differential Barracuda 9 disk drive with an integrated SCSI controller. This drive is capable of 10 Mbytes/sec data transfer rate. Multiple disks on a single SCSI bus can achieve up to 40 Mbytes/sec.

Table 1 lists product information necessary to refer to when ordering or replacing this drive.

Table 1 Product information

Product type	Barracuda 9 disk
Hewlett-Packard model number	ST19171WD
Hewlett-Packard marketing number	DKD-2900
Hewlett-Packard part number	204-000047-200

Drive specifications

Table 2 contains the basic specifications for the Barracuda 9 disk drive.

Table 2 Drive specifications

Characteristics	Conditions	Specifications
Size of Barracuda 9 disk drive (HP/CXD P/N 204-000047-200)	Width	4.0 in. (101.6 mm)
	Height	1.62 in. (41.1 mm)
	Depth	5.75 in. (146.05 mm)
	Weight	2.3 lb (1.04 kg)
Interface	NA	SCSI-3 Fast-20 (Ultra-SCSI)
Capacity(Mbytes)	Unformatted	11,700 Mbytes
Physical	Number of data heads	20
	Disk diameter	3.7 in. (95 mm)
Transfer rate	Disk speed at 7200 RPM	0.5 - 40.0 Mbytes(burst)
Seek time (time required to move heads to a different track address)	Average	8.0 ms (read), 9.5 ms (write)
	Full Stroke	19 ms (read), 20 ms (write)
	Single track	0.6 ms (read), 1.1 ms (write)
Latency (time required to reach a particular track address after head positioning is complete)	Average	4.17 ms
Start time (following power sequence delay, dc is applied and start conditions are present)	Maximum	30 s
Stop time	Maximum	30 s
Environmental requirements	Operating temperature	41° F to 122° F (5° C to 50° C) with a maximum change of 36° F (20° C) per hour
	Operating humidity	5% to 95% relative Maximum wet bulb of 82° F (28° C)

dc power requirements

The Barracuda 9 disk drive uses +5 Vdc and 12+ Vdc as shown in Table 3 below.

Table 3 Barracuda 9 disk drive dc power requirements

Power requirements	Supply voltage	
	+5 V	+12 V
Voltage	+5 V	+12 V
Regulation	± 5%	± 5%
Current		
Maximum operating current	1.17 A	0.89 A
Average Idle current	0.96 A	0.73 A
Maximum starting current	1.04 A	2.18 A
Maximum seek current	1.77 A	1.8 A

Drive jumpers

Figure 1 illustrates the Barracuda 9 drive option select jumper connectors located on the rear of the disk drive. Jumper J2 configures parity checking, enable, and delay motor start, as well as the write protect function. Jumper J1-A selects the SCSI ID. See Figure 1 and Figure 2.

Figure 1 Rear view of Barracuda 9 disk drive

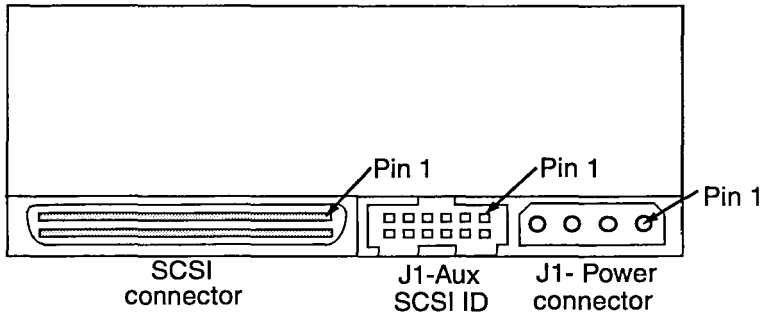
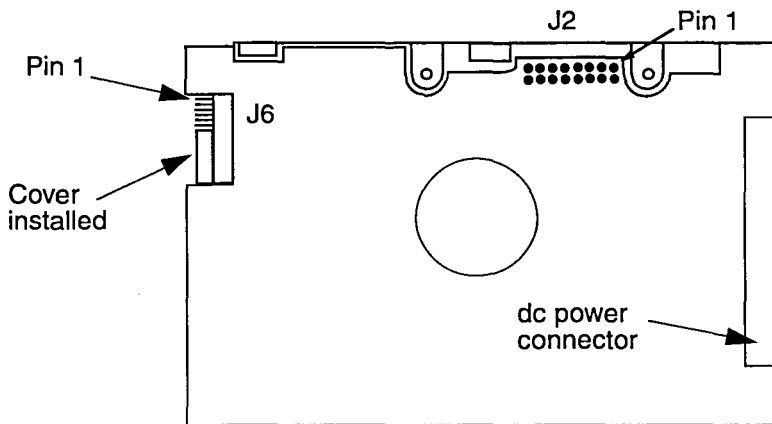


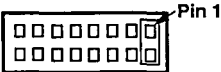
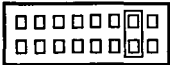
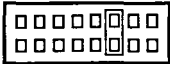

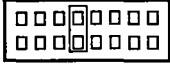

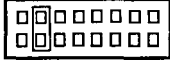
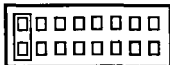
Figure 2 Top view of Barracuda 9 disk drive



Jumper block J2

Jumper block J2 is a 16-pin configuration select header. Pins 1 and 2 of jumper block J2 make up the only jumper position that is installed. Table 3 describes the jumper block J2 pin assignments. See Figure 2 for the location of jumper block J2.

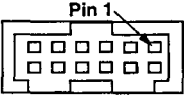
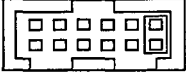
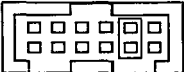
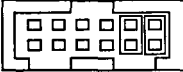
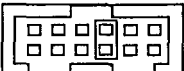
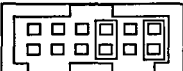
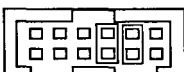
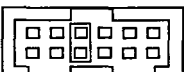
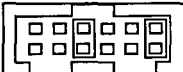
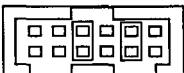
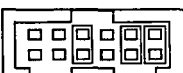
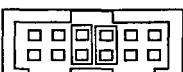
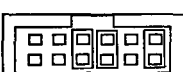
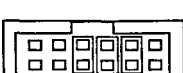
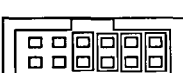
Table 4 Jumper block J2 option descriptions

Pins	Jumper Function	Default configuration	Location
1 & 2	Terminator power supplied to SCSI bus. Jumper installed causes drive to supply terminator power to the SCSI bus.	Installed	
3 & 4	Terminator power supplied from the SCSI bus. Jumper installed causes SCSI bus to provide terminator power to the internal terminators. For only single-ended drives.	Not installed	
5 & 6	Reserved	Not installed	
7 & 8	SCSI Parity Disable. Jumper out causes drive to check for parity.	Not installed	
9 & 10	Write Protect. Jumper installed protects drive.	Not installed	
11 & 12	Enable Motor Start. Jumper out causes spindle to start according to the motor start delay option jumper. Jumper installed causes the spindle to start spinning only when a Start Unit command is received	Not installed	
13 & 14	Delay Motor Start. Jumper used only if the Start Command option jumper is not installed. Jumper not installed causes the spindle to turn as soon as power is applied to the drive.	Not installed	
15 & 16	SCSI Terminator Enable. Jumper installed connects the terminal termination to the I/O lines. Valid for single-ended drives only.	Not installed	

Jumper block J1-A SCSI Target IDs

Jumper block J1-A is used for setting the SCSI address ID of the drive. Table 5 contains the basic SCSI assignments and Figure 3 and Figure 4 on page 7 show the layout of the disks and SCSI address setting in effect when the Barracuda 9 is used in the Disk Tray configuration.

Table 5 Jumper block J5 SCSI ID assignments

SCSI ID	Jumper Setting	SCSI ID	Jumper Setting
SCSI ID = 0		SCSI ID = 1	
SCSI ID = 2		SCSI ID = 3	
SCSI ID = 4		SCSI ID = 5	
SCSI ID = 6		SCSI ID = 7	RESERVED
SCSI ID = 8		SCSI ID = 9	
SCSI ID = A		SCSI ID = B	
SCSI ID = C		SCSI ID = D	
SCSI ID = E		SCSI ID = F	

Disk Tray layout with SCSI IDs

Figure 3 and Figure 4 show the layout of the disks and SCSI address settings for the Barracuda 9 used in the Disk Tray in either the Disk Tray left configuration or Disk Tray right configuration.

Figure 3 Disk Tray left configuration of SCSI IDs

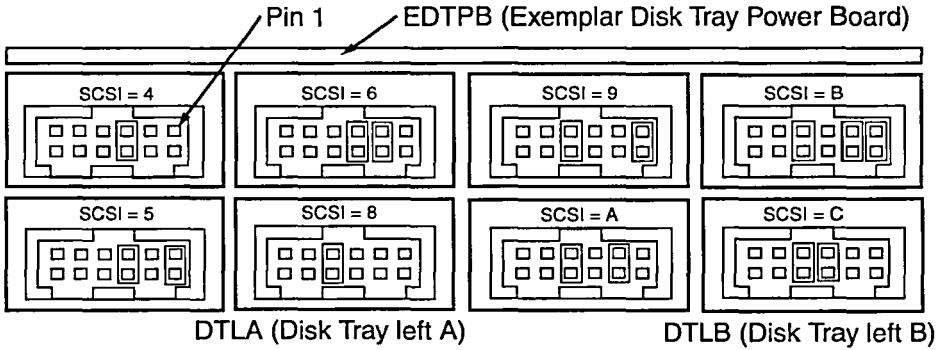
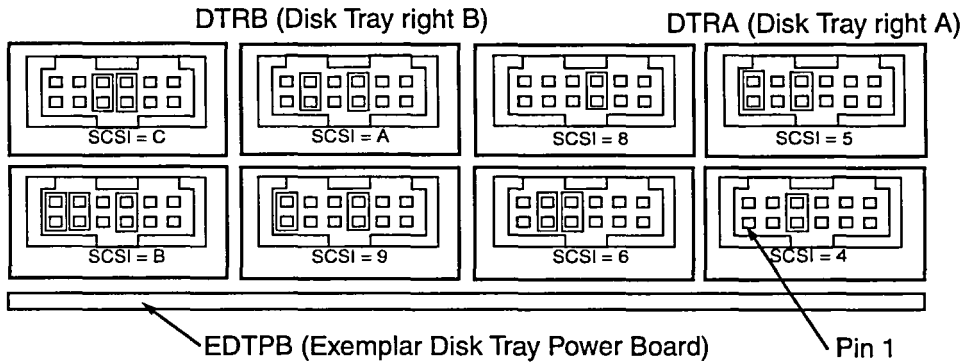


Figure 4 Disk Tray right configuration of SCSI IDs



In Figure 4 the view is an upside-down view of the Disk Tray installed in the Disk Tray right configuration in the server.

Power supply specifications

The dc power module is a business-card-size power supply. It is a surface-mount power supply used with the Barracuda 9 disk drive in Exemplar S-Class and X-Class Servers. This module mounts to the Exemplar Disk Tray Power Board (EDTPB), when used in conjunction with the Disk Tray.

Table 6 and 7 show the power module specifications.

Table 6 Power supply characteristics

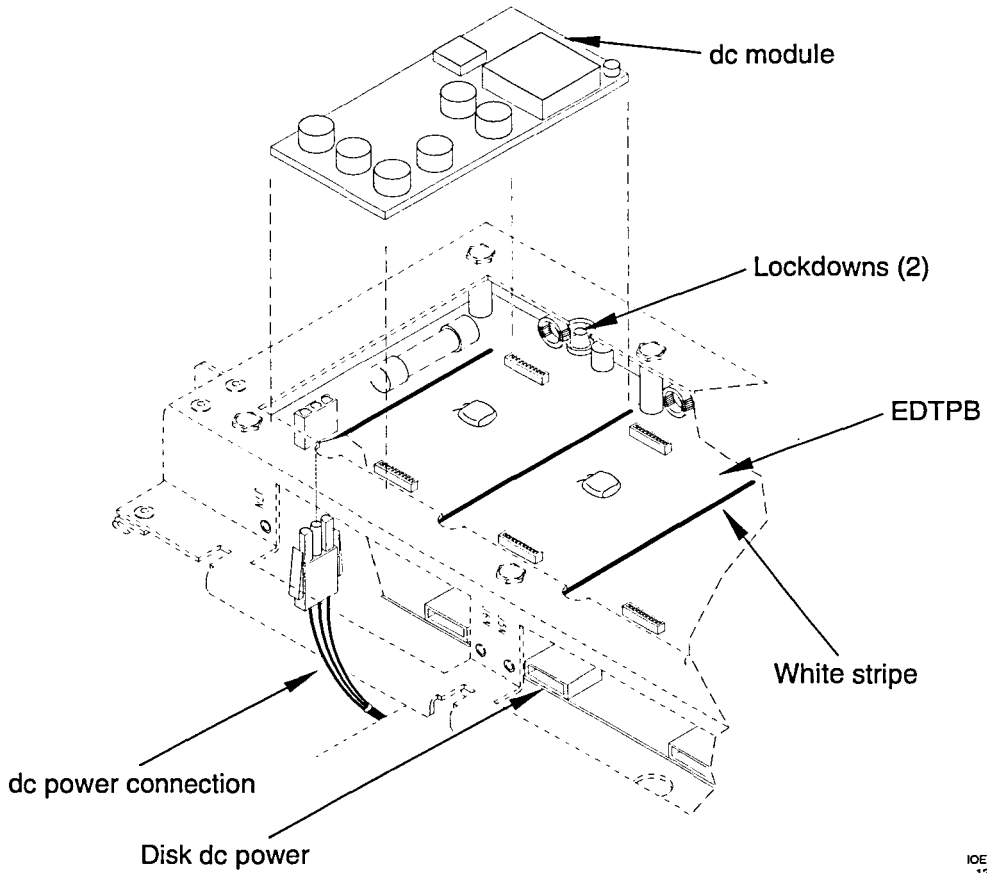
Parameter	Condition	Limits
Operating input voltage	NA	36 Vdc to 72 Vdc
Maximum input current	Steady state	1.5 A maximum
	During spin-up surge	2.6 A maximum
	Start-up current	2.2 A maximum
Output voltage regulation	NA	± 0.3% typical
Output overvoltage shutdown	NA	5.40 V to 6.00 V maximum
	NA	12.75 V to 14.0 V maximum
Operational environment	Operational altitude	- 200 ft. (- 60m) to 8000 ft. (2500m)
	Operational temperature	41°F to 122°F (5° C to 50° C)
	Storage temperature	- 40°F to 185°F (- 40° C to 85° C)
	Relative humidity	5 to 95 %
Weight	NA	2.5 oz. (71g)

Table 7 Power supply voltage specifications

Output voltage	+5 Vdc	+12 Vdc
Minimum output voltage	4.85 Vdc	11.64 Vdc
Maximum output voltage	5.25 Vdc	12.60 Vdc
Output current - maximum	2.2 A	2.5 A
Output ripple and noise pk-pk (5 Hz to 20 Hz)	50 mV	60 mV
Output voltage regulation	0.3 %	0.3 %

Figure 5 shows a dc module in the Exemplar Disk Tray Power Board (EDTPB) configuration.

Figure 5 Detail of EDTPB with a dc module



IOEXS030
12/18/06

This chapter describes unpacking and inspection of the Barracuda 9 disk drive prior to installation, as well as instructions how to fill out damage claims.

Unpacking

All shipping containers are designed to protect their components under normal shipping conditions. Carefully inspect each carton for signs of shipping damage before it is unpacked. If visual inspection reveals damage, document the damage with photographs, and contact the transport carrier immediately.

Bill of materials check

The customer's bill of materials lists all equipment shipped from Hewlett-Packard. Use it as a checklist to ensure that all equipment has arrived. Use the following procedure to unpack the shipping container:

- Step 1** Remove each item from its shipping container.
- Step 2** Inspect each item as it is unpacked for any signs of shipping damage.
- Step 3** If equipment damage is found, document the damage with photographs and proceed to the next section.

Save all packing material until after operational checkout of the equipment. This enables equipment to be returned safely to Hewlett-Packard if required.

Damage claims

If the equipment is damaged, users must complete a damage claim and give it to the shipping representative. Claim forms are normally obtained from the shipping representative

This section contains the installation of the Barracuda 9 when used in the Disk Tray configuration of the Exemplar S-Class and X-Class Servers.

Overview of installation

Installation steps required to install a disk into the Disk Tray involve removal of side skins, EMI panels, and Disk Tray from the Exemplar chassis. The following list provides a summary of the steps involved in the installation process.

Note

This list is intended for summary purposes only; detailed installation instructions are presented in the sections that follow.

- Step 1** Shut down the system.
- Step 2** Locate the Disk Tray at the top for the right side of the chassis or bottom for the left side of the chassis.
- Step 3** Remove the left or right cabinet side skin of the chassis.
- Step 4** Remove the Electromagnetic Interface (EMI) panels.
- Step 5** Unplug the Exemplar Disk Tray Power Board (EDTPB) dc power cable.
- Step 6** Loosen the capture screws holding the Disk Tray.
- Step 7** Lift and slide out the Disk Tray enough to disconnect the PCI SCSI cables from the Disk Tray.
- Step 8** Remove the Disk Tray from the system to an ESD safe work surface.
- Step 9** Unplug the disk dc power cable(s) between the EDTPB and the disk pair assembly.
- Step 10** Disconnect the Disk Tray A (DTRA) or (DTLA) and B (DTRB) or (DTLB) SCSI cables.

- Step 11** Remove the disk pair assembly to add a disk or install a new disk pair assembly in the Disk Tray.
- Step 12** Install the disk in the disk pair assembly bracket.
- Step 13** Set the added disk SCSI ID.
- Step 14** Remove the power supply protection strip.
- Step 15** Install the dc module for the new disk in the EDTPB.
- Step 16** Reinstall the power supply protection strip.
- Step 17** Plug in the disk dc power cable from the drive to the EDTPB.
- Step 18** Reinstall the Disk Tray A and B SCSI cables.
- Step 19** Reinstall the Disk Tray in the chassis to enable reinstallation of the PCI SCSI cables to the Disk Tray.
- Step 20** Slide the Disk Tray in and tighten the capture screws.
- Step 21** Reinstall the EDTPB dc power cable to the EDTPB.
- Step 22** Reboot system and check the disk is operational, by checking the dc module LEDs on the EDTPB for the drive.
- Step 23** Reinstall the EMI panels and side skins.
- Step 24** Integrate the drive into the server by checking mapping and using `diskutil`.

Preparation

Follow the procedure below to prepare to remove the Disk Tray from either the Disk Tray left location or Disk Tray right location:

Observe the electrostatic discharge procedures described in the "Grounded work area" section on page xv to prevent damage to the drives and Disk Tray during installation.

Caution

Do not disconnect any SCSI cables from the Disk Tray without first using the `/etc/shutdown -h <time>` command to halt the SPP-UX. Failure to do so may cause a node crash.

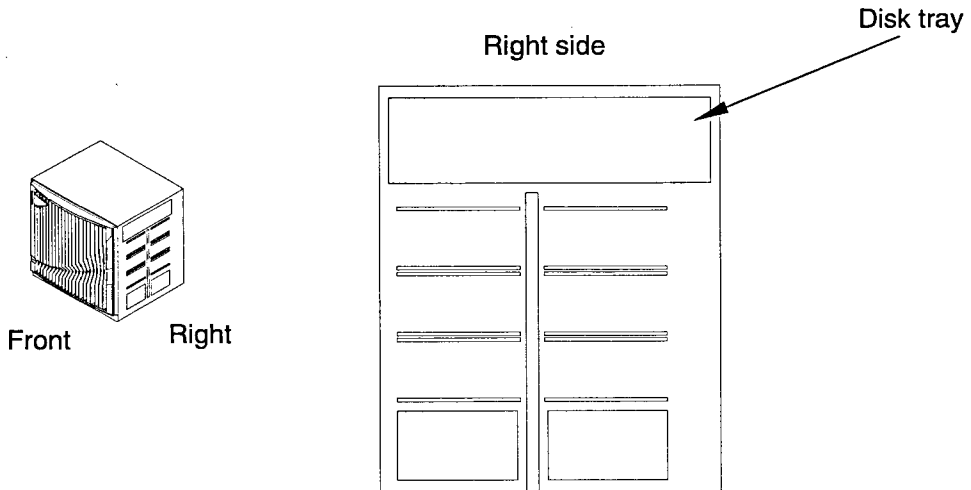
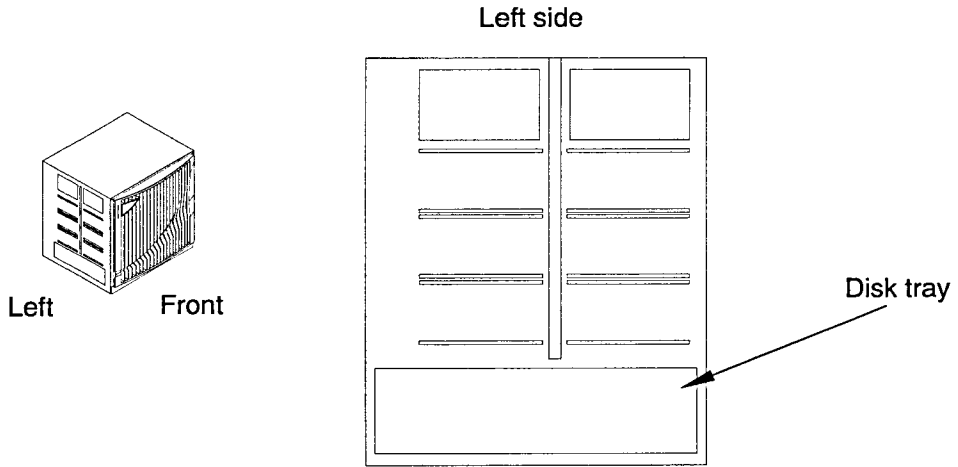
Step 1 Shut down the system with the `etc/shutdown` command.
`/etc/shutdown -h <time>`

The `time` argument can be used to schedule a timed shutdown or the keyword "now" can be used to shut down the system immediately. Refer to the *SPP-UX System Administration Guide* or the `shutdown(8)` man page for more information on `/etc/shutdown`.

Step 2 Power down the Exemplar chassis by turning the key switch located on the left panel near the DAT drive to the OFF position.

Step 3 Check the configuration diagram below and locate the Disk Tray.

Figure 6 Location of Disk Tray left and right



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Disk Tray removal

To install disks remove the Disk Tray. Depending on the location of the disk to be installed follow the procedures below.

