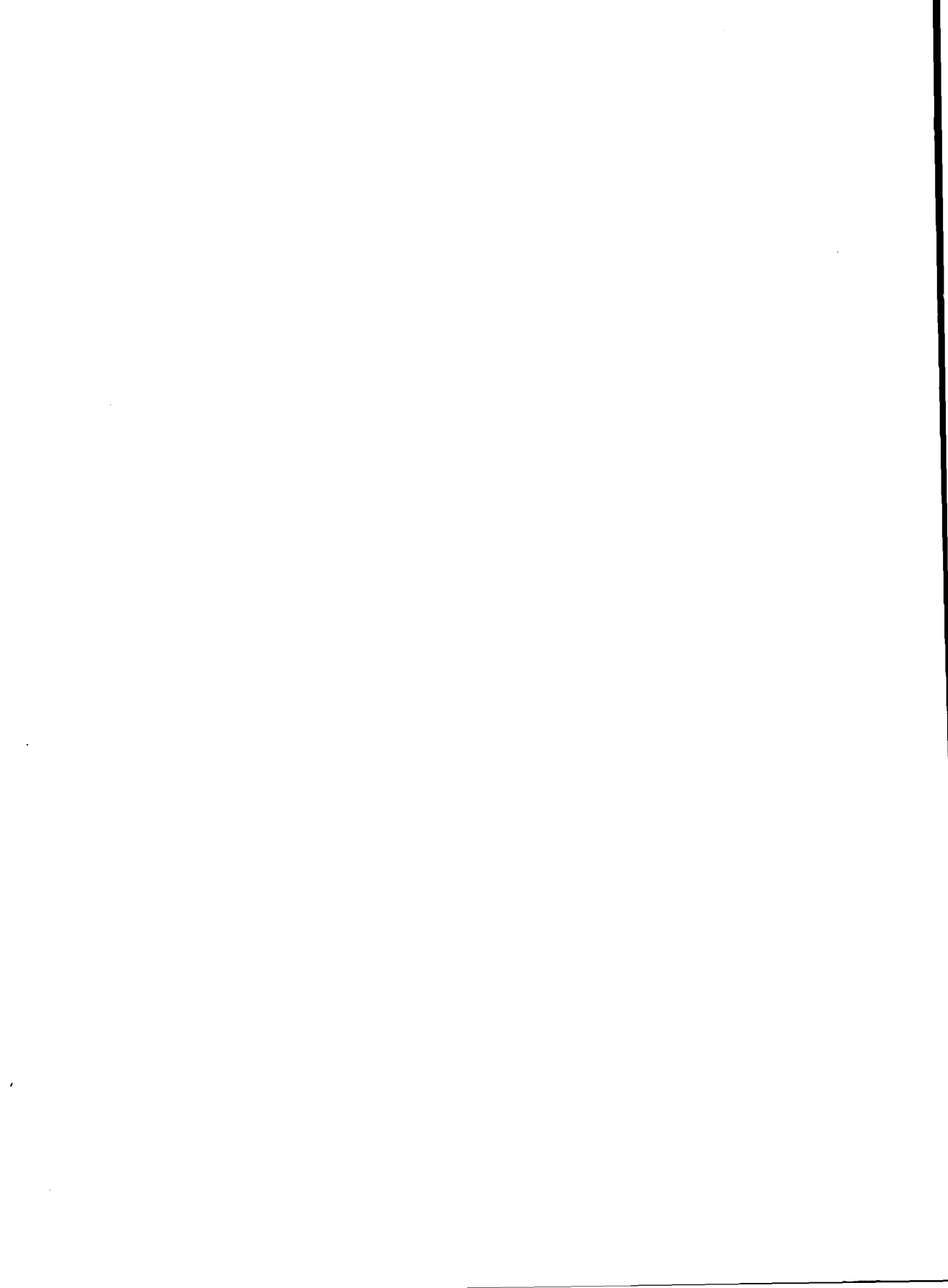


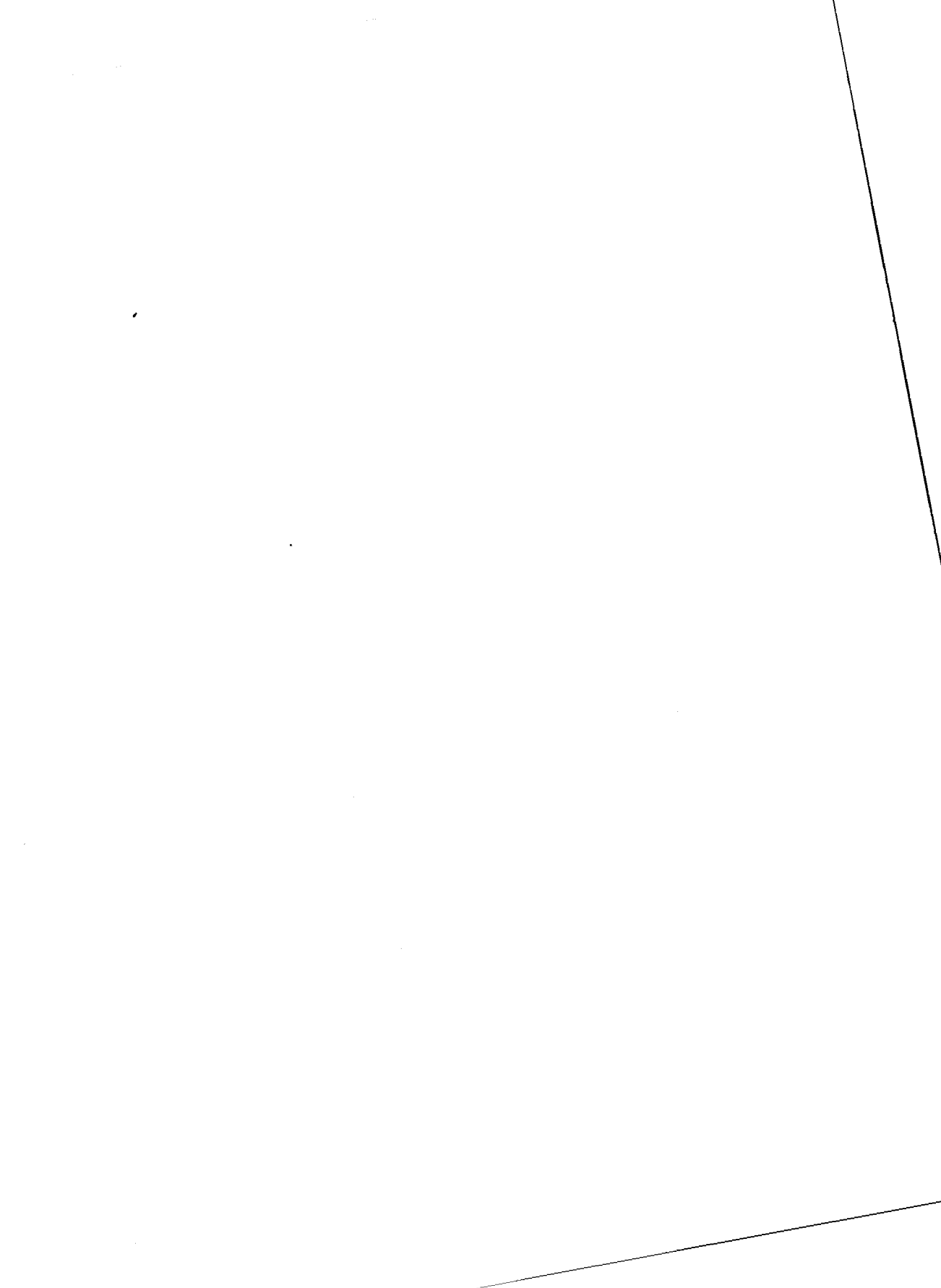
Exemplar  
S-Class and  
X-Class Servers

# Embedded Disk Installation and Service Guide

First Edition



**Hewlett-Packard Company**  
Convex Division  
3000 Waterview Parkway  
P.O. Box 833851  
Richardson, TX 75083-3851  
United States of America



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# Embedded Disk Installation and Service Guide

## Exemplar S-Class and X-Class Servers

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A4716-90009

First Edition

January 1997

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

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# **Embedded Disk Installation and Service Guide Exemplar S-Class and X-Class Servers**