Notes

Disk Tray left drive configurations from the left bottom section of the chassis are covered in the "Disk Tray left removal" section on page 18.

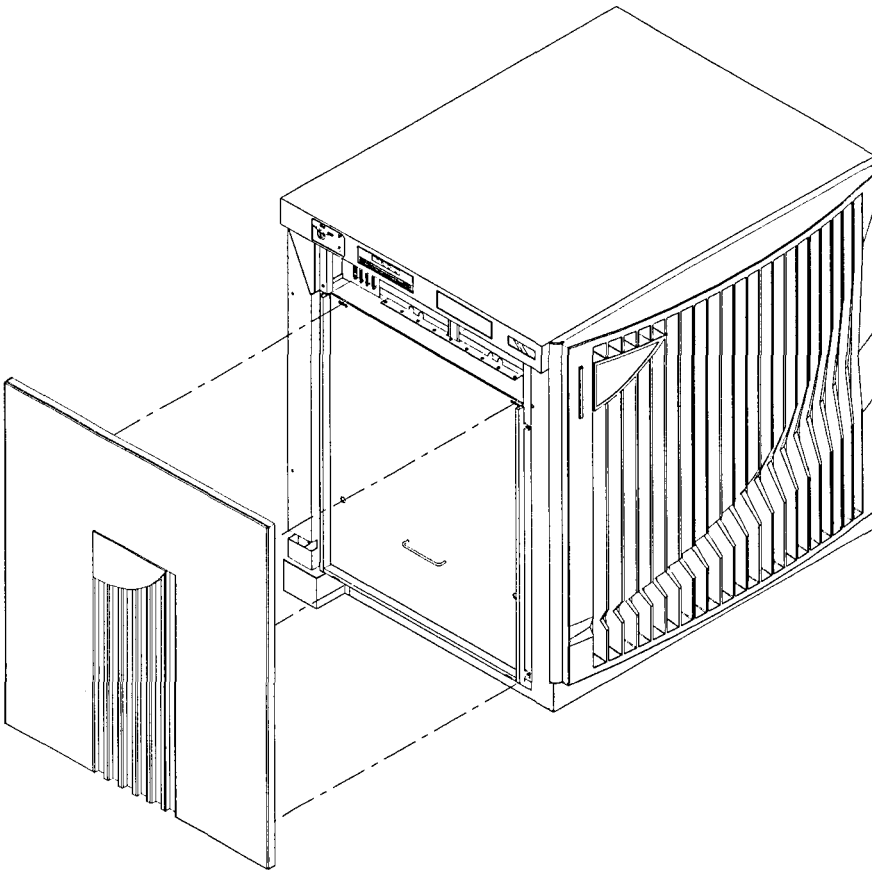
Disk Tray right drive configurations from the right top section of the chassis are covered in the "Disk Tray right removal" section on page 24.

Disk Tray left removal

This section shows how to remove the Disk Tray left to add a disk.

- Step 1** Remove the left side cabinet skin by pulling from the top and bottom of the skin until it pops out. The skin has a set of four catch pins that secure it to the chassis as shown in Figure 7.

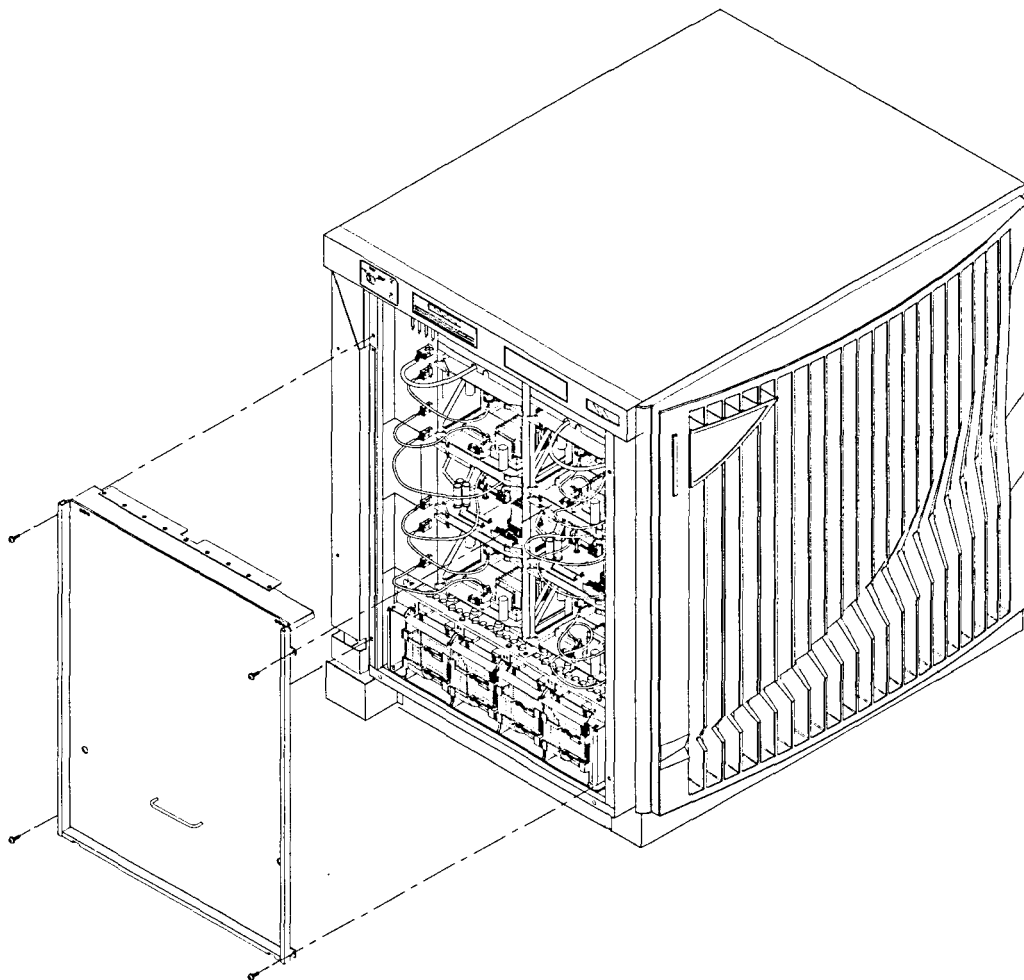
Figure 7 Side cabinet skin removal



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Step 2 Remove the EMI panel by removing four screws on the sides of the panel as shown in Figure 8.

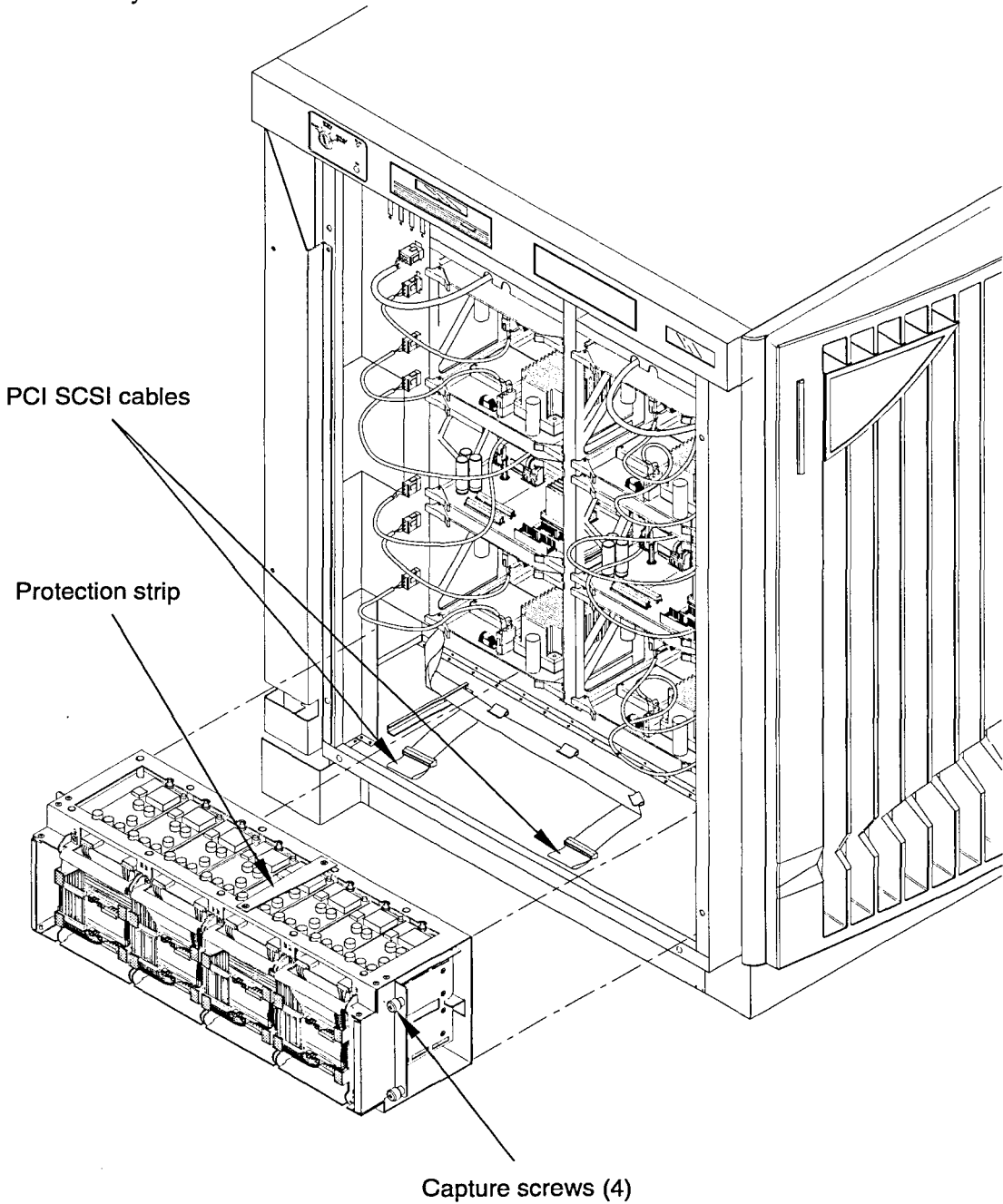
Figure 8 EMI panel removal



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Step 3 Locate the Disk Tray on the bottom left side of the chassis. Refer to Figure 9.

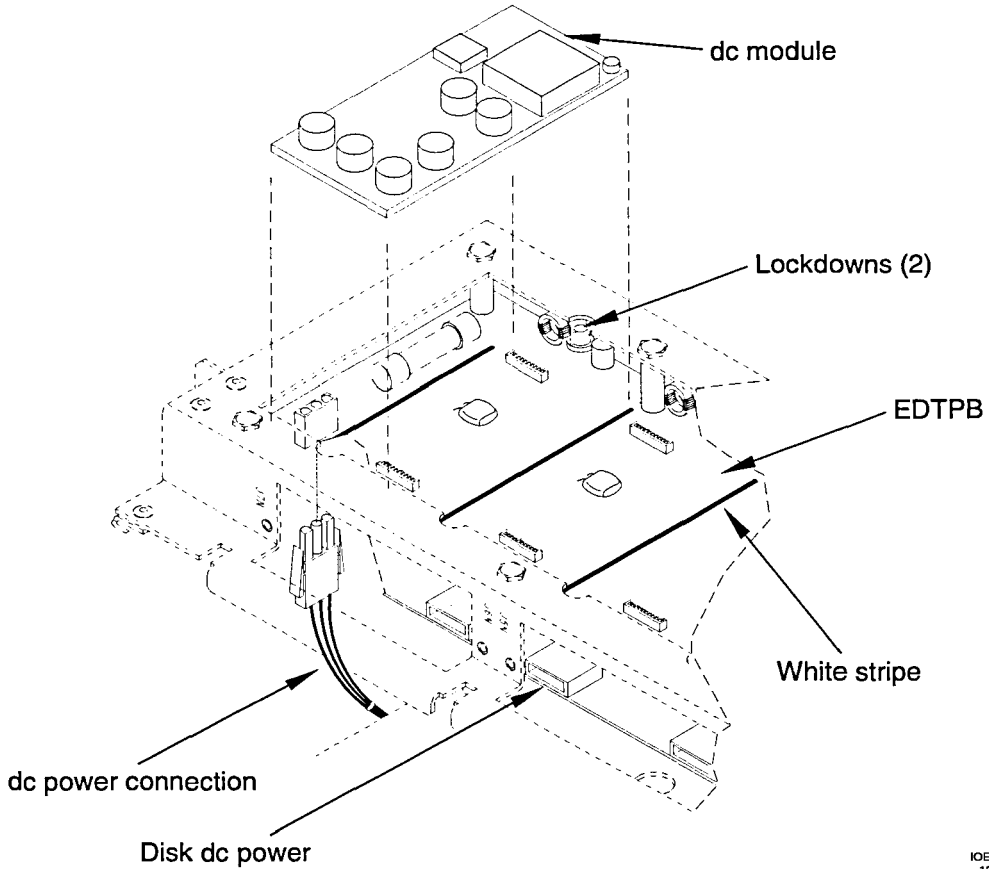
Figure 9 Disk Tray in chassis



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- Step 4** Disconnect the EDTPB dc power cable from underneath the Exemplar Disk Tray Power Board (EDTPB) located on top of the Disk Tray. This is located on the left side of the EDTPB. Refer to Figure 10 which shows a connection detail and the tray.

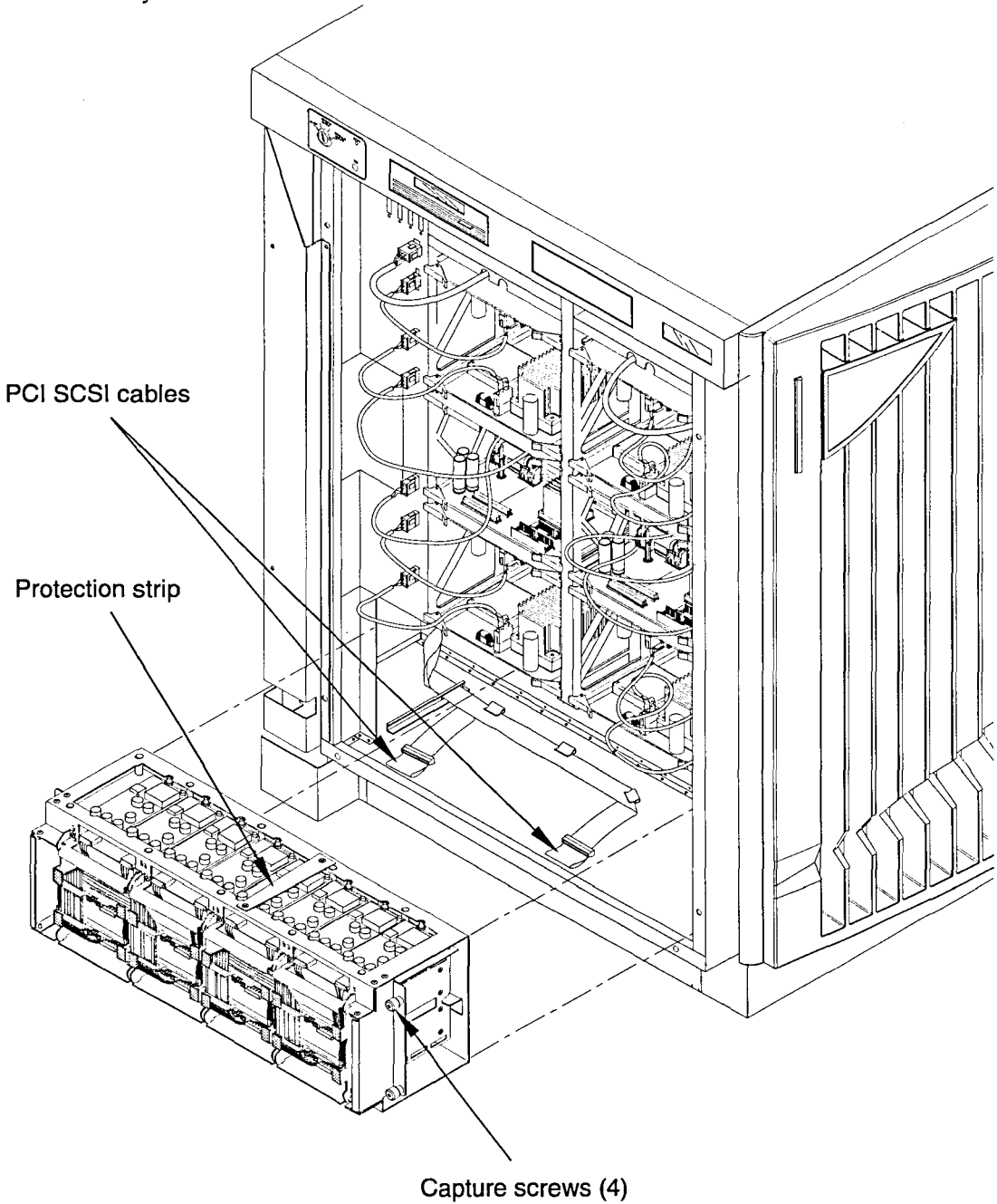
Figure 10 Disk Tray left with dc power detail



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- Step 5** Loosen the capture screws on both sides of the Disk Tray. Refer to Figure 11 on page 22 for capture screw location.
- Step 6** Remove the Disk Tray only enough to remove the PCI SCSI cables from Disk Tray A (DTLA) and B (DTLB). Use only the cable connector clips to remove the SCSI connectors to prevent damage to the cables. Refer to Figure 11 on page 22 for SCSI location.

Figure 11 Disk Tray Left in chassis



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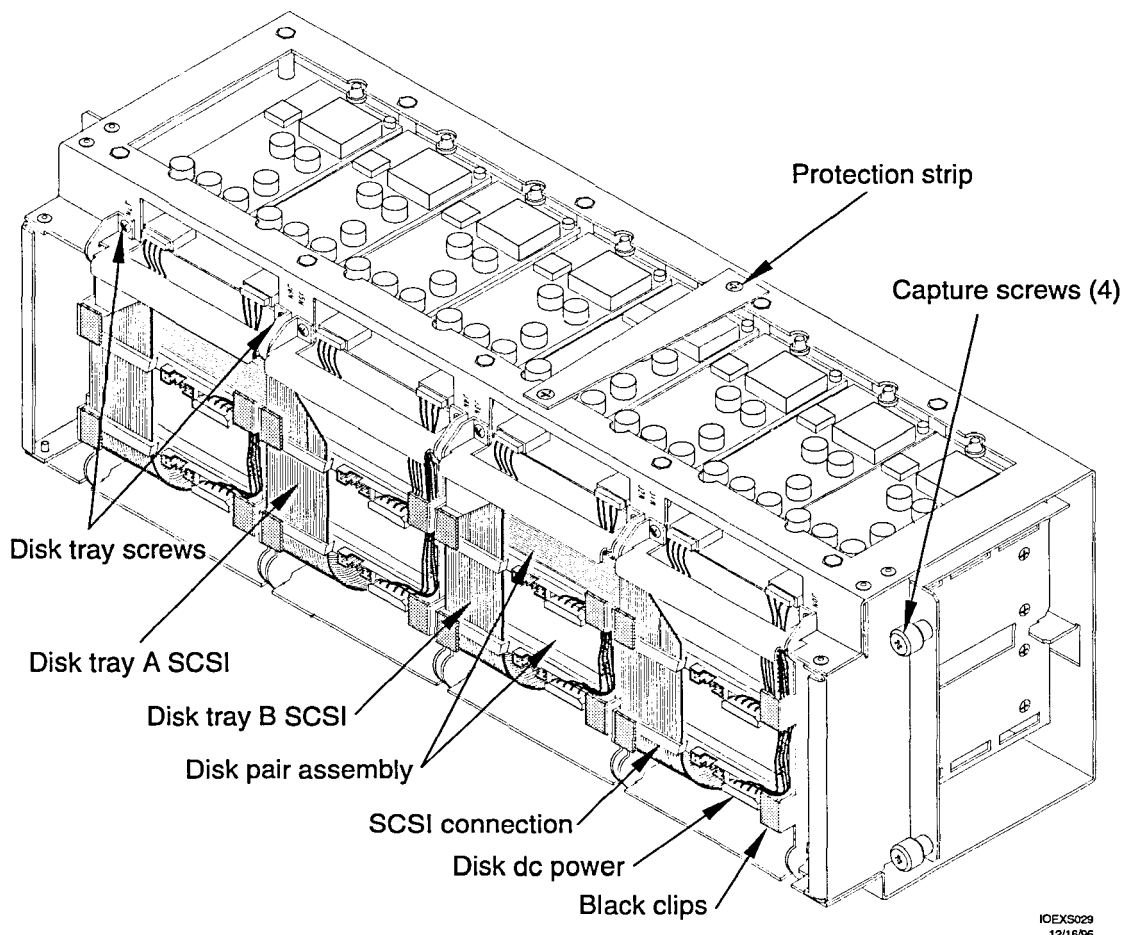
Step 7 Slide the Disk Tray out from the chassis using the power supply protection strip on the Disk Tray as a guide to remove the tray. Refer to Figure 11 on page 22 and Figure 12 for the location of the protection strip.

Caution

Do not pull too hard on the chassis as you pull it from the cabinet. Be sure not to lift up on the Disk Tray as it is pulled. The chassis should slide out of the cabinet along the protection strip provided on the Disk Tray. If it does not move easily, check the SCSI cables.

Step 8 Move the Disk Tray to a well-grounded work area to add the drive. Refer to the "Grounded work area" section on page xv if an area has not been set up.

Figure 12 Disk Tray removed from the chassis



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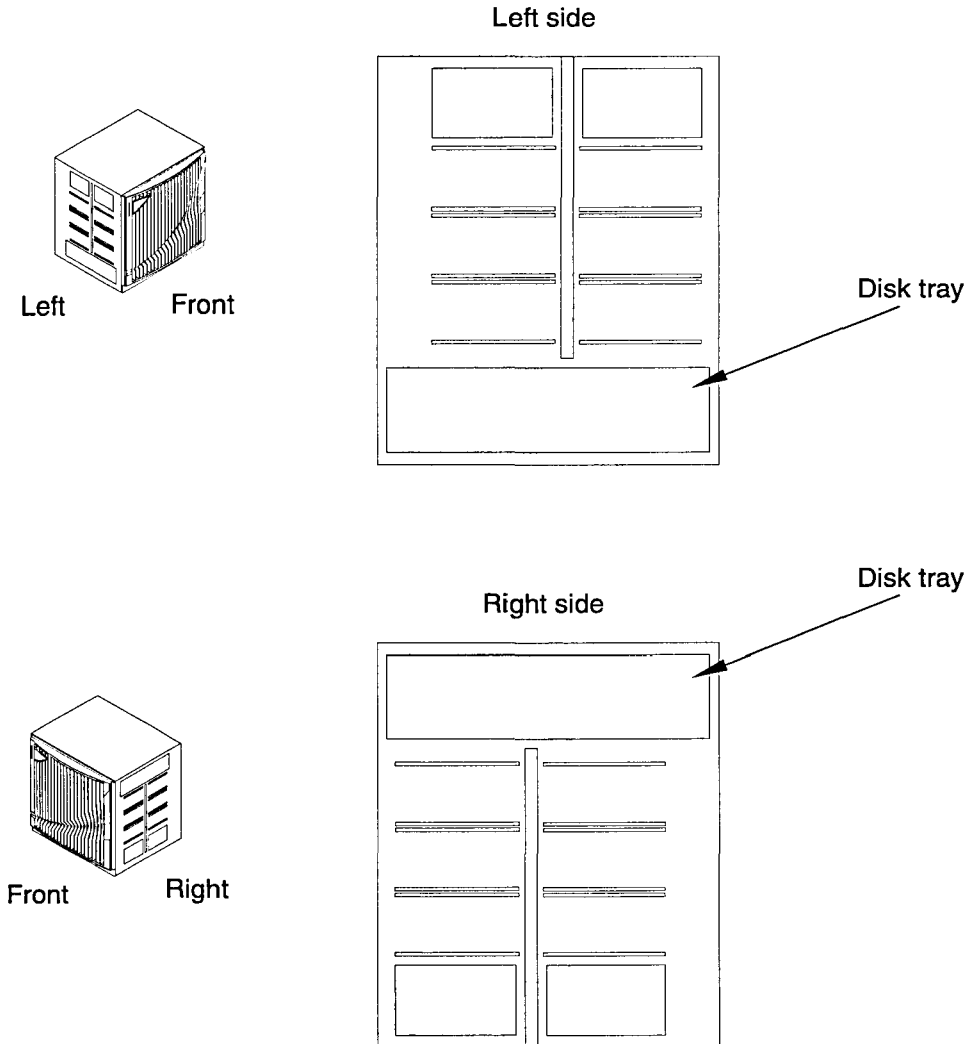
Disk Tray right removal

This section shows how to remove the Disk Tray right to add a disk. Refer to Figure 13 for the correct Disk Tray location.

Note

Removal of Disk Tray right is the same procedure as removal of Disk Tray left except it is at the top of the chassis on the right side and is upside-down.

Figure 13 Disk Tray location



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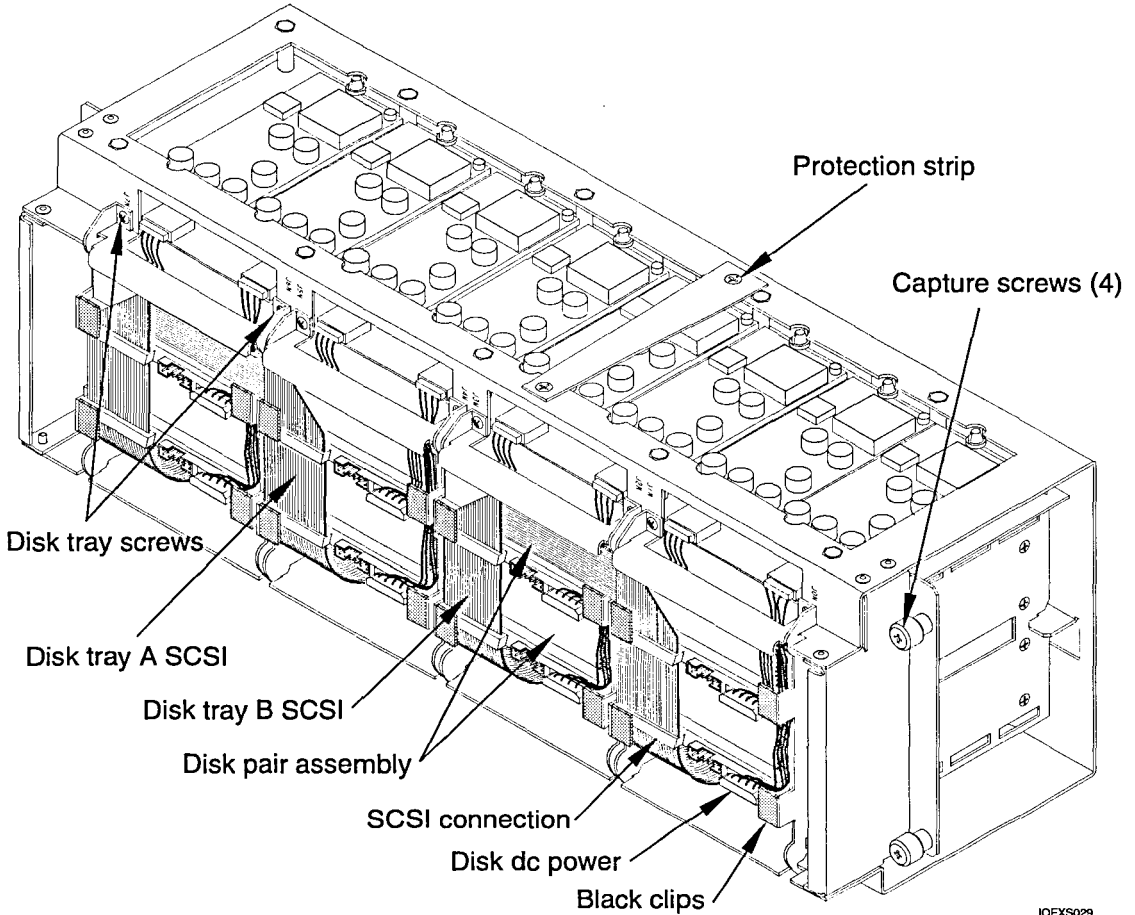
- Step 1** Remove the right side cabinet skin by pulling from the top and bottom of the skin until it pops out. The skin has a set of four catch pins that secure it to the chassis.
- Step 2** Remove the right EMI panel by removing four screws on the sides of the panel.
- Step 3** Locate the Disk Tray on the top right side of the chassis.
- Step 4** Disconnect the EDTPB dc power cable from the Exemplar Disk Tray Power Board(EDTPB) located on bottom section of the Disk Tray. This is located on the right side of the EDTPB.
- Step 5** Loosen the four capture screws on either side of the Disk Tray.
- Step 6** Remove the Disk Tray only enough to remove the PCI SCSI cables from Disk Tray A (DTRA) and B (DTRB). Use only the cable connector clips to remove the SCSI connectors to prevent damage to the cables.

Note

Use extreme care to remove the Disk Tray. It is installed upside-down in the right Disk Tray configuration and must be removed so as to not damage the EDTPB as it slides along the power supply protection strip.

Step 7 Slide the Disk Tray out from the chassis.

Figure 14 Disk Tray



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Step 8 Move the Disk Tray to a well- grounded work area. Refer to Figure 14 as a guide and turn the Disk Tray over with the EDTPB on top to work on adding a drive. Refer to the "Grounded work area" section on page xv if an area has not been set up.

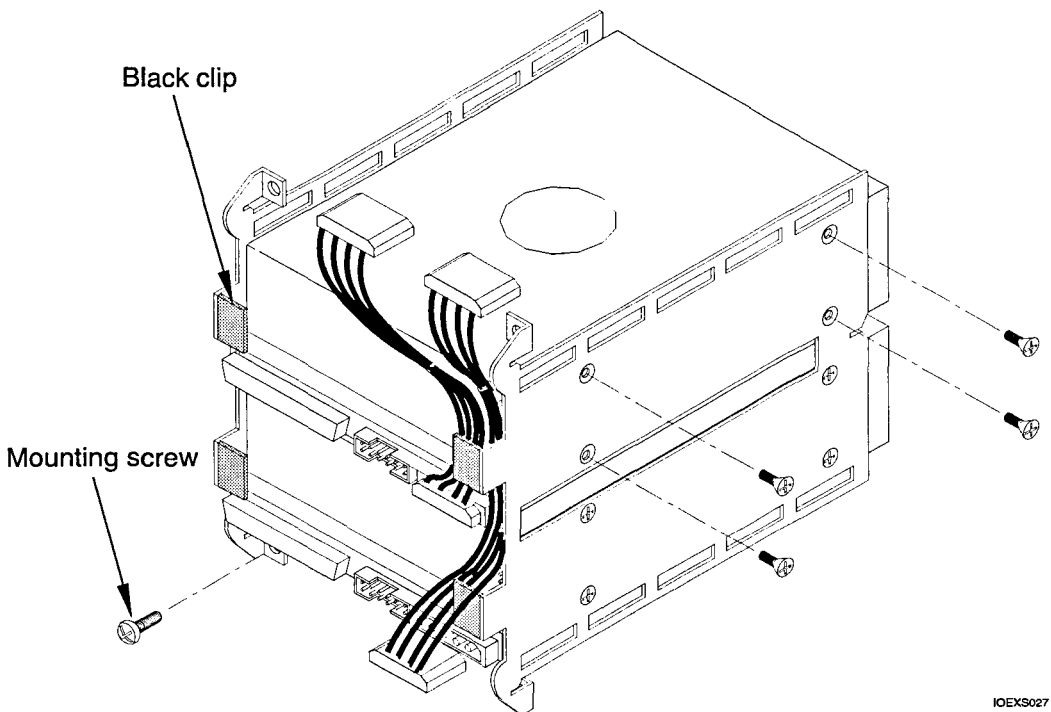
Disk pair assembly removal

With the Disk Tray on a grounded work area, perform the following steps to remove a Barracuda 9 pair assembly from the Disk Tray:

- Step 1** Disconnect the disk dc power cables from between the EDTPB and the disk pair assembly. Refer to Figure 15 on page 28 as a guide.
- Step 2** Remove the Disk Tray SCSI cables from disk pair assembly. Use only the cable connector clips to remove the SCSI connectors to prevent damage to the cables. Refer to Figure 14 on page 26.
- Step 3** Remove the two screws on the top and bottom of the disk pair assembly. Refer to Figure 15 on page 28.

- Step 4** Use the black clips as an aid to remove the disk pair assembly.
- Step 5** To add another drive, loosen the mounting brackets from the installed drive by loosen eight screws from the mounting bracket. Refer to Figure 15 for screw location.
- Step 6** Add the new drive to the open position in the disk pair and install eight screws and tighten all screws. Refer to Figure 15 for assistance.

Figure 15 Disk pair assembly removed from Disk Tray



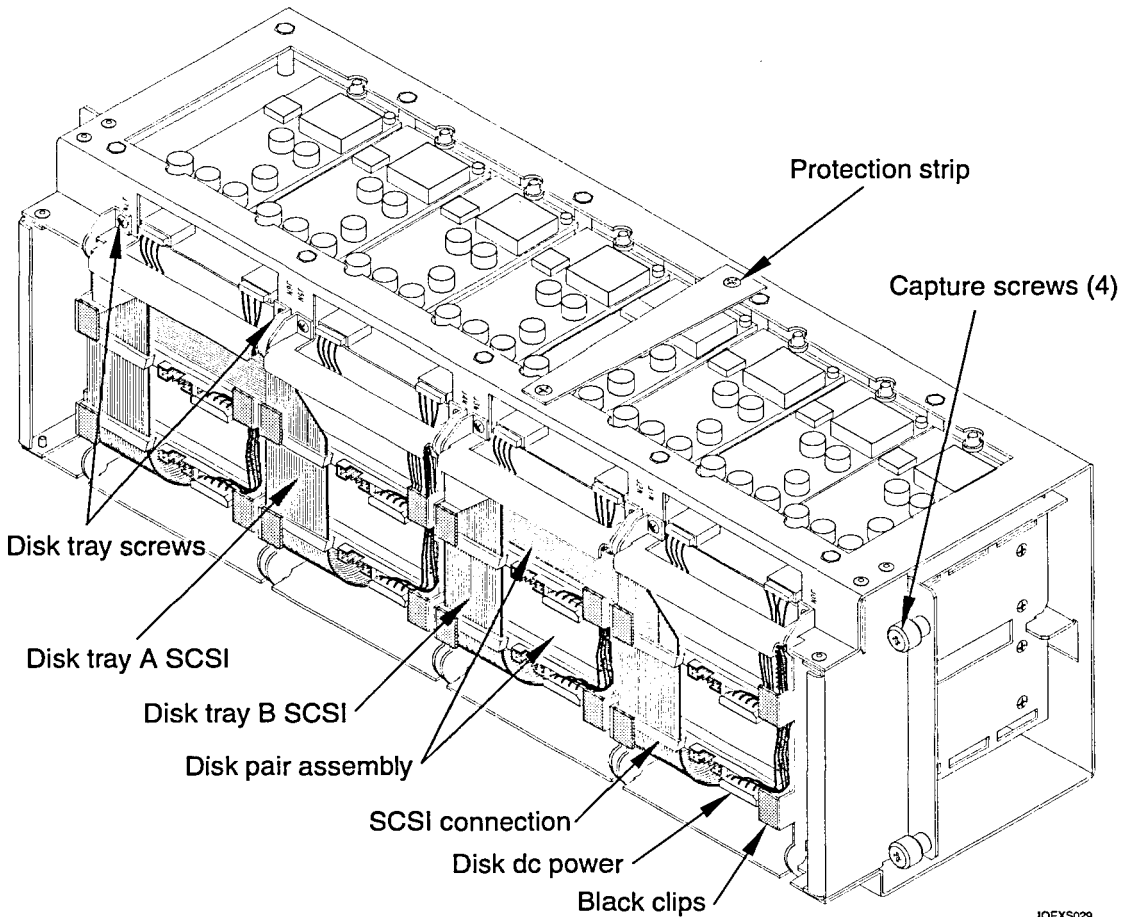
IOEXS027
12/12/96

Disk pair assembly installation

To add a disk pair to the Disk Tray follow the procedure below:

- Step 1** Install the disk drive pair carefully in the Disk Tray by using the black clips as an aid.
- Step 2** Install two screws at the top and bottom of the tray. Refer to Figure 16 below as a guide.

Figure 16 Disk Tray left removed from chassis



Step 3 Set the SCSI address to the correct ID by referring to Figure 17 for Disk Tray left configurations or Figure 18 for Disk Tray right configurations.

Figure 17 Disk Tray left configuration of SCSI IDs

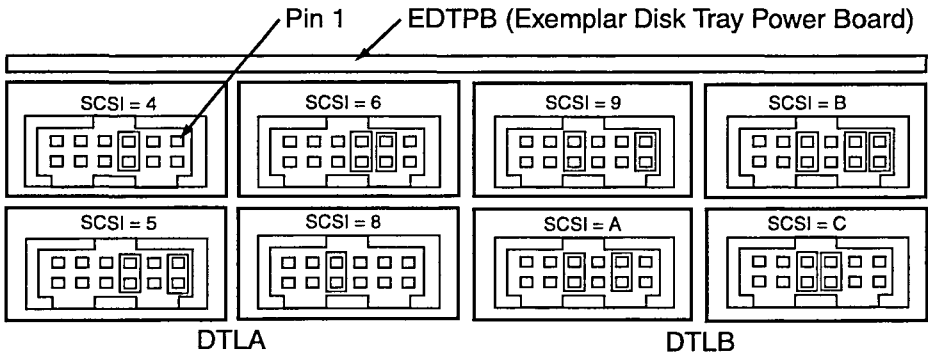
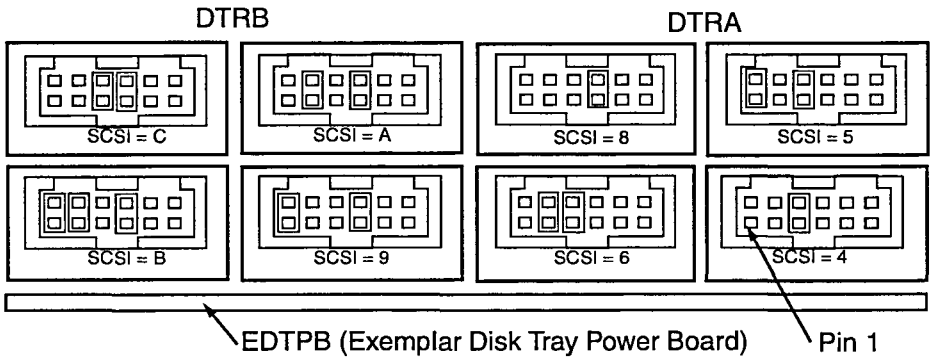


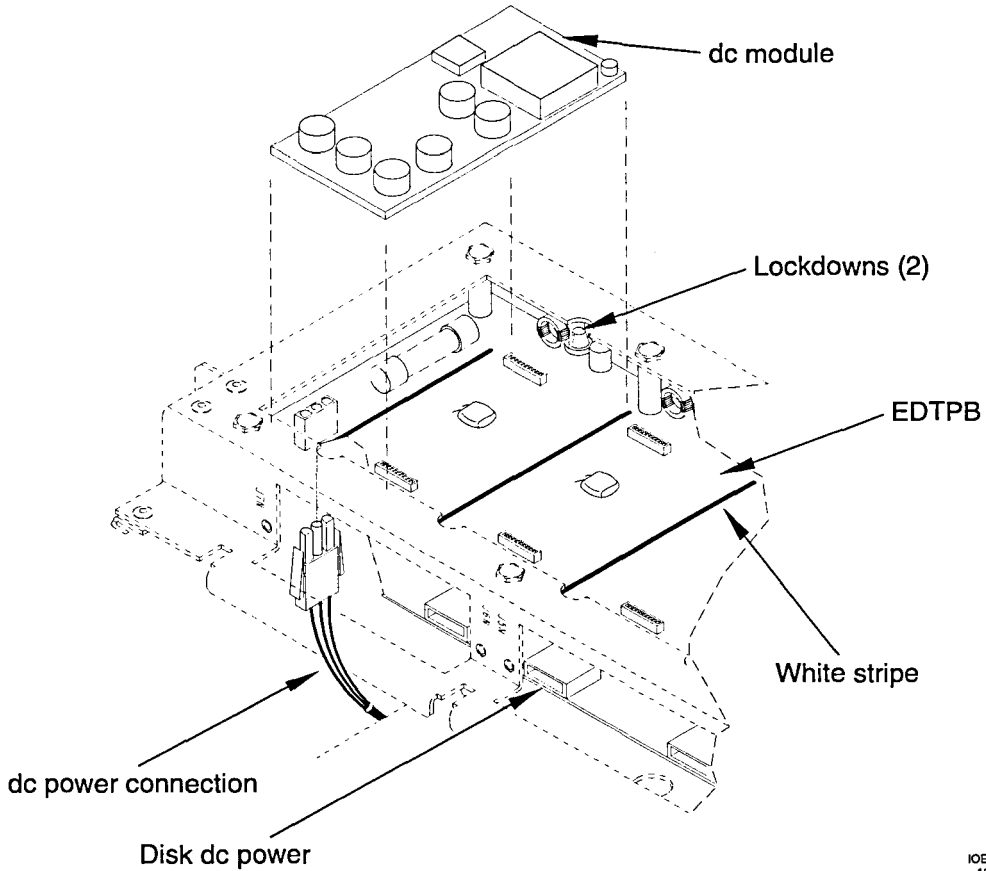
Figure 18 Disk Tray right configuration of SCSI IDs



In Figure 18 the viewer is looking at an upside-down view of the Disk Tray installed in the Disk Tray right configuration in the server.

- Step 4** Install a dc power module by first removing the power supply protection strip as shown in Figure 20 on page 32.
- Step 5** Align the dc module with the white stripe and secure by turning the lockdowns as in Figure 19.

Figure 19 EDTPB detail with dc module

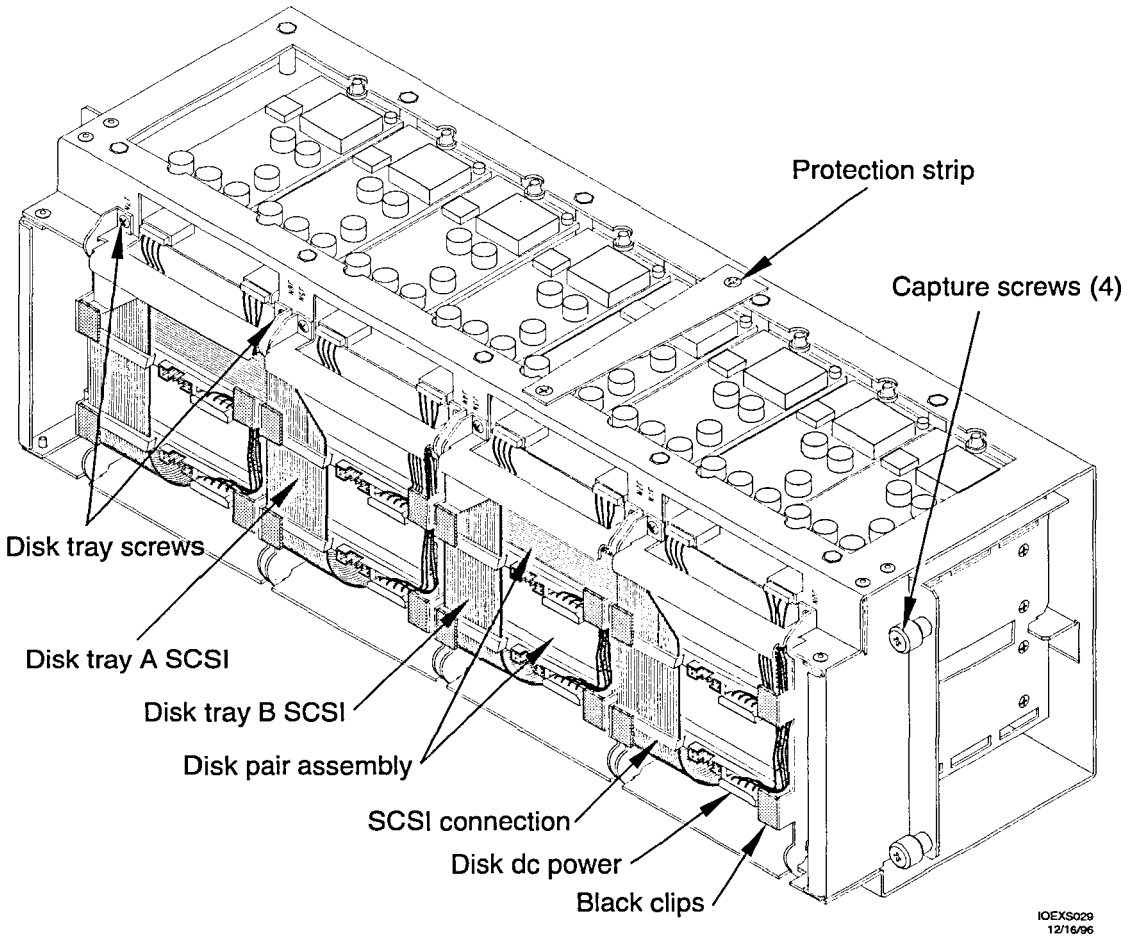


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- Step 6** Connect the disk dc power supply cable between the drive and the EDTPB. Refer to Figure 20 on page 32 as an aid.
- Step 7** Repeat steps 1 through 6 to install additional disk pairs.