A4716-90009

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# Contents

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<b>Preface</b> . . . . .	<b>xi</b>
Purpose and audience . . . . .	xi
Notational conventions . . . . .	xi
Notes and cautions . . . . .	xii
Associated documents . . . . .	xiii
Ordering documents . . . . .	xiii
Technical assistance . . . . .	xiii
Electrostatic discharge protection . . . . .	xiv
Grounded work area . . . . .	xiv
Antistatic packaging . . . . .	xv

---

<b>1 Barracuda 4 specifications</b> . . . . .	<b>1</b>
Disk description . . . . .	1
Drive specifications . . . . .	2
dc power requirements . . . . .	3
Drive jumpers . . . . .	4
Jumper block J01 . . . . .	5
Jumper block J4 . . . . .	6
Jumper block J5 . . . . .	7
Power supply specifications . . . . .	8

---

<b>2 Barracuda 4LP specifications</b> . . . . .	<b>11</b>
Disk description . . . . .	11
Drive specifications . . . . .	12
dc power requirements . . . . .	13
Drive jumpers . . . . .	14
Jumper block J2 . . . . .	14
Jumper block J1-Auxiliary . . . . .	16
Power supply specifications . . . . .	17

---

<b>3 Unpacking and inspection</b> . . . . .	<b>19</b>
Unpacking . . . . .	19
Visual inspection . . . . .	19
Bill of materials check . . . . .	19
Damage claims . . . . .	20

---

---

<b>4</b>	<b>Embedded installation</b>	<b>21</b>
	Overview of installation	21
	Preparation	22
	Installation	22
	EEDPB2 dc module installation	30
	Software integration	34

---

<b>5</b>	<b>Barracuda 4 firmware</b>	<b>37</b>
	Using scsiutil	37
	Checking the firmware	37
	Check the revision	39
	Downloading the firmware	39
	Reallocation	41
	Format the drive	41
	For ASA-2 type drives	41
	For ASA-1 type drives (0000)	41

---

<b>6</b>	<b>Barracuda 4LP firmware</b>	<b>43</b>
	Using scsiutil	43
	Checking the firmware	43
	Check the revision	45
	Downloading the firmware	45
	Reallocation	47
	Format the drive	47
	Reset mode sense values	47

---

<b>7</b>	<b>Embedded maintenance</b>	<b>49</b>
	Troubleshooting	49
	Preparation	49
	Checking the Embedded Disk connections	50
	After visual inspection	52
	Diagnostics	53
	Overview	53
	Running SCSI Interface diagnostics	55
	Sector errors	57
	Formatting the disk drive with scsiutil	57
	Removal and replacement	58
	Preparation	58
	Removal of the Embedded Disk drive	58
	Replacement of the Embedded Disk drive	63
	EEDPB2 dc module replacement	70
	SCSI cable replacement: PCI SCSI to EDIN	74
	FRUs for the Embedded Disk configuration	75

---

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# Figures

Figure 1	Rear view of Barracuda 4 disk drive	4
Figure 2	Barracuda 4: J4 jumper designations	6
Figure 3	Detail of EEDPB2 with dc modules	9
Figure 4	Rear view of the Barracuda 4LP disk drive	14
Figure 5	J2 jumper block designations	14
Figure 6	EEDPB2 showing dc module	18
Figure 7	Embedded Disk SCSI ID	22
Figure 8	Front cabinet skin, EMI panel, and filter	23
Figure 9	Embedded Disk location	24
Figure 10	Embedded Disk with brackets	25
Figure 11	Embedded Disk configuration	26
Figure 12	Embedded Disk EDIN to PCI connection	27
Figure 13	Front cabinet skin, EMI panel, and filter	28
Figure 14	Front cabinet skin, EMI panel, and filter	31
Figure 15	Detail of EEDPB2 with dc module	32
Figure 16	Diagram of Embedded Disk configuration	50
Figure 17	Embedded Disk configuration	51
Figure 18	Front cabinet skin, EMI panel, and filter	59
Figure 19	Embedded Disk configuration	60
Figure 20	Diagram of Embedded Disk configuration	61
Figure 21	Embedded Disk	62
Figure 22	Embedded Disk SCSI ID	63
Figure 23	Embedded Disk with brackets	63
Figure 24	Front cabinet skin, EMI panel, and filter	64
Figure 25	Embedded Disk with brackets	65
Figure 26	Embedded Disk configuration	66
Figure 27	Diagram of Embedded Disk configuration	67
Figure 28	PCI SCSI recommended configuration	68
Figure 29	Front cabinet skin, EMI panel, and filter	71
Figure 30	Embedded Disk configuration	72
Figure 31	Detail of EEDPB2 with dc module	73
Figure 32	EDIN to PCI SCSI cable replacement	74