- Step 8** Install the protection strip in its original location after all drives have been installed. Figure 20 shows the protection strip location on the Disk Tray.
- Step 9** Connect the Disk Tray SCSI cables to the disk pair assemblies as in Figure 20.

Figure 20 Disk Tray removed from chassis



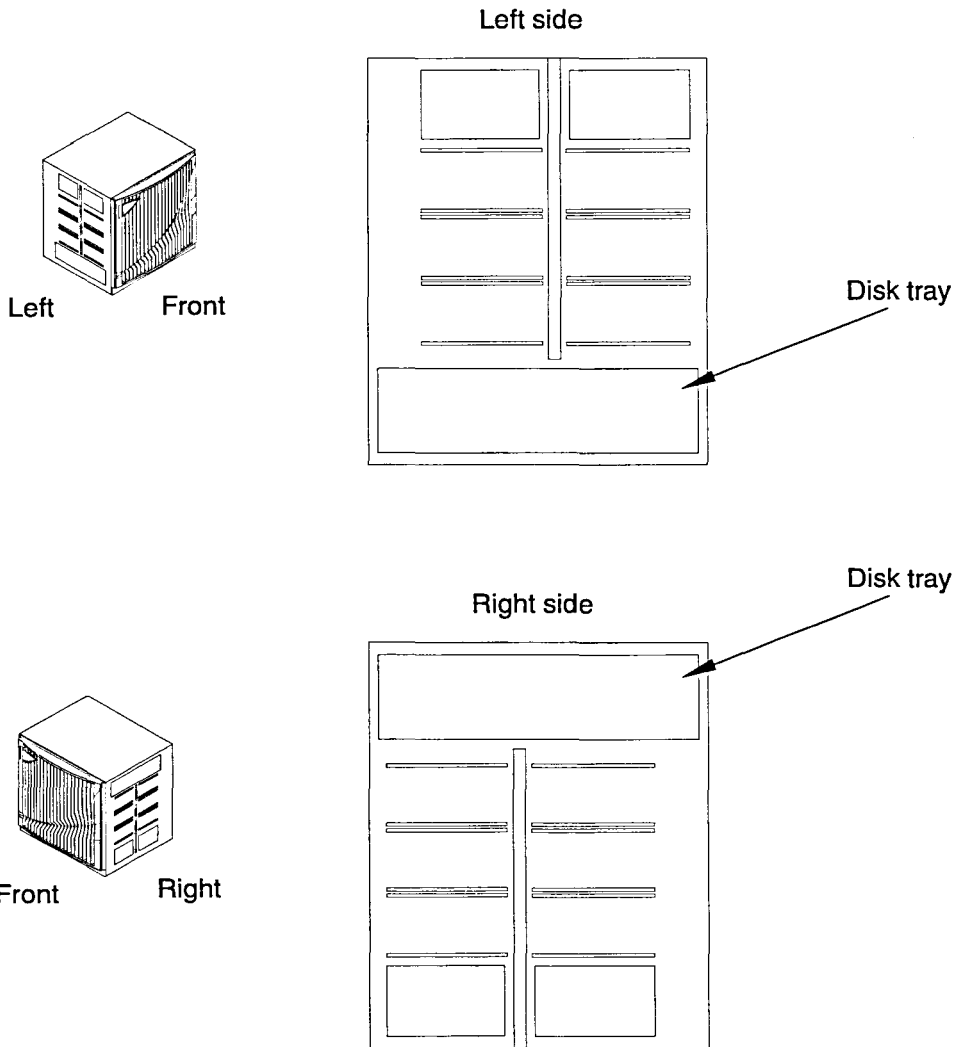
Disk Tray installation

Follow the procedure below to install the Disk Tray in either the Disk Tray left or Disk Tray right configuration:

Observe the Electrostatic discharge procedures described in the "Grounded work area" section on page xv to prevent damage to the drives and Disk Tray during installation.

- Step 1** Install the Disk Tray into the correct location of the chassis only enough to provide attachment of the PCI SCSI cables to the Disk Tray (DTRA) and (DTRB) or (DTLA) and (DTLB). Use the cable clips as an aid to avoid damage to the cables. Refer to Figure 21 and Figure 23 on page 35 for help.

Figure 21 Disk Tray location diagram



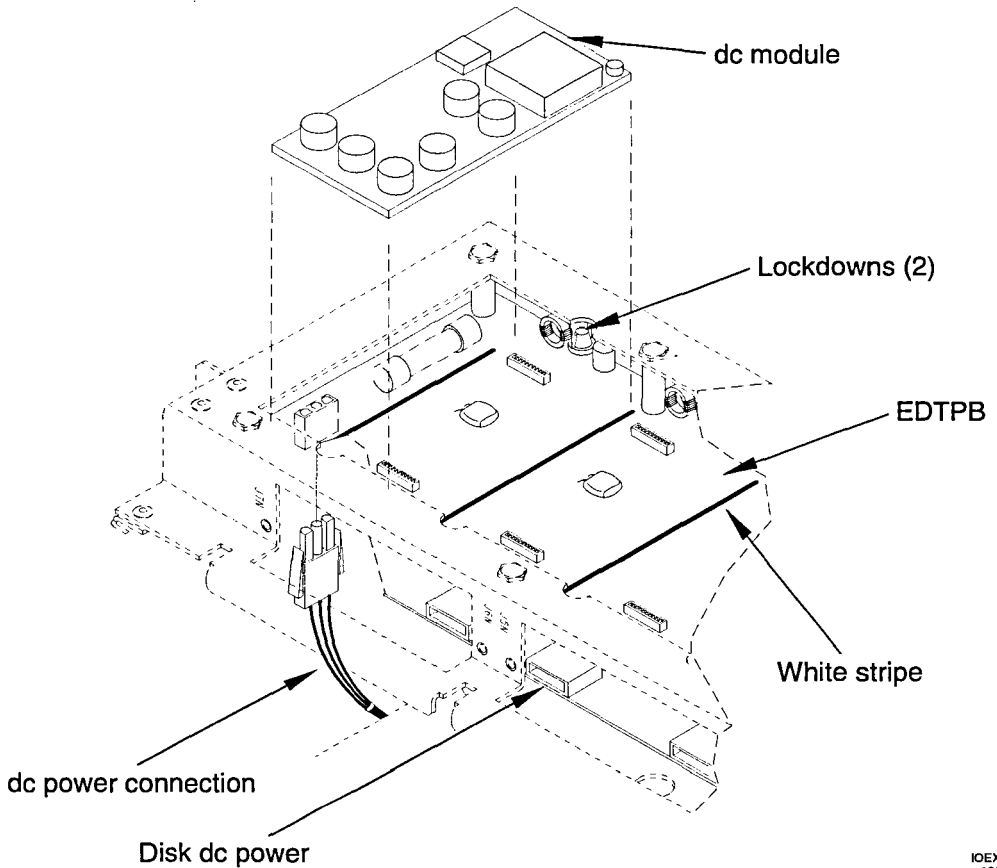
EXSM018
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Note

For a Disk Tray right configuration the Disk Tray is flipped and inserted upside down with the EDTPB on the bottom and the dc connection is on the right bottom of the Disk Tray.

Step 2 Attach the EDTPB dc power cable to the EDTPB. Refer to Figure 22 as a guide.

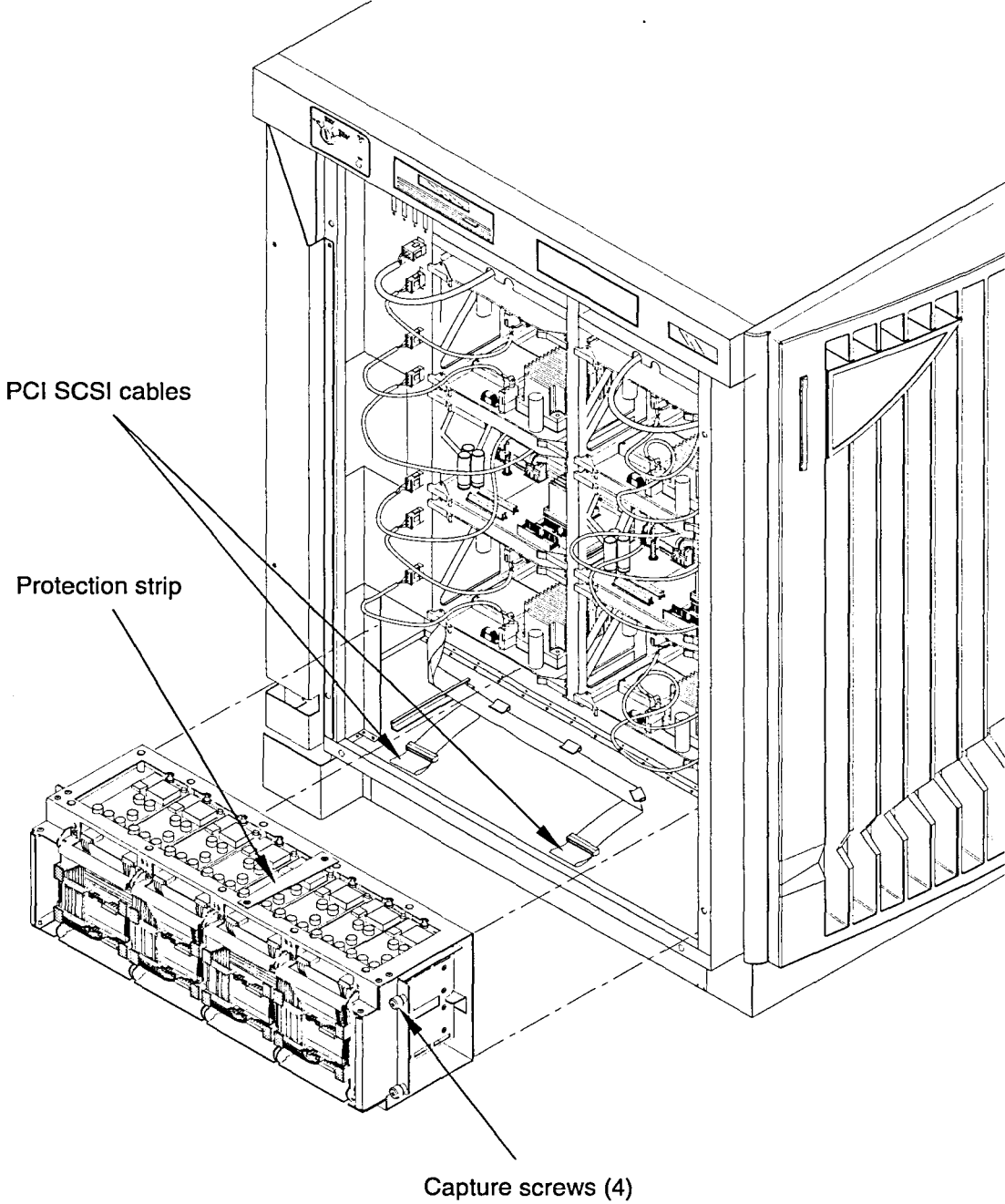
Figure 22 Detail of EDTPB showing dc power



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Step 3 Slide in the Disk Tray and tighten the capture screws. Refer to Figure 23 on page 35.

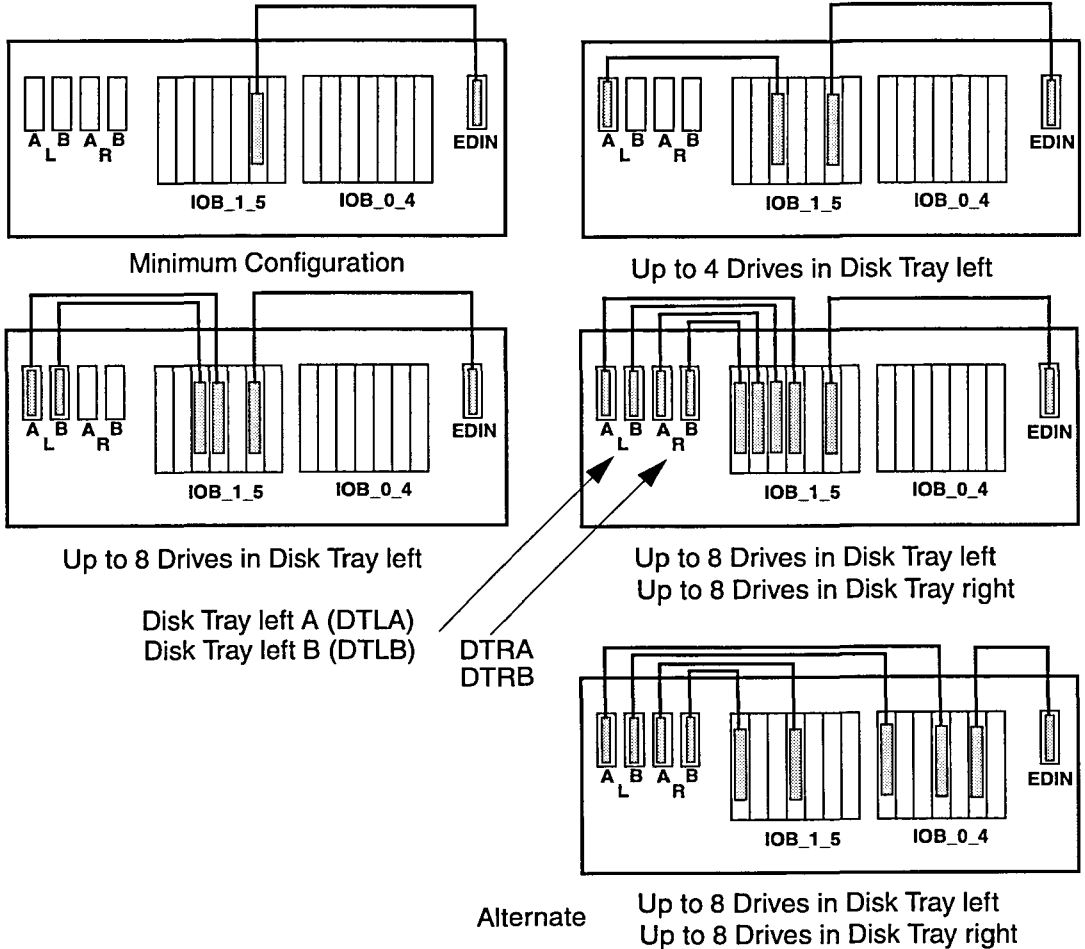
Figure 23 Disk Tray left location



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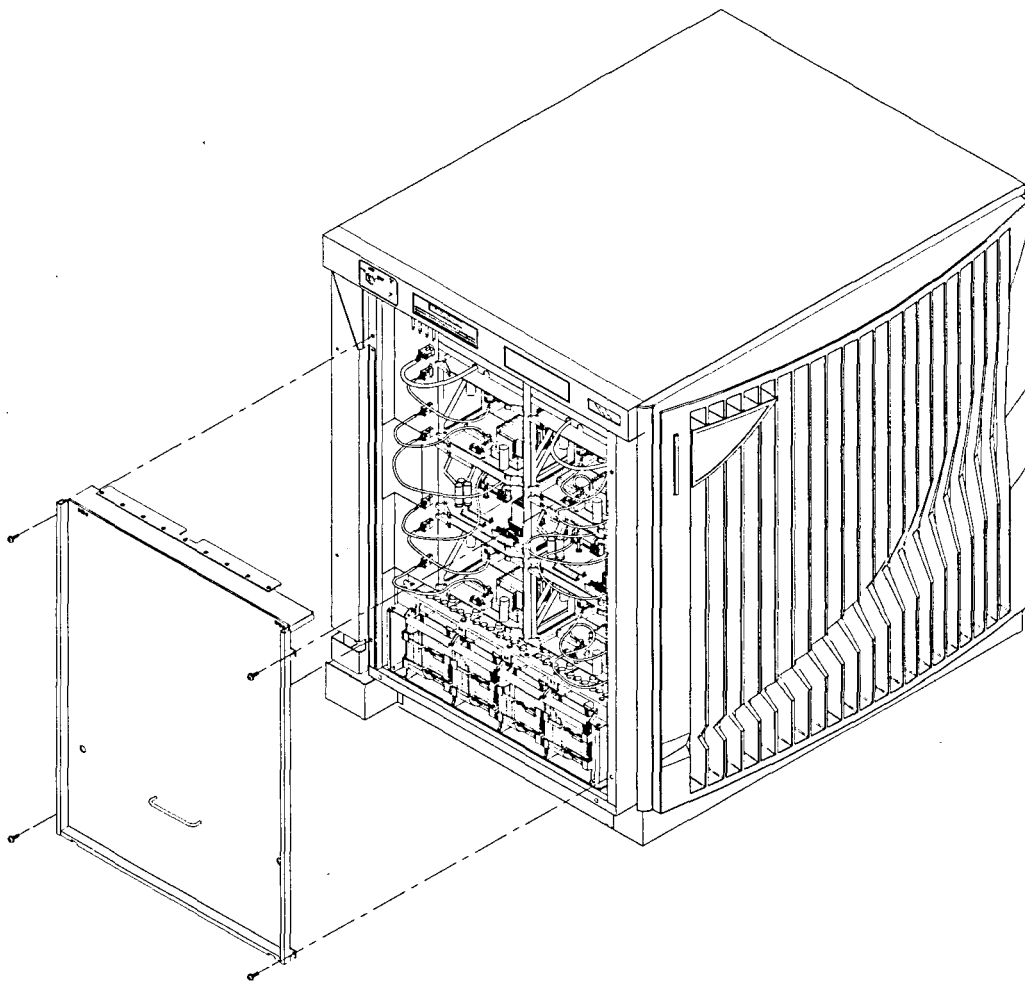
Step 4 Install additional SCSI cables between the bulkhead connectors, of the appropriate Disk Tray Right (DTRA) (DTRB) and or Disk Tray Left (DTLA) (DTLB) and the SCSI port on the PCI Card Cage. For the recommended configuration, refer to Figure 24.

Figure 24 Recommended configurations for SCSI ports



Step 5 Install the EMI panels by installing four screws as shown in Figure 25.

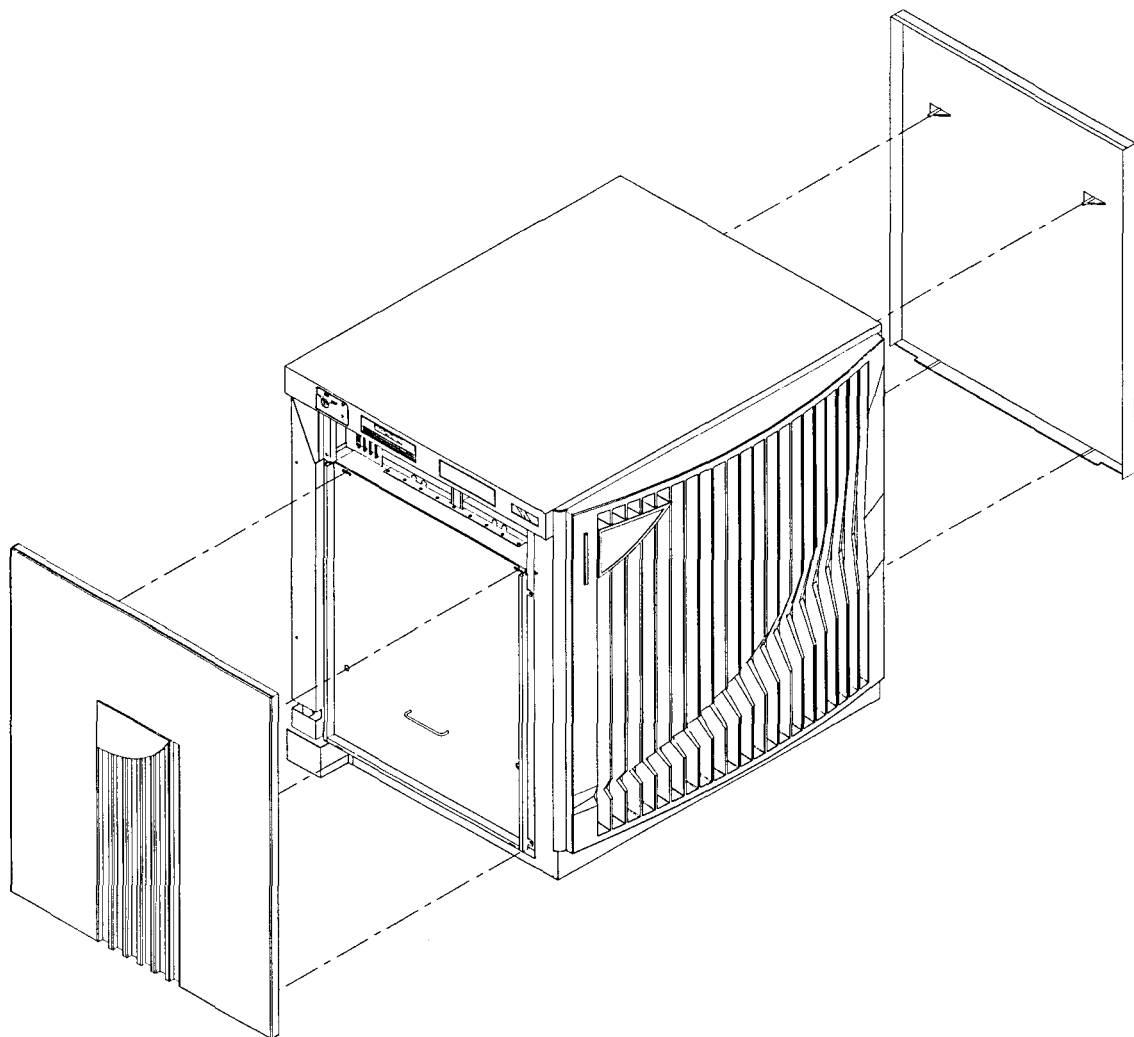
Figure 25 Installation of EMI panel



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Step 6 Secure the left or right side cabinet skin by locating the catch pins in the holes in the chassis. Refer to Figure 26 for location.