---

# Tables

Table 1	Product information .....	1
Table 2	Drive specifications .....	2
Table 3	Barracuda 4 disk dc power requirements.....	3
Table 4	Jumper block J01 pin assignments.....	5
Table 5	Jumper block J4 pin assignments.....	6
Table 6	Jumper block J5 SCSI ID assignments.....	7
Table 7	Power supply characteristics .....	8
Table 8	Power supply voltage specifications.....	8
Table 9	Product information .....	11
Table 10	Drive specifications .....	12
Table 11	Barracuda 4LP disk dc power requirements .....	13
Table 12	J2 option select header jumper positions .....	15
Table 13	Jumper block J1-Auxiliary SCSI ID assignments..	16
Table 14	Power supply characteristics .....	17
Table 15	Power supply voltage specifications.....	17
Table 16	EPIC and PCI slot numbering .....	55
Table 17	FRUs for the Embedded Disk.....	75



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# Preface

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## Purpose and audience

The *Embedded Disk Installation and Service Guide: Exemplar S-Class and X-Class Servers* provides technical information on the Seagate Barracuda 4 disk drive and the Barracuda 4LP disk drive when configured as an Embedded Disk. This guide describes how to:

- Install the Embedded Disk disk drive
- Integrate the Embedded Disk 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.

### **monospace**

In command examples, text shown in **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 Technical Server.

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## Ordering documents

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

Hewlett-Packard Company  
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.

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## 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 Embedded Disk or its associated documentation.

---

## Electrostatic discharge protection

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. The Embedded Disk and related assemblies are sensitive to static electricity.

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 Embedded Disk 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 4 or Barracuda 4LP 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.

Discard and replace any bag that shows damage or wear.



---

# Barracuda 4 specifications

# 1

This chapter discusses the features and electromechanical and physical specifications of the Barracuda 4 disk drive when configured as a Hewlett-Packard Exemplar S-Class and X-Class Server Embedded Disk drive.

---

## Disk description

The Barracuda 4 disk drive (HP/CXD P/N 204-000035-200) is a high capacity, high performance member of the 3.5 inch Barracuda family. It is a Wide Differential drive with 20 Mbytes/sec data transfer rate.

It is used in an Embedded Disk drive configuration in the Exemplar S-Class and X-Class Server Family as a primary boot disk. See the table below for summary product information needed when contacting Hewlett-Packard for assistance.

**Table 1** Product information

<b>Product type</b>	<b>Barracuda 4 disk</b>
Hewlett-Packard model number	ST15150WD
Hewlett-Packard marketing number	DXD-1400
Hewlett-Packard part number	204-000035-200

## Drive specifications

Table 2 contains the basic specifications for the Barracuda 4 disk drive.

Table 2 Drive specifications

Characteristics	Conditions	Specifications
Size of Barracuda 4 disk drive (HP/CXD P/N 200-000035-200)	Width	4.0 in. (101.6 mm)
	Height	1.63in. (41.4 mm)
	Length	5.97 in. (151.6 mm)
	Weight	2.3 lb (1.04 kg)
Interface	NA	Wide Fast SCSI-2
Capacity (Mbytes)	Unformatted	5,062 Mbytes
Physical	Number of data heads	21
	Servo heads	1
	Disk diameter	3.7 in. (95 mm)
Transfer rate	Disk speed at 7200 RPM	0.5 - 20.0 Mbytes
Seek time (time required to move heads to a different track address)	Average	8.0 ms (read), 9.0 ms (write)
	Full seek	17 ms (read), 19 ms (write)
	One track	0.6 ms (read), 0.9ms (write)
Latency (time required to reach a particular track address after head positioning is complete)	Average	4.17 ms
	Maximum	NA
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 4 disk drive uses +5 Vdc and 12+ Vdc. Table 3 contains the dc power specifications for the Barracuda 4 disk drive.