Figure 26 Cabinet skin installation



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Step 7 Integrate the drive into the server by following the instructions in the “Software integration” section on page 41.

Step 8 Check that the firmware revision on the drive is at least the same or newer on the new drive as the one already installed in the chassis. If the new drive does contain an older firmware revision, it must be updated. See the “Checking the firmware” section on page 43 in chapter 4.

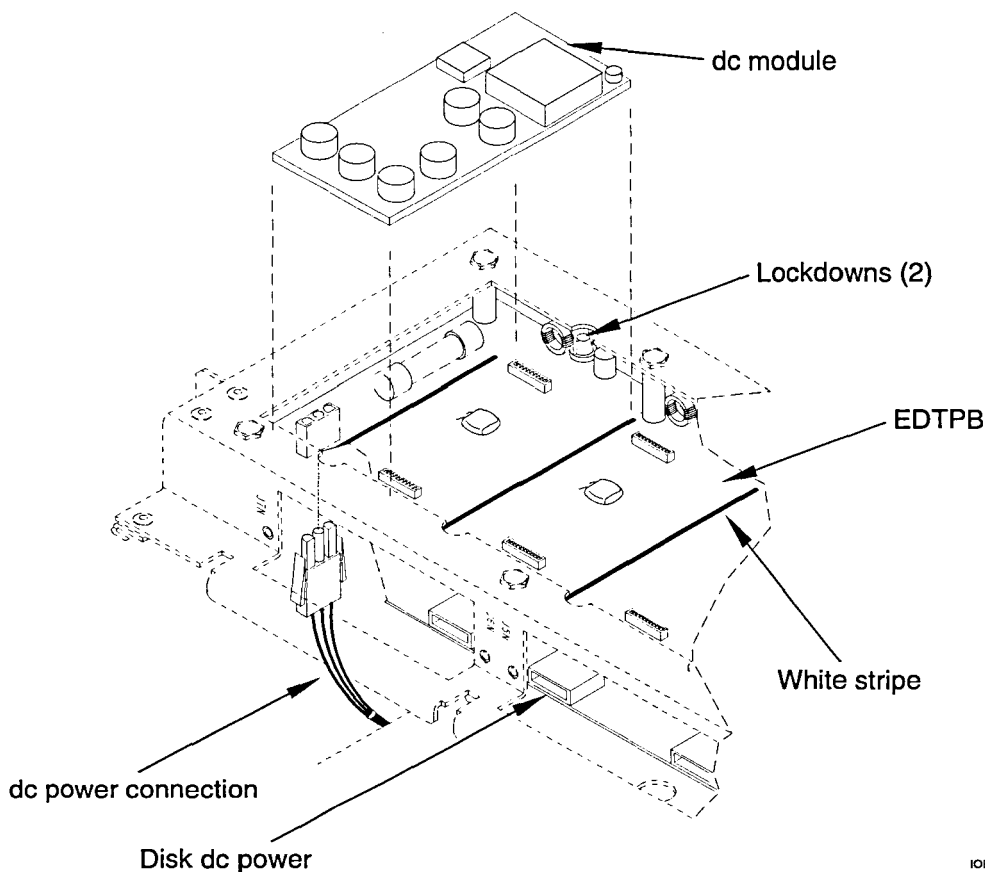
dc module installation

With the Disk Tray on a grounded work area, perform the following steps to add a dc power module with the new drive:

Observe the electrostatic discharge procedures described in the "Electrostatic discharge protection" section on page xv.

- Step 1** Remove the power supply protection strip from the Disk Tray to allow access to the EDTPB dc modules. Refer to Figure 27 for location.
- Step 2** Install the dc power module in the correct slot of the EDTPB in the orientation shown in Figure 27.

Figure 27 Detail of EDTPB with dc modules



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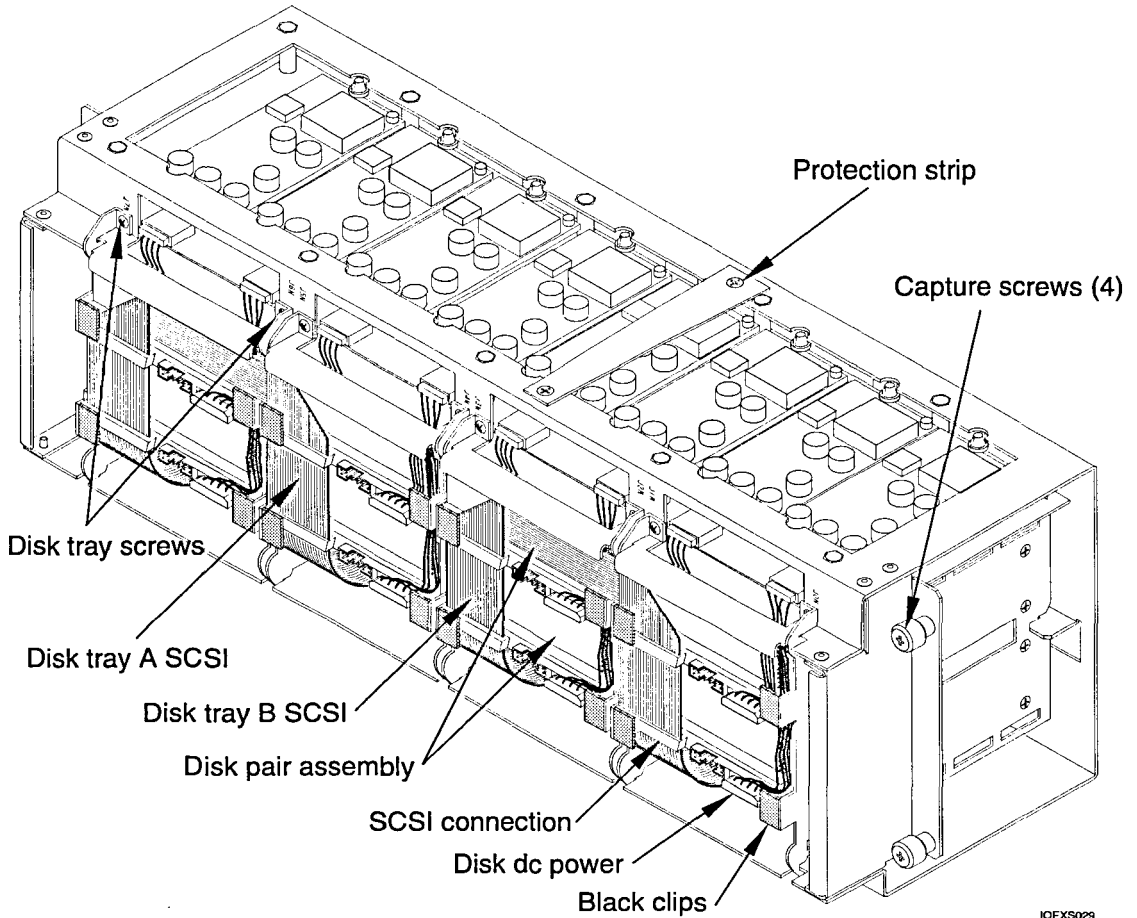
- Step 3** Check to see if the white stripe [Silk Screen] is visible next to the power module. The power module should not cover the white line.
- Step 4** Secure the dc module with the lockdown on each side of the board.

Step 5 Install the power supply protection strip in its original location as shown in Figure 28.

Caution

Do not install the module in the power board incorrectly or damage could result. The module must not overlap the white strip. If it does, the module should be rotated 180 degrees.

Figure 28 Disk Tray



IOEX5029
12/16/06

Software integration

This section contains a summary of procedures used to integrate a Barracuda 9 drive and descriptions of the system files that may require modification.

Use the following steps to integrate a Barracuda 9 Disk drive:

- Step 1** Boot SPP-UX to allow OBP to create a device path.
- After booting, the drive maps to a specific logical device name (for example, sd2). Device files are created and written to the physical device LIF directory.
- Step 2** Check mapping during the boot process by checking status messages printed to your screen as shown in the example below.

Example:

```
[62000001 001e2500] scsi disk: disk 0:0:4:0 attached mapped to sd17
[62000001 001e3288] scsi disk: disk 0:0:5:0 not mapped
```

Check mapping after the boot process by checking the system's event_log file, in /spp/data, for a record of all drives mapped during the boot process.

- Step 3** Log in as root on the server.
- Step 4** Start diskutil. Enter:
- ```
/usr/sbin/diskutil
```
- Step 5** Enter show disks to show available disks. Refer to the example below. Refer to the *SPP-UX Administration* manual for specific command line options and examples of diskutil.

**Example:**

```
SD 0:0:2:0 mapped to sd0
SD 0:0:3:0 mapped to sd7
SD 0:0:4:0 mapped to sd19
SD 0:0:5:0 mapped to sd16
SD 0:0:9:0 mapped to sd17
SD 0:0:10:0 mapped to sd1
```

← **Example output**

- Step 6** To change the disk to another logical device, use the `unmap` option of the `diskutil`. Enter `unmap disk` to unmap a disk. See the example below.

**Example:**

```
unmap disk SD 0:0:4:0
```

Example input

## Note

You will not be able to unmap a disk if its partitions are active. Use the `show partitions` option to check if the active partition is marked with an asterisk (\*) in the flags column and unmount the partition.

- Step 7** To set the logical name for a new disk device, enter the `map disk` option of the `diskutil`. See the example input below.

**Example:**

```
SD 0:0:2:0 mapped to sd0
SD 0:0:3:0 mapped to sd7
SD 0:0:4:0 unmapped
SD 0:0:5:0 mapped to sd16
SD 0:0:9:0 mapped to sd17
SD 0:0:10:0 mapped to sd1
```

Example output  
before map option

```
map disk SD 0:0:4:0 to sd19
```

Example input

- Step 8** Configure partitions with the `diskutil partition` command.
- Step 9** After creating the SPP-UX file systems, mount the drives for user access using the `/etc/mount` command.
- Step 10** View the `/etc/checklist` file to check the static information about the file systems.

This chapter describes how to verify and upgrade the Barracuda 9 disk drive firmware.

---

## Using `scsiutil`

Use `scsiutil` to verify or upgrade the firmware. `scsiutil` is a utility that allows you to access and control SCSI devices. It is generally used to perform tasks such as disk formatting, defect management, and, in this case, firmware upgrades. To invoke `scsiutil`, enter `scsiutil` at the SPP-UX command prompt.

---

### Checking the firmware

Verify that the firmware is at the correct revision level by following these instructions:

**Step 1** Enter `scsiutil` at the command prompt.

```
scsiutil
```

```
su 1>
```

**Step 2** Enter the `open` command to open the drive.

```
su 2> open<node#unitID#0>
```

This opens the device, a disk in this case. The device, vendor, and capacity is displayed.

**Step 3** Read the drive description information into the data buffer.

```
su 3> scr inq
```

#### Step 4 Display the contents of the data buffer

```
su 5> ddb 0 160
```

A complete example of the procedure for checking the firmware is shown below.

Look at the revision level at the end of the vendor line. In this example, the firmware is Revision 17.

#### Example:

```
su 1> op 0:0:6:0<cr>
```

```
Device node=0x0, path=0x0, target=0x6, lun=0x0 opened
Vendor: SEAGATE,Product: ST19171WD,Revision:0017
Capacity: 0194952832 bytes, (17783111 blocks, 512 bytes per block)
```

```
su 2> scr inq<cr>
su 3> ddb 0 160<cr>
```

```
node=0x0, path=0x2, target=0x6, lun=0x0:
00000000 00000202 8b00013e 53454147 41544520 ".....>SEAGATE"
00000010 53543139 31373157 20202020 20202020 "ST19171W"
00000020 30303137 4e383032 30343634 00000000 "0017N8020464....."
00000030 00000000 00000000 00000000 00000000 "....."
00000040 00000000 00000000 00000000 00000000 "....."
00000050 00000000 00000000 00000000 00000000 "....."
00000060 00436f70 79726967 68742028 63292031 ".Copyright (c) 1"
00000070 39393620 53656167 61746520 416c6c20 "996 Seagate All"
00000080 72696768 74732072 65736572 76656420 "rights reserved"
00000090 00000000 00000000 00000000 00000000 '.....'
```

---

## Check the revision

The revision should match the revision control document of HP-CXD TC (204-000047-350). If this matches, then proceed to the "Reallocation" section on page 47; otherwise, go to the "Downloading the firmware" section on page 45.

---

## Downloading the firmware

Use the following procedures to download the firmware:

**Step 1** Type in the firmware file to download.

```
su 3> down /etc/scsiutil_scr/firmware/<firmware_file>
```

Where <firmware\_file> = C9FW2017.LOD  
for firmware rev 17.

**Step 2** Type in the following steps to check if the firmware has been updated.

```
su 4> scr tur
```

This gives you an error the first time.

Wait approximately 20 seconds before attempting this command again. Up to five `scr tur` commands may be required before this passes.

```
su 5> scr tur
```

This passes the fifth time.

```
SU 6> scr inq
```

Checks to see if the firmware has been updated.

## Note

For a screen example of a firmware update see below.

**Example:**

```
Peripheral qualifier: 0x0
Peripheral device type: 0x0
RMB: 0x0
Device-type modifier: 0x0
ISO version: 0x0
ECMA version: 0x0
ANSI-approved version: 0x2
AENC: 0x0
TrmIOP: 0x0
Response data format: 0x2
Additional length: 0x8b
RelAdr: 0x0
WBus32: 0x0
WBus16: 0x1
Sync: 0x1
Linked: 0x1
CmdQue: 0x1
SftRe: 0x0
Vendor id: SEAGATE
Product id: ST19171W
Product rev: 0017
```

**Revision  
level**



---

## Reallocation

Enter the following commands to set auto\_allocation:

- Step 1** Select all open drives.  
`su 1> sel -o`
- Step 2** Set the auto\_allocation.  
`su 2> scr auto_realloc`

---

## Format the drive

To change the firmware type for the drive, enter:

```
su 9> format -s 512
```

---

## Load default mode sense values

Enter the following commands to load the default values, clear mode data length, and save the default values:

- Step 1** Load the default values.  
`su 10> script mode_sense BF D0`
- Step 2** Clear mode data length.  
`su 11> mdb 0x0 0`
- Step 3** Save the default values.  
`su 12> script mode_select 11 D0`



This chapter contains troubleshooting information, maintenance precautions, removal and replacement procedures, and a list of field replacement units (FRU) on a Barracuda 9 disk drive used in the Disk Tray configuration.

---

## Troubleshooting

This section gives general guidelines for diagnostics, repair of sector errors, and formatting the drive for the Exemplar S-Class and X-Class Server Barracuda 9 disk drive.

---

### Preparation

Observe the electrostatic discharge procedures described in the “Electrostatic discharge protection” section on page xv, to prevent damage to the peripheral devices.

The Barracuda 9 used as a disk in the Disk Tray is a single Field Replaceable Unit (FRU) and does not contain any field-serviceable parts. Troubleshooting procedures described in this section are limited to verifying that the disk is operational and a valid connection is established.

---

### Checking disk connections in the Disk Tray

Check the cable connections, EDTPB, and dc modules by using this check list:

- Step 1** Check the SCSI cable between the PCI SCSI Controller and the bulkhead connector for Disk Tray connections.
- Step 2** Check the PCI SCSI cable between the bulkhead connector and the Disk Tray.

- Step 3** Check the Disk Tray A and Disk Tray B SCSI cables between the disks of the Disk Tray.
- Step 4** Check the PCI SCSI terminators on Disk Tray A and Disk Tray B SCSI cables.
- Step 5** Check the disk dc power cable(s) between the disk pair assembly and the Exemplar Disk Tray Power Board (EDTPB).
- Step 6** Check the EDTPB dc power cable attached to the EDTPB.
- Step 7** Check the dc power LEDs on the EDTPB.
- Step 8** Check the dc modules of the EDTPB for proper installation.

---

### After visual inspection

If the visual inspection does not reveal any problems, or if an action taken as a result of the inspection does not produce a working Disk Tray disk:

- Step 1** Verify the firmware revision by referring to the "Checking the firmware" section on page 43 of Chapter 4.
- Step 2** From the obp command prompt enter:
- ```
obp>show children
```
- This command will show the disk, if you can talk to the SCSI control, and the SCSI control can talk to the disk.
- ```
obp>list
```
- This command shows if all the directories are present on the disk.
- Step 3** Run diagnostics to determine whether the PCI Ultra SCSI controller can communicate with the Disk Tray disk. Diagnostics are described in the next section.
- If the diagnostics determine that the controller and or disk is defective, replace the controller and or disk.
- Step 4** Contact your local Hewlett-Packard customer representative or call the Technical Assistance Center at one of the following locations for information on replacing and repairing the disk or controller:
- Within the continental U.S., call 1 (800) 952-0379.
  - From Canada, call 1 (800) 345-2384.
  - All others, contact your local Hewlett Packard sales office.

---

## Diagnostics Overview

If you are still experiencing problems and suspect that the PCI Ultra SCSI controller or SCSI cable may be malfunctioning, perform a diagnostic check of the interface to determine whether it is operational. To run these diagnostics, reboot the system to the system Test Controller in stand-alone mode and run the `ctest` utility.

The `ctest` utility provides a graphical interface to the diagnostic environment. Diagnostics that test the SCSI interface to the Disk Tray disk and other SCSI devices are located in the io3000 suite of diagnostics. The io3000 diagnostic suite is organized into *classes*. Within each class there are one or more diagnostic *subtests*. The Class 3 EPIC PCI Access Test for testing the controller and the Class 4 Qlogic Mailbox Test could be run to verify the controller and firmware before running the SCSI diagnostics.

Refer to the *Exemplar Diagnostics Guide: S-Class and X-Class Servers*. For specific information on the io3000 diagnostics suite, refer to the io3000(1) man page.

The SCSI diagnostic class is called the Class 5 SCSI Interface Test.

The Class 5 SCSI Interface diagnostic consists of five subtests:

- SCSI Test Unit Ready Test
- SCSI Inquiry Test
- SCSI Read Capacity Test
- SCSI Read Test
- SCSI Write Test

## Note

**In order for the SCSI Write Test to write data to the disk, make sure the write enable option is on.**

The SCSI Test Unit Ready Test is the most basic SCSI command. Its purpose is to verify that the disk is operational (ready to allow medium access). No actual SCSI data phase occurs in this test. If this test fails, it indicates that the PCI SCSI controller is unable to talk to the Disk Tray disk and there is a SCSI cable or Disk Tray disk problem.

The SCSI Inquiry Test verifies that the inquiry command works and that the device is really a disk. Data in phase occurs in this test. If this test fails the SCSI cable is not connected to the correct device

The SCSI Read Capacity Test checks the ability to do a read capacity from the Disk Tray disk. Data in phase occurs in this test. Failure of this test indicates a bad SCSI cable to the Disk Tray disk or a Disk Tray disk problem.

The SCSI Read Test determines if the Disk Tray disk can be read through the SCSI cable. Data in phase occurs but no verification of data is done in this test. Failure of this test indicates a Disk Tray disk problem.

The SCSI Write Test determines whether data can be written to the disk. This test will not actually write data to the disk unless the write option for this disk is turned on. The Write Protect jumper on pins 9 and 10 of the Disk Tray disk must not be installed on jumper block J2 in order for this test to pass.

For a complete description of `cxtest` and the Test Controller diagnostic environment, refer to the *Exemplar Diagnostics Guide: S-Class and X-Class Servers*. For specific information on the io3000 diagnostics suite, refer to the io3000(1) man page.

---

## Running SCSI interface diagnostics

To run the SCSI Interface diagnostics, perform the following steps:

- Step 1** From the Test Station, reboot the system so that it boots the Test Controller in stand-alone mode instead of OBP. For specific instructions on booting the system to the Test Controller and operating in the diagnostic environment, refer to the *Exemplar Diagnostics Guide: S-Class and X-Class Servers*.
- Step 2** Execute `cxtest` :  
`/spp/bin/cxtest -d`
- Step 3** In the Tests menu, select io3000 to display the io3000 Class Menu dialog.
- Step 4** In the Class Menu dialog, select Class 5 SCSI Interface tests. When you select a class, you select all the subtests within that class. You can also select specific subtests within a class by selecting the subtest button.
- Step 5** From the Class Menu dialog, select the Parameters button to specify the parameters of the test(s). The parameters are as follows:

### *Epic*

This parameter identifies the EPIC where the PCI Ultra SCSI controller resides. Valid entries can be any of the values from the first column in Table 8.

**Table 8 EPIC and PCI slot numbering**

| Parameter to enter | EPIC      | PCI slots | Description                  |
|--------------------|-----------|-----------|------------------------------|
| IOLF_B             | 0 (rear)  | 0, 1, 2   | Left front EIOB, rear EPIC   |
| IOLF_A             | 4 (front) | 0, 1, 2   | Left front EIOB, front EPIC  |
| IOLR_B             | 1 (rear)  | 0, 1, 2   | Left rear EIOB, rear EPIC    |
| IOLR_A             | 5 (front) | 0, 1, 2   | Left rear EIOB, front EPIC   |
| IORF_B             | 3 (rear)  | 0, 1, 2   | Right front EIOB, rear EPIC  |
| IORF_A             | 7 (front) | 0, 1, 2   | Right front EIOB, front EPIC |
| IORR_B             | 2 (rear)  | 0, 1, 2   | Right rear EIOB, rear EPIC   |
| IORR_A             | 6 (front) | 0, 1, 2   | Right rear EIOB, front EPIC  |

*Controller*

This parameter identifies the PCI slot number of the controller. There are 3 possible slot numbers per EPIC to choose from as described in Table 8 or use 0xf. 0xf signifies that the device specification is unused.

*Target device number*

The target device number of the device (SCSI ID), expressed in hexadecimal. The SCSI ID for the Disk Tray disk is usually set by the "Jumper block J1-A SCSI Target IDs" section on page 6 in Chapter 1.

*Logical Unit Number*

The logical unit number of the device, expressed in hexadecimal. The default parameter for the Disk Tray disk is set to 0.

- Step 6** Click the Done button to close the Class Menu dialog.
- Step 7** Select Go from the Command menu to execute the tests. The following message appears in the Console window:  
 Execution Starting.  
 .....
- Step 8** If the test completes (successfully or unsuccessfully), the console window displays the following message:  
 Execution Completed.

If the test fails, an error message is displayed. For a complete description of error messages, refer to the io3000 man page and the *Exemplar Diagnostics Guide: S-Class and X-Class Servers*.

---

## Sector errors

Repair of header CRC or data ECC errors can be accomplished only by reformatting the entire disk.

Before reformatting a disk with `scsiutil` running from SPP-UX, the disk's file system must be unmounted.

For additional help about the use of `scsiutil`, refer to the `scsiutil(1)` man page.

---

## Formatting the Barracuda 9 disk drive with `scsiutil`

The Disk Tray disk drive can be formatted and maintained using the `scsiutil` utility. This version runs under the SPP-UX OS as root. Consult the online man page for `scsiutil(1D)` or the *Exemplar S-Class and X-Class Diagnostics Manual* for more information. This utility program:

- Formats disk drives.
- Writes CXD-specific topology data to disk.
- Allows access to disk defect lists.
- Provides an interface for direct communications with SCSI devices.

## Note

Some commands in `scsiutil` are data destructive. Refer to the `scsiutil(1D)` man page for a detailed description of `scsiutil`.

The Disk Tray disk drive is formatted before shipping to the customer site. Although it should not be necessary to reformat a drive, reformatting can be accomplished with the `scsiutil` `format` command.

The `scsiutil` utility is invoked by typing its name at the SPP-UX OS command prompt:

```
scsiutil
```

This command formats the drive with 512 bytes.

```
su 1> format -s 512
```

The `scsiutil` utility does not have a *verify format* option.

---

## Caution

---

Do not use the `format` option if you wish to recover data from the disk drive. Using the `format` option of the `scsiutil` command destroys any existing files on the disk drive.

---

## Preparation

When the Barracuda 9 is used as a Disk Tray disk drive, it can be replaced or removed as described in the next sections. Follow the procedures below to prepare to service a disk in the Disk Tray.

Use appropriate electrostatic discharge protection procedures as described in the "Grounded work area" section on page xv.

---

## Caution

---

**Do not remove power from a Barracuda 9 disk drive used in the Exemplar S-Class and X-Class Servers until you have halted the SPP-UX OS by using the `/etc/shutdown` command. To do so otherwise may cause a server crash and loss of data.**

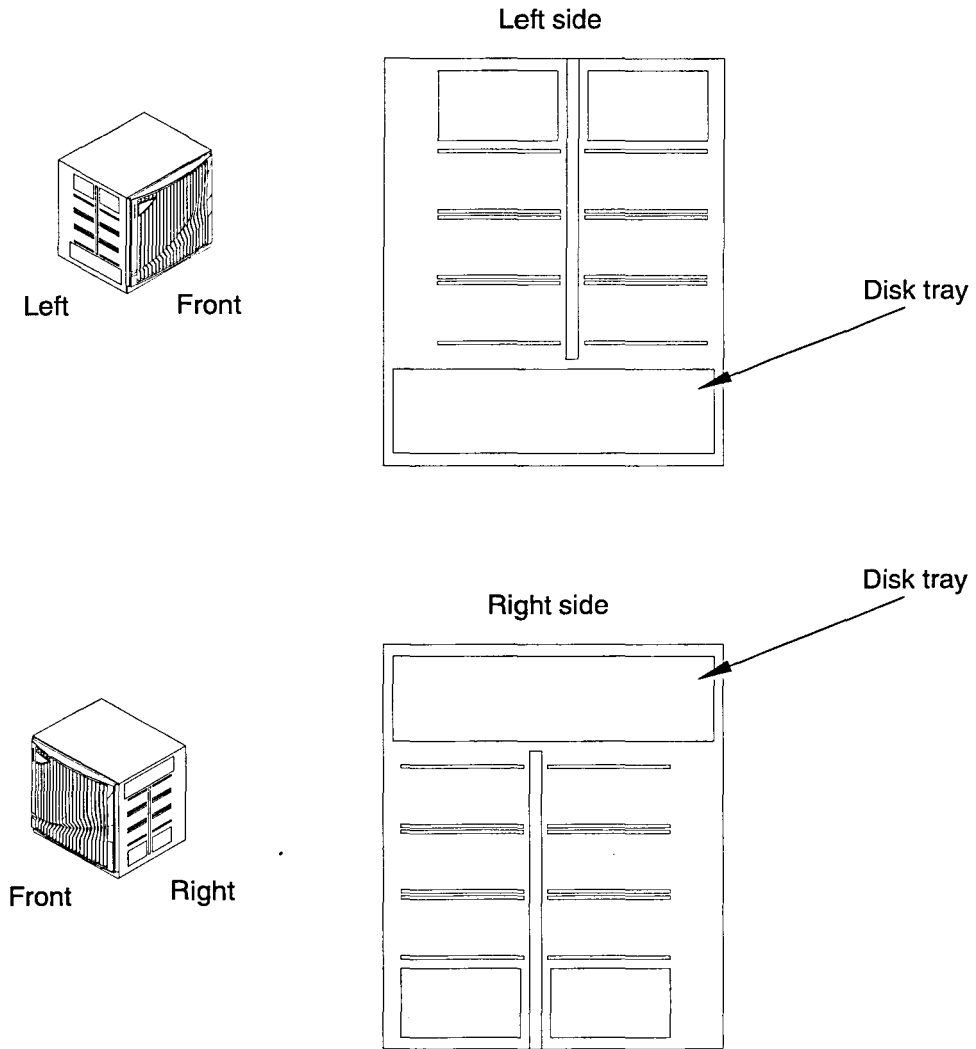
- Step 1** Shut down the system with the `etc/shutdown` command.
- ```
/etc/shutdown -h <time>
```

The `time` argument can be used to schedule a timed shutdown or the keyword "now" can be used to shut down the system immediately. Refer to the *SPP-UX System Administration Guide* or the `shutdown(8)` man page for more information on `/etc/shutdown`.

- Step 2** Power down the Exemplar chassis by turning the key switch located on the left panel by the DAT drive to the OFF position

Step 3 Check the configuration diagram below and locate the Disk Tray.

Figure 29 Location of Disk Tray left and right



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Disk Tray removal

To remove disks, the Disk Tray must be removed. Depending on the location of the disk to be serviced follow the procedures below

Note

Disk Tray left drive configurations from the left bottom section of the chassis are covered in the next section on "Disk Tray left removal" section on page 58.

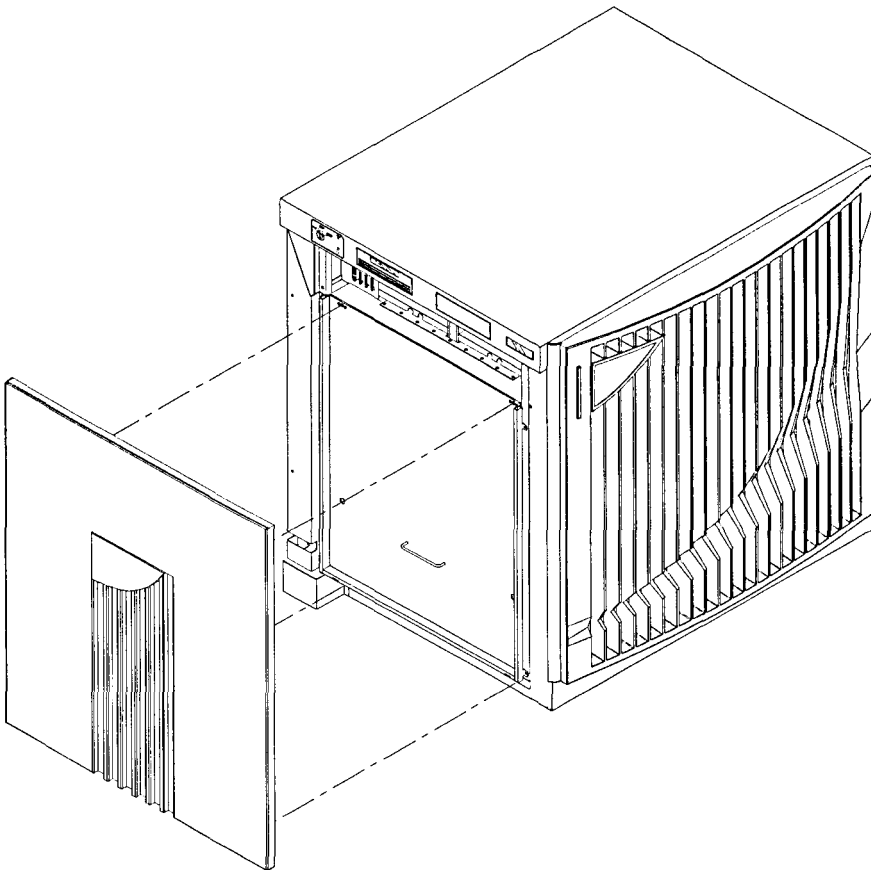
Disk Tray right drive configurations from the right top section of the chassis are covered in the "Disk Tray right removal" section on page 63.

Disk Tray left removal

This section shows how to remove the Disk Tray left.

- Step 1** Remove the left side cabinet skin by pulling from the top and bottom of the skin until it pops out. The skin has a set of four catch pins that secure it to the chassis. Refer to Figure 30.

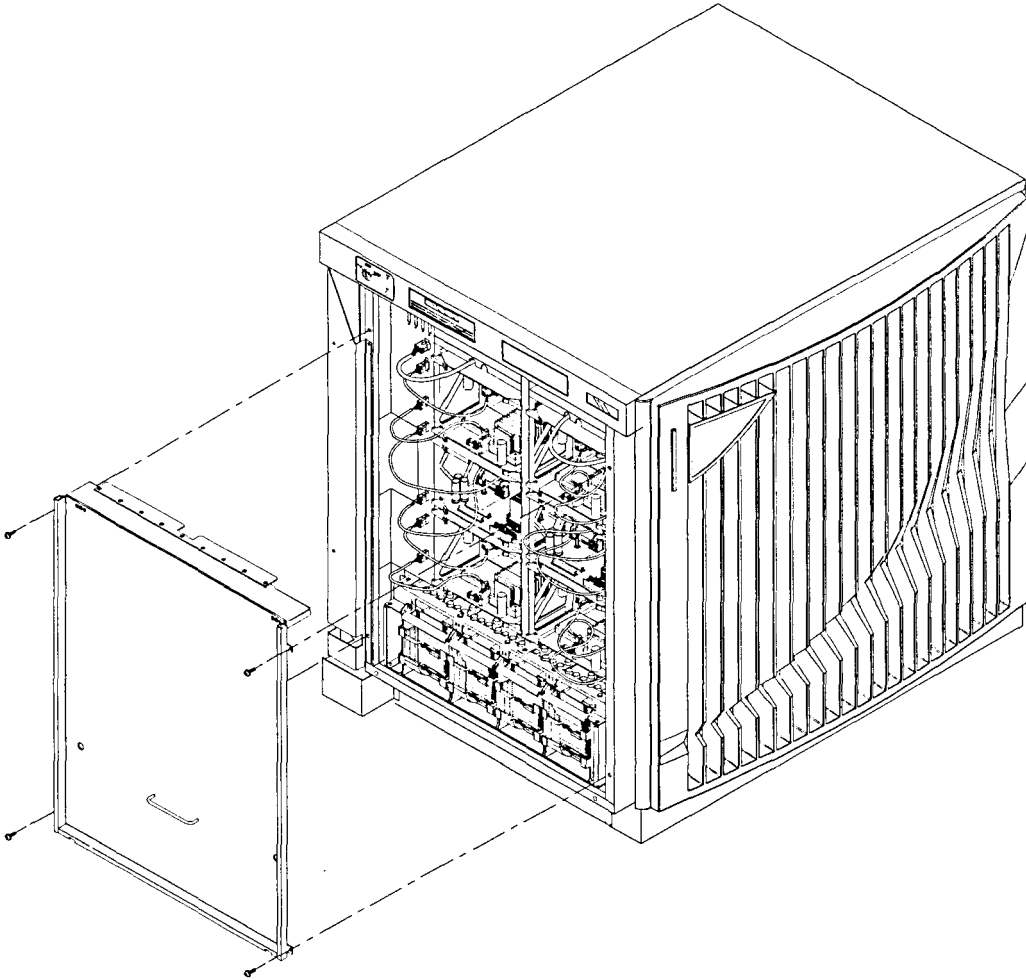
Figure 30 Side skin removal



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12/5/06

- Step 2** Remove the EMI panel by removing the four screws on the sides of the panel as shown in Figure 31.
- Step 3** Locate the Disk Tray on the bottom left side of the chassis. Refer to Figure 33 on page 61 as a guide.

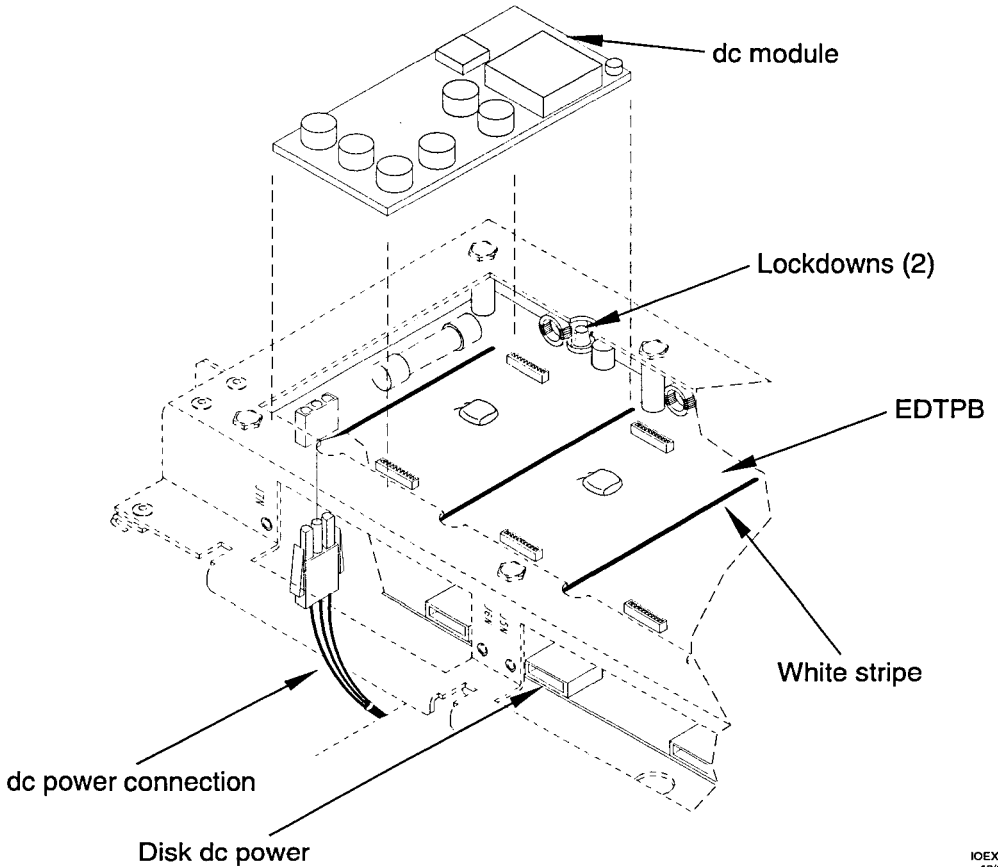
Figure 31 EMI panel removal



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- Step 4** Disconnect the dc power cable from underneath the Exemplar Disk Tray Power Board (EDTPB) located on top of the Disk Tray. This should be on the left side of the EDTPB. Refer to Figure 32 for a connection detail and the tray.

Figure 32 Detail of EDTPB and dc power disconnect

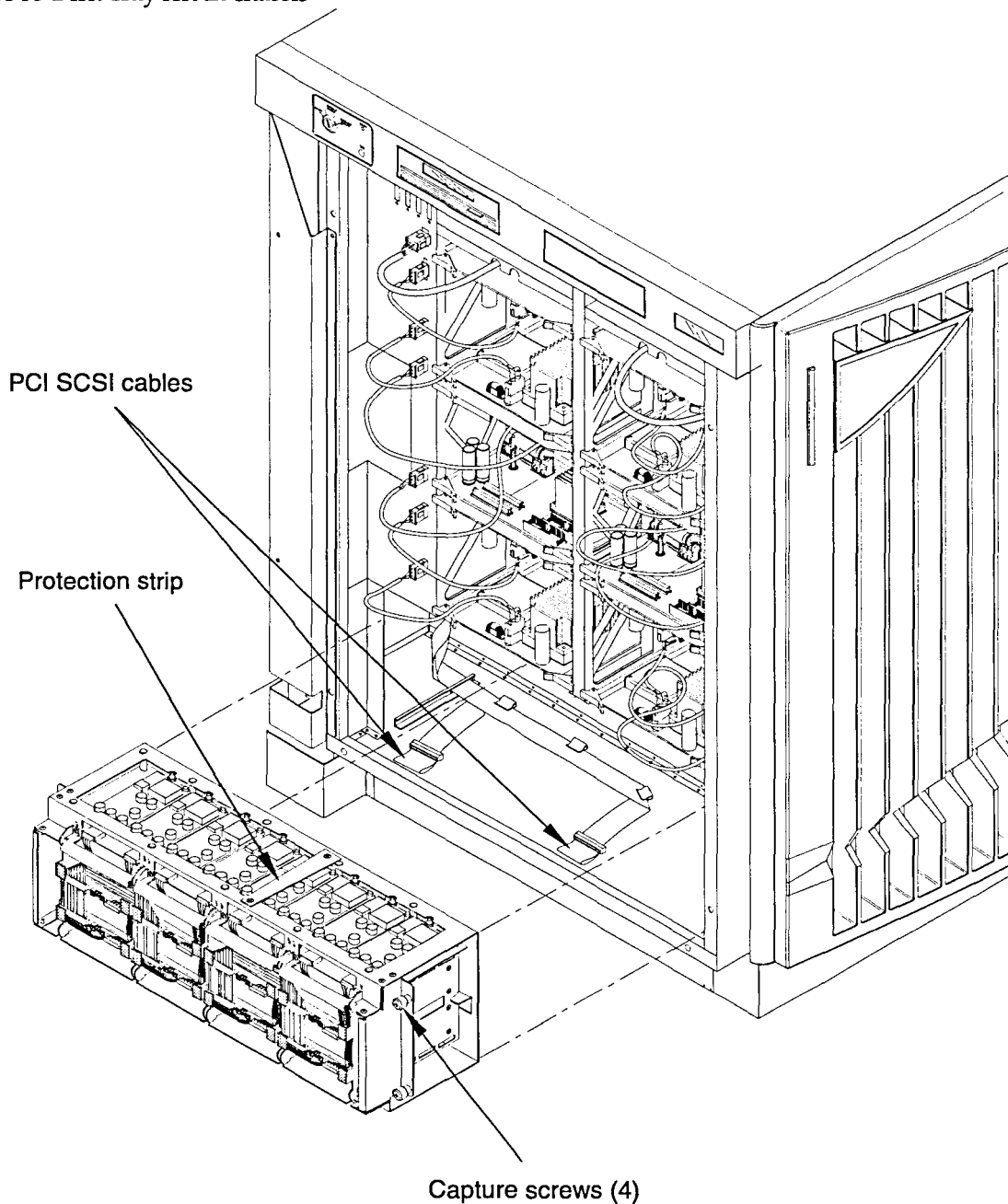


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- Step 5** Loosen the capture screws. Refer to Figure 33 on page 61 for help.
- Step 6** Remove the Disk Tray only enough to enable removal of the PCI SCSI cables from Disk Tray A and Disk Tray B. Use only the cable connector clips to remove the SCSI connectors to prevent damage to the cables. Refer to Figure 33 on page 61.

Step 7 Slide the Disk Tray out from the chassis using the power supply protection strip on the EDTPB as a guide. Refer to Figure 33 for the location of the protection strip.

Figure 33 Disk Tray left in chassis



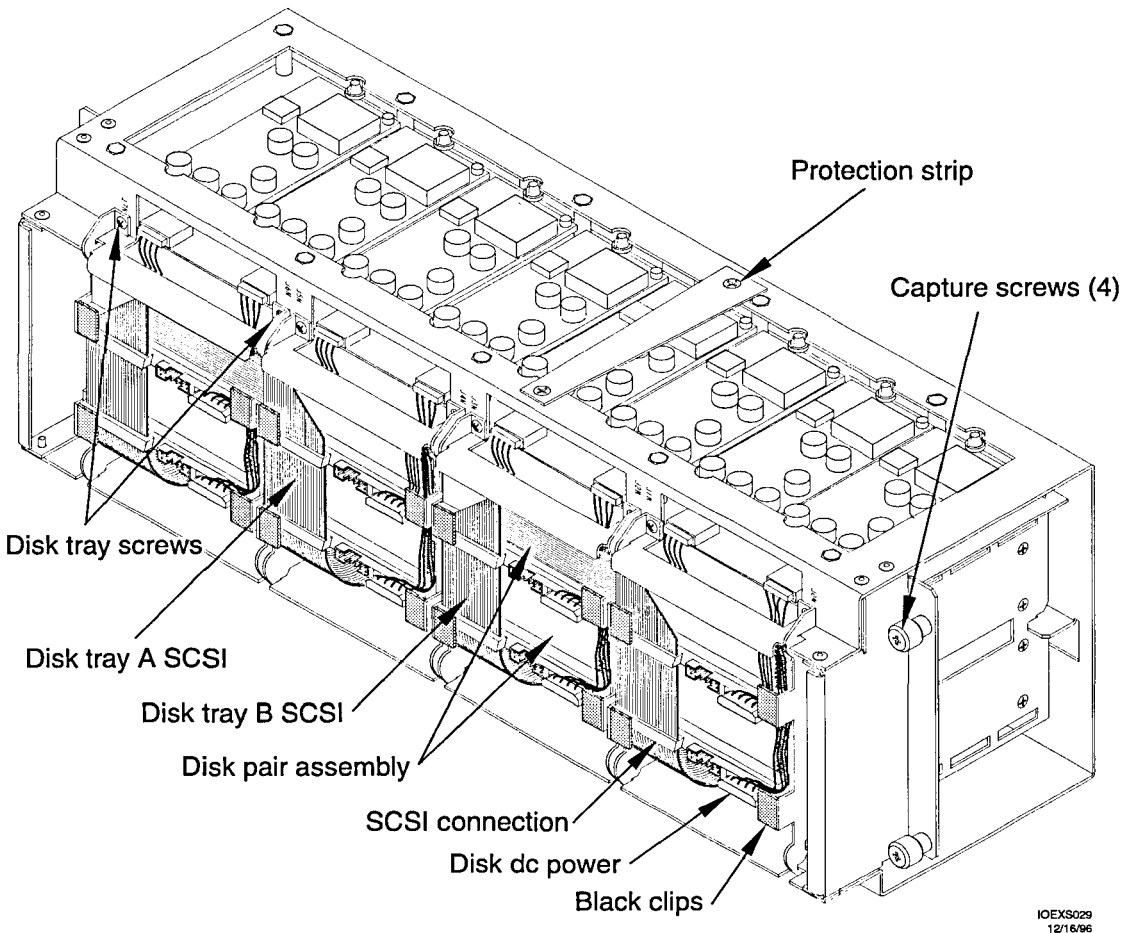
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Caution

Do not pull too hard on the chassis as it is pulled from the cabinet. Be sure not to lift up on the Disk Tray as it is pulled. The chassis should slide out of the cabinet along the protection strip provided on the EDTPB and system cabinet. If it does not move, check the SCSI cables on the bottom of the Disk Tray and other peripherals in the Disk Tray.

Step 8 Move the Disk Tray to a well-grounded work area to replace the drive. Refer to the "Grounded work area" section on page xv if an area has not been set up.

Figure 34 Disk Tray removed from chassis



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Disk Tray right removal

To remove the Disk Tray right follow the procedures below and refer to Figure 35 on page 64 as an aid.

Note

Removal of Disk Tray right is the same procedure as removal of Disk Tray left, except it is at the top of the chassis on the right side and is upside-down.

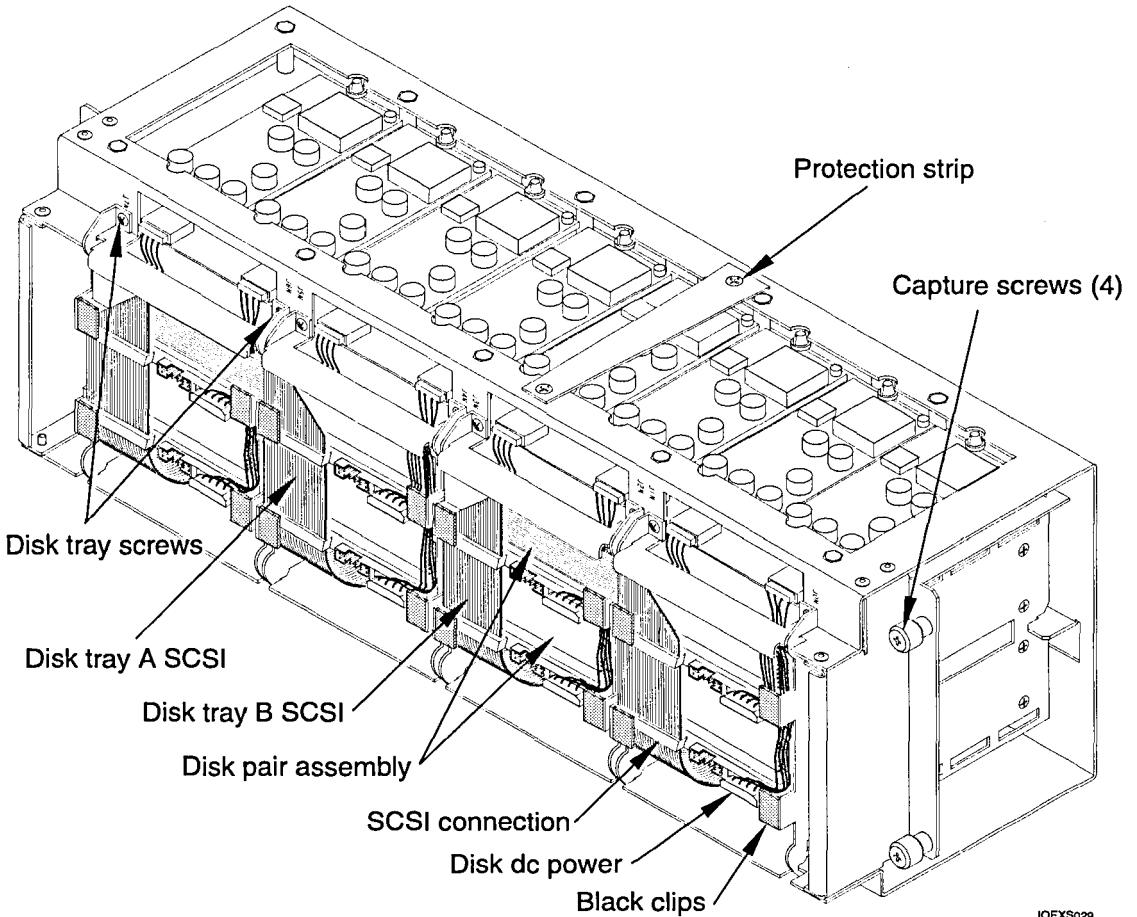
- Step 1** Remove the right side cabinet skin by pulling from the top and bottom of the skin until it pops out. The skin has a set of four catch pins that secure it to the chassis.
- Step 2** Remove the EMI panel by removing four screws on the sides of the panel.
- Step 3** Locate the Disk Tray on the top of the right side of the chassis.
- Step 4** Disconnect the dc power cable from the Exemplar Disk Tray Power Board (EDTPB) located on bottom of the Disk Tray. This should be on the right side of the EDTPB.
- Step 5** Loosen the capture screws.
- Step 6** Remove the Disk Tray only enough to remove the PCI SCSI cables from Disk Tray A (DTRA) and B (DTRB). Use only the cable connector clips to remove the SCSI connectors to prevent damage to the cables.

Note

Use extreme care to remove the Disk Tray. It is installed upside-down in this configuration and must be removed with extreme care so as to not damage the EDTPB as it slides along the power supply protection strip and the chassis.

Step 7 Slide the Disk Tray out from the chassis being careful of the SCSI cables on the drives and the EDTPB on the bottom of the chassis.

Figure 35 Disk Tray



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Step 8 Move the Disk Tray to a well-grounded work area and turn the Disk Tray over with the EDTPB on top, to add a drive. Refer to Figure 35 as a guide. See the "Grounded work area" section on page xv if an area has not been set up.

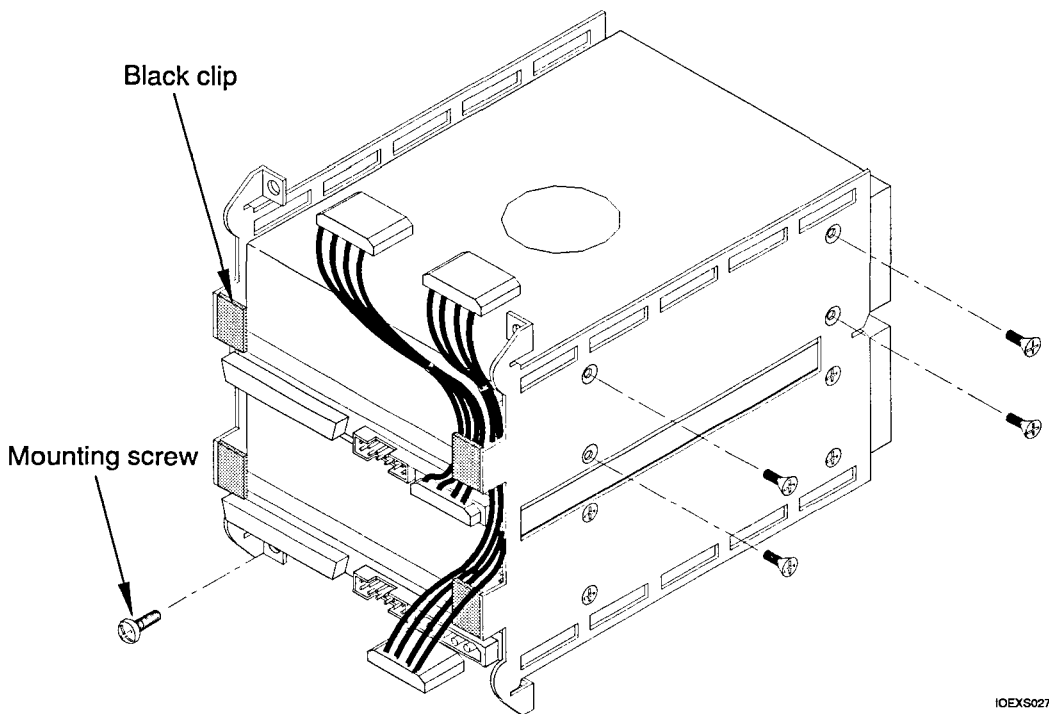
Disk pair assembly removal

With the Disk Tray on a grounded work area, perform the following steps to remove a disk pair assembly from the Disk Tray:

- Step 1** Disconnect the disk dc power cable between the EDTPB and the drive pair assembly you want to remove. Refer to Figure 36 on page 66 for the cable location.
- Step 2** Remove the Disk Tray SCSI cables from the disk pair assembly. Use only the cable connector clips to remove the SCSI connectors to prevent damage to the cables. Refer to Figure 35 on page 64.
- Step 3** Remove the two screws on the top and bottom of the disk pair assembly. Refer to Figure 36 on page 66.

- Step 4** Use the black clips as an aid to remove the disk pair assembly.
- Step 5** Loosen the brackets holding the disk pair assembly together by removal of eight screws of the defective drive and loosening eight screws of the other disk in the assembly. Refer to Figure 36.
- Step 6** Remove the defective drive.

Figure 36 Disk pair assembly removed from Disk Tray



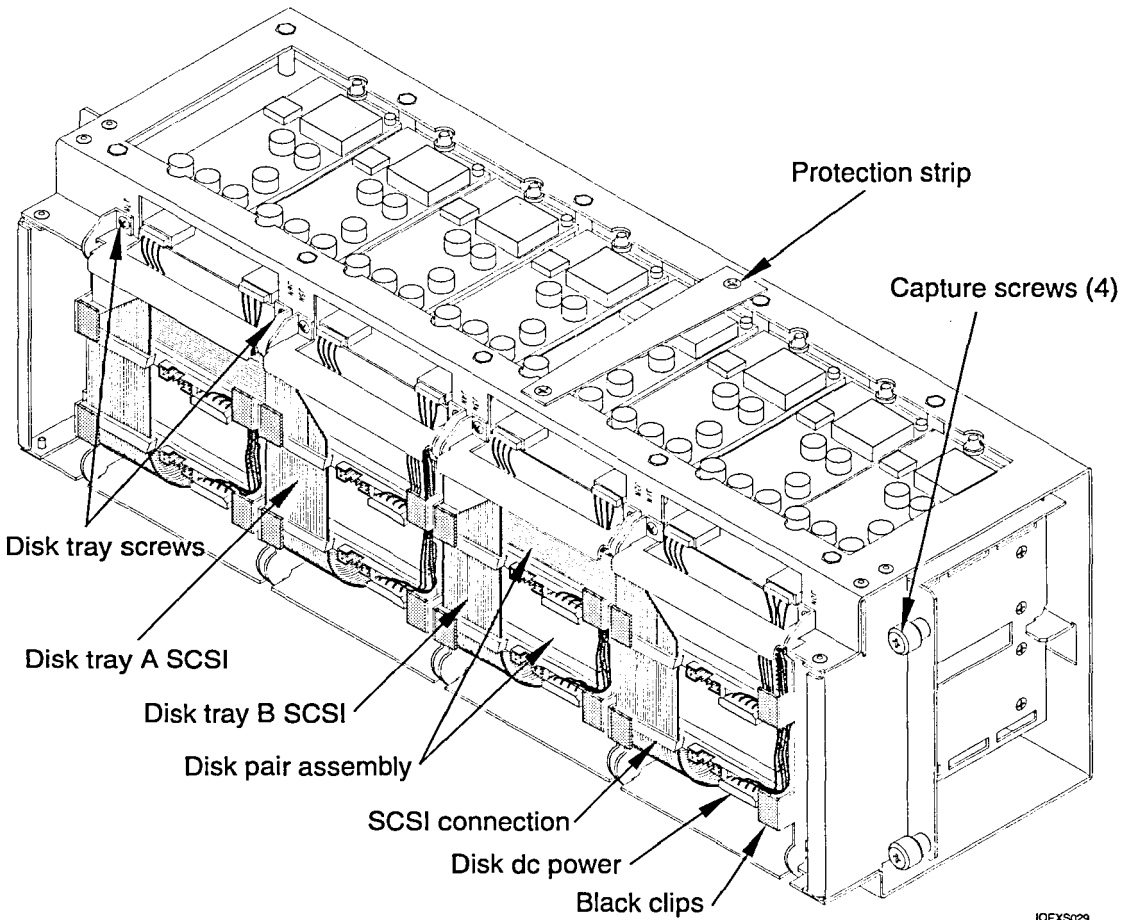
IOEXS027
12/12/96

Disk drive replacement

To replace the defective drive in the disk pair assembly:

- Step 1** Secure the replacement drive with eight screws and retighten the brackets by referring to Figure 36.
- Step 2** Install the disk pair assembly carefully in the Disk Tray by using the black clips as an aid.
- Step 3** Install two screws at the top and bottom of the tray. Refer to Figure 37 below as a guide.

Figure 37 Disk Tray left removed from chassis



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- Step 4** Set the SCSI ID of the drive replaced by checking either Figure 38 for Disk Tray left configurations or Figure 39 for Disk Tray right configurations.

Figure 38 Disk Tray left configuration of SCSI IDs

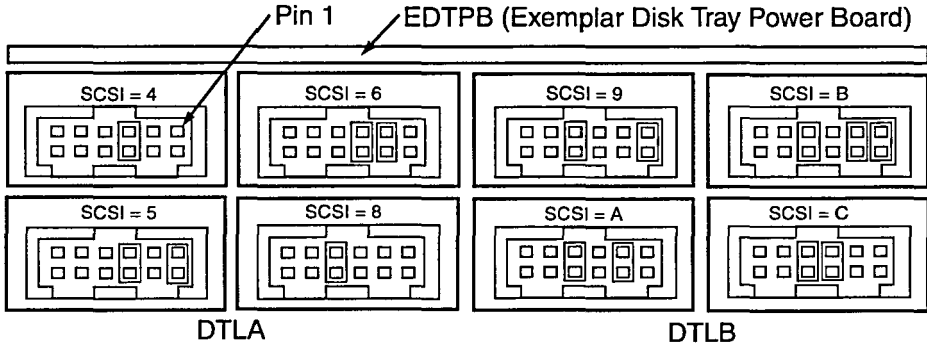
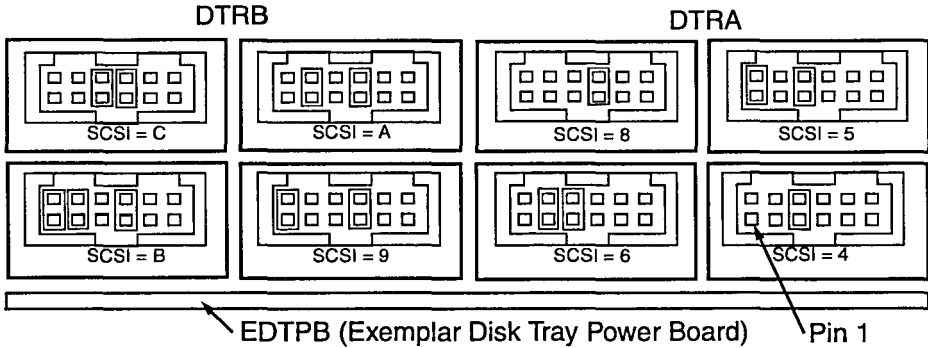


Figure 39 Disk Tray right configuration of SCSI IDs



In Figure 39 the viewer is looking at an upside-down view of the Disk Tray installed in the Disk Tray right configuration in the server.

- Step 5** Connect the disk dc power cables between the new drives and the EDTPB.
- Step 6** Connect the Disk Tray SCSI cables to the disk pair assemblies.

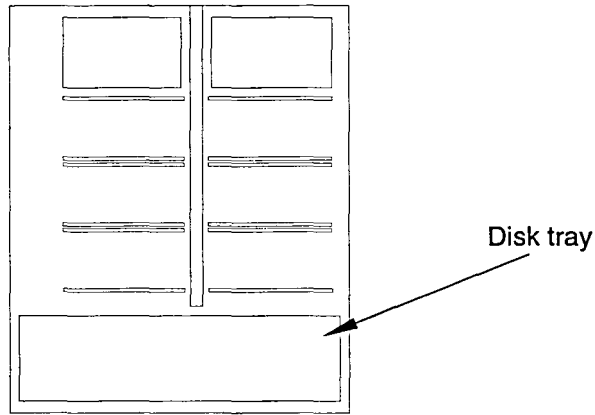
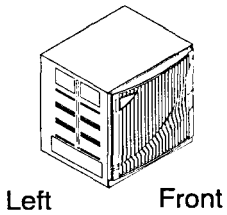
Disk Tray installation

Follow the procedure below to reinstall the Disk Tray to either the Disk Tray left or Disk Tray right configuration:

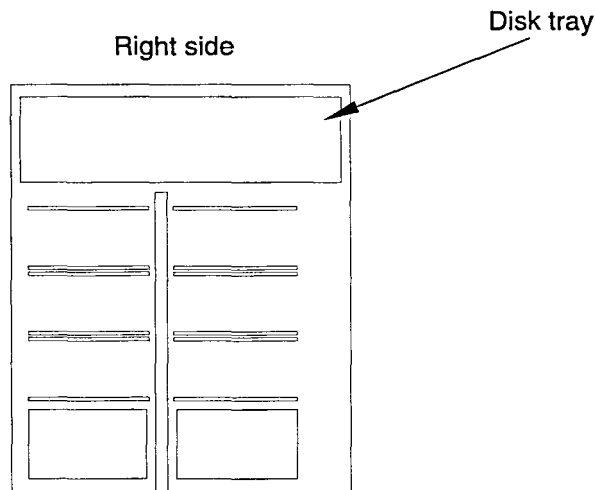
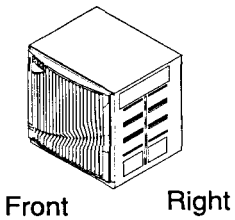
Step 1 Check the configuration diagram below and locate the Disk Tray.

Figure 40 Diagram of Disk Tray location

Left side



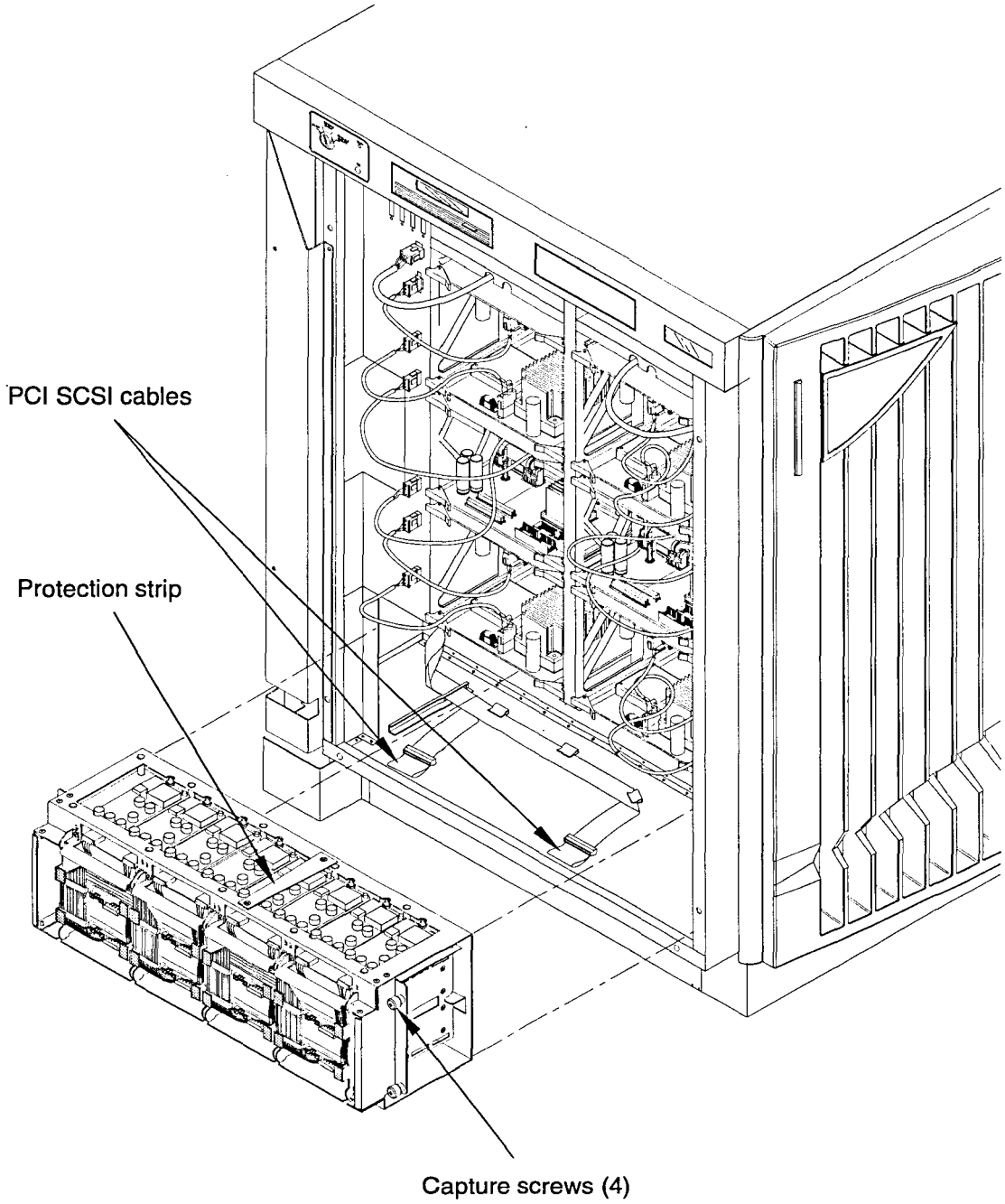
Right side



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Step 2 Install the Disk Tray by slowly sliding the assembly in the guides provided until the PCI SCSI cables can be attached to the Disk Tray A (DTLA) or (DTRA) and Disk Tray B (DTLB) or (DTRB). Use the cable clips to connect the SCSI cables. Refer to Figure 41 on page 70.

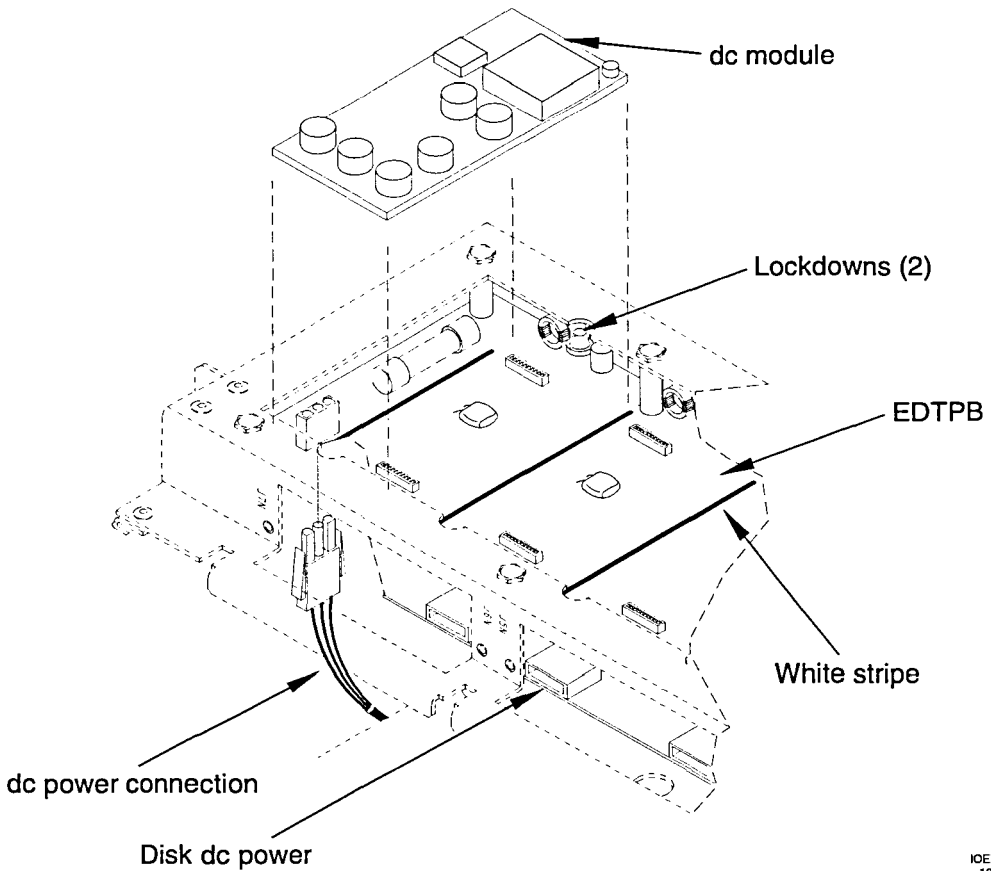
Figure 41 Disk Tray in chassis



IOEXS032
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Step 3 Attach the EDTPB dc power cable to the EDTPB. Refer to Figure 42 for an aid.

Figure 42 Detail of EDTPB showing dc connection

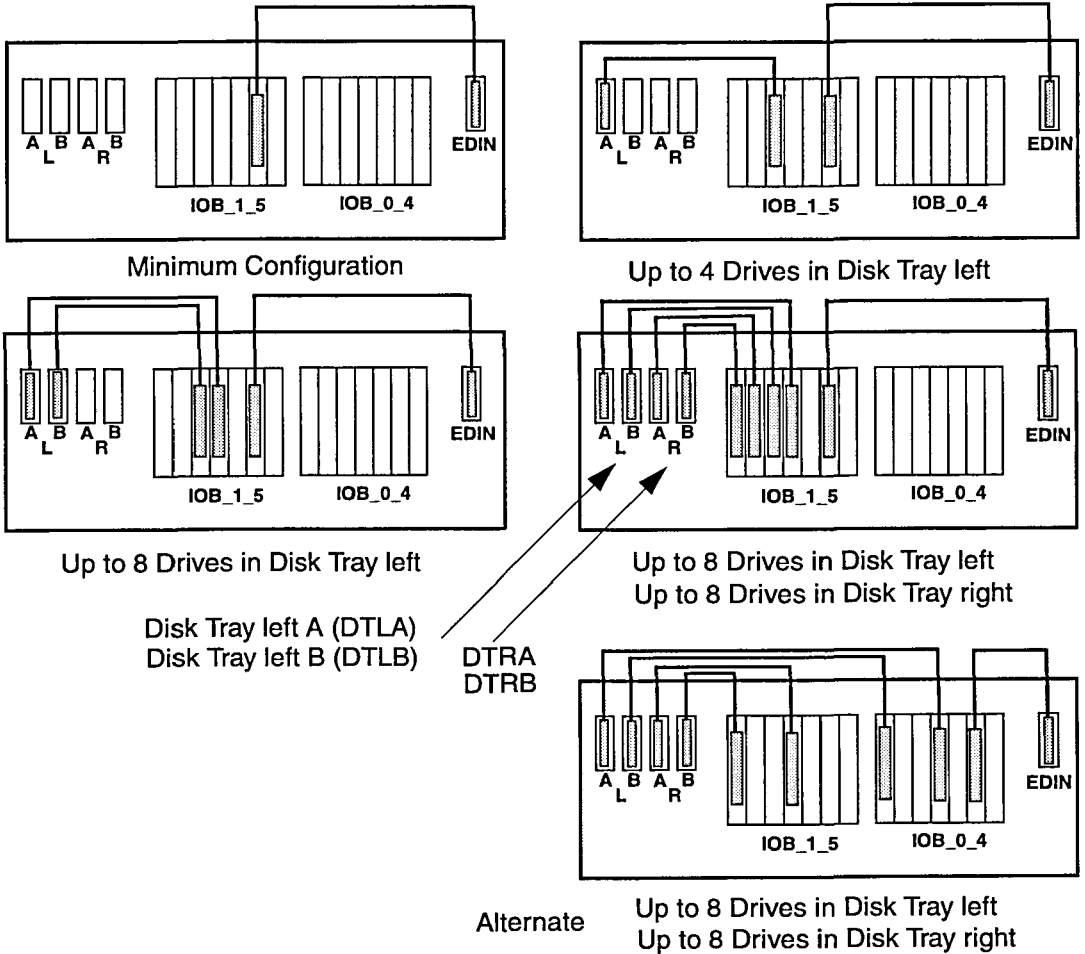


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Step 4 Install and tighten the capture screws.

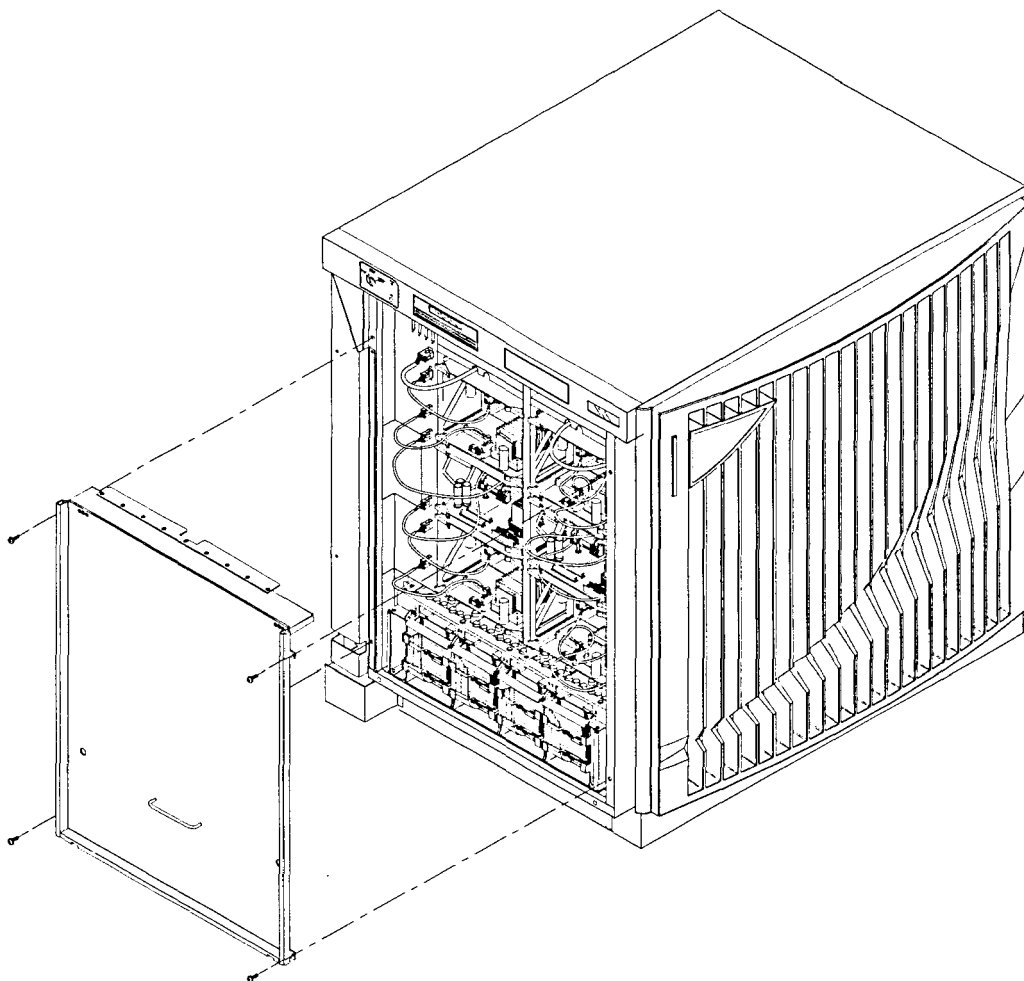
Step 5 Install additional SCSI cables between the bulkhead connectors, for the appropriate Disk Tray right (DTRA) (DTRB) and or Disk Tray left (DTLA) (DTLB), and the SCSI port on the PCI Card Cage per the recommended configuration shown in Figure 43.

Figure 43 Recommended configurations for SCSI ports



Step 6 Reinstall the EMI panels in their correct location. Refer to Figure 44 for help.

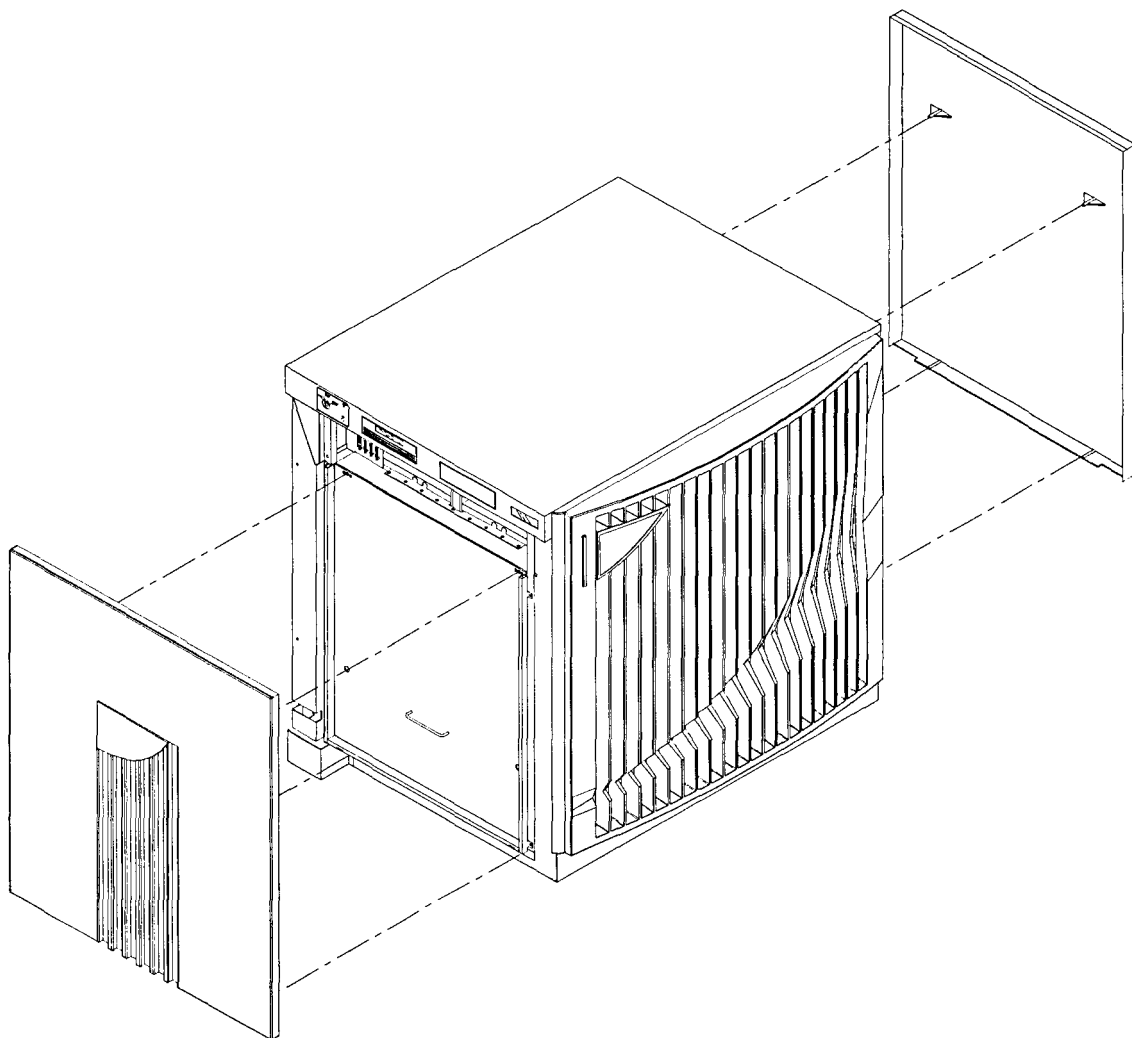
Figure 44 EMI panel installation



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12/5/96

- Step 7** Secure the left or right side cabinet skin by locating the catch pins in the holes in the chassis. Refer to Figure 45.

Figure 45 Side cabinet skin installation



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12/3/96

- Step 8** Integrate the drives into the server by referring to the “Software integration” section on page 41 of Chapter 3.
- Step 9** Check that the firmware revision on the replacement drive is at least the same or newer on the new drive as the one already installed in the chassis. If the new drive does contain an older firmware revision, it must be updated. See the “Checking the firmware” section on page 43 in Chapter 4.

dc module replacement

With the Disk Tray on a grounded work area, perform the following steps to replace a dc power module in the Disk Tray EDTPB.

Preparation

Observe the electrostatic discharge procedures described in the "Electrostatic discharge protection" section on page xv to prevent damage to the drive and Disk Tray during installation.

Note

One of the Disk Trays, Disk Tray Right, is upside-down. Turn it over to work on the EDTPB and dc power modules.

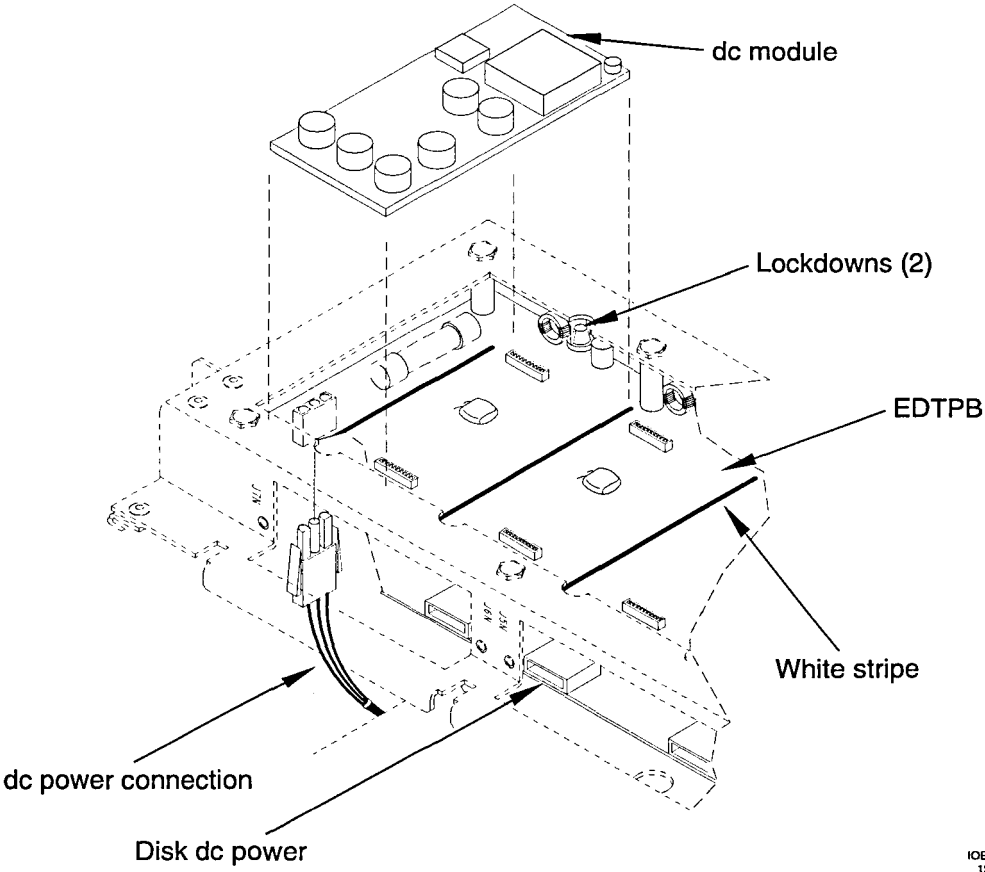
Replacement

- Step 1** Remove the power supply protection strip from the Disk Tray EDTPB to allow access to the dc modules. Refer to Figure 46 for its location.
- Step 2** Turn the lockdowns on the EDTPB of the dc module you want to remove. Refer to Figure 46 on page 76 for the location.
- Step 3** Carefully pull-up on the dc power module to remove.
Reverse the procedure to replace the power module.

Caution

Do not insert the dc module incorrectly, The white stripe should not be covered or overlapped.

Figure 46 Detail of EDTPB with dc modules



IOEXS030
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FRUs for the Disk Tray configuration

Table 9 contains the HP-CXD part numbers for the FRUs used when the Barracuda 9 is used in the Disk Tray configuration.

Table 9 FRUs for Disk Tray

HP-CXD part number	Description
525-000012-200	Disk Tray
550-001029-200	Disk Pair, 4GB w/ brackets
200-001059-200	converter dc-dc 5/12V 50w peak
603-040045-200	dc cables (EDTPB to disk)
301-000161-001	Connector, 68 Pos SCSI DIFF Terminator

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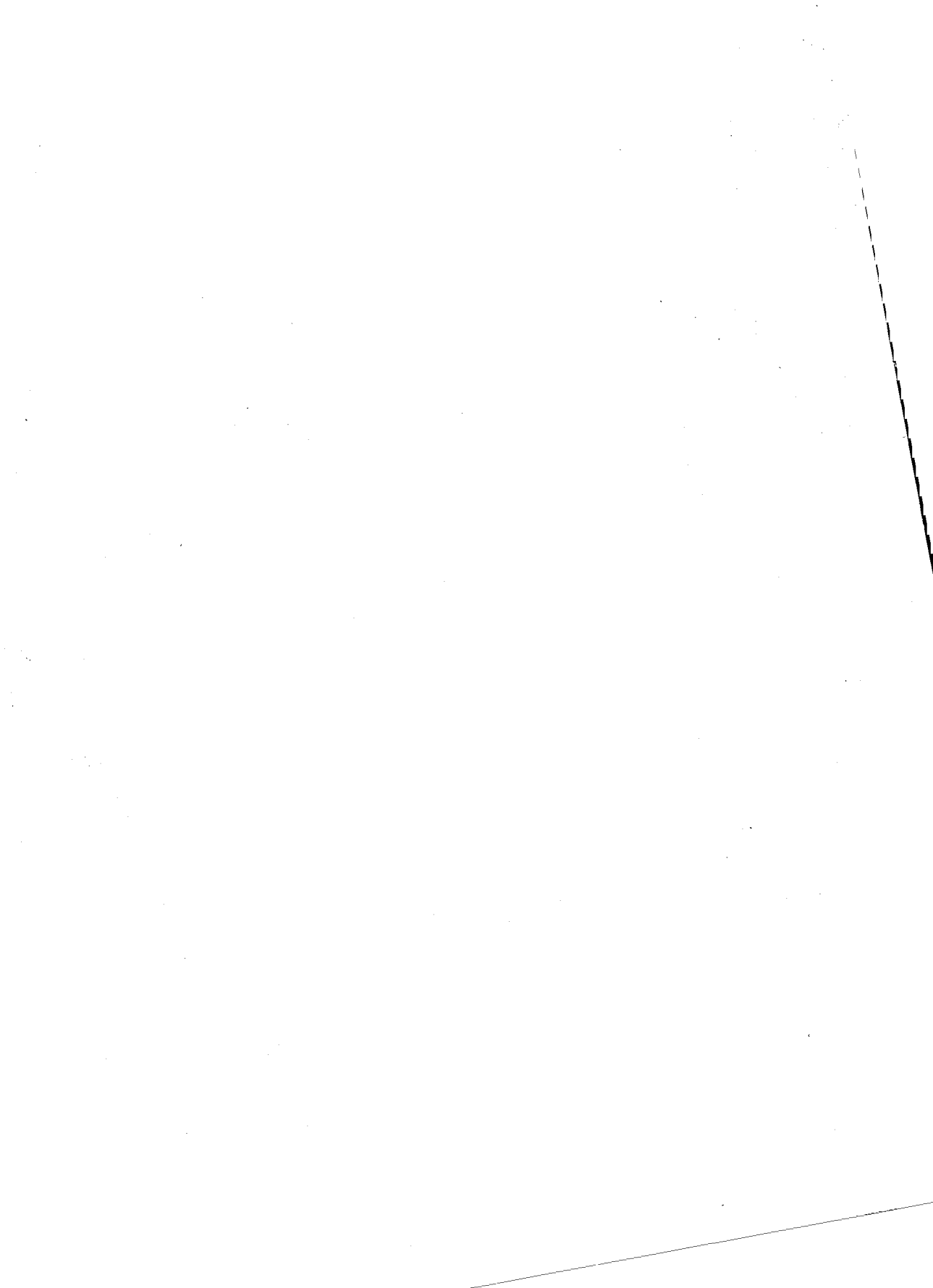
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