**Table 3** Barracuda 4 disk dc power requirements

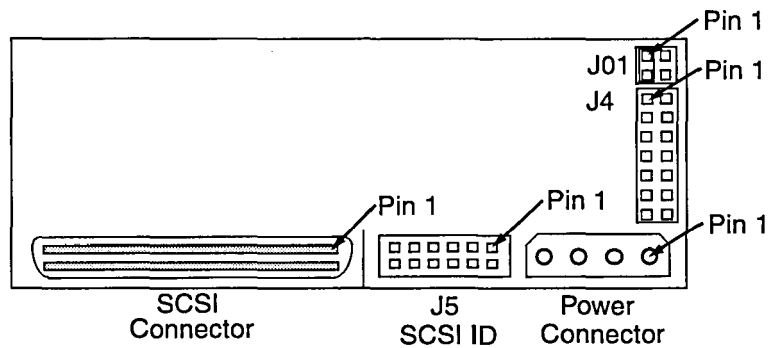
Power requirements	Supply voltage	
Current		
Maximum operating current	1.09 A	0.95 A
Average idle current	0.94 A	0.80 A
Maximum starting current	0.96 A	2.18 A
Maximum seek current	0.96 A	2.2 A
Voltage	+ 5 V	+ 12 V
Regulation	± 5%	± 5%

## Drive jumpers

Figure 1 illustrates the Barracuda 4 drive option select jumper connectors located on the rear of the disk drive. On the back of the drive are the following:

- Jumper block J01 configures terminator power.
- Jumper block J01 shows default jumper installed.
- Jumper block J4 configures:
  - parity checking
  - enable and delay motor start
  - write protect function
- Jumper block J5 (option connector) sets the SCSI ID.
- SCSI connector for drive cable
- Power connector for dc cable

**Figure 1** Rear view of Barracuda 4 disk drive







---

## Jumper block J01

Jumper block J01 is a 4-pin, 3-jumper position connector. Pins 1 and 3 of jumper block J01 make up the only jumper position that is already installed. Table 4 describes the jumper block J01 pin assignments. See Figure 1 for the location of jumper block J01.

Table 4 Jumper block J01 pin assignments

Pins	Description	Default configuration	Location
1 to 2	Terminator power supplied from drive. Jumper installed causes drive to supply terminator power to the internal terminators. Valid for only single-ended drives.	Not installed	
2 to 4	Terminator power supplied from the SCSI bus. Jumper installed causes SCSI bus to provide terminator power to the internal terminators. Valid for only single-ended drives.	Not installed	
1 to 3	Terminator power supplied to the SCSI bus. Jumpers installed causes drive to supply terminator power to the SCSI bus. (DIFF I/O CHASSIS)	Installed	
1 to 3 and 2 to 4	Drive provides terminator power to the SCSI bus and drive.	Not installed	

## Jumper block J4

Jumper block J4 is a 14-pin secondary jumper, 7-jumper position, gold header type connector. All jumpers are removed for the default setting. Refer to Figure 2 for jumper designations

Figure 2 Barracuda 4: J4 jumper designations

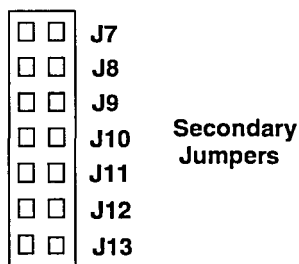


Table 5 describes jumper assignments.


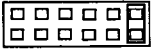

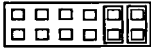
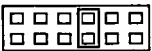
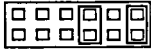
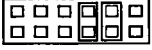



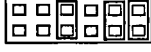




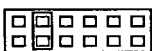
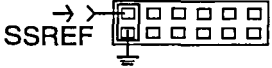
Table 5 Jumper block J4 pin assignments

Description	Jumper	Default setting
Reserved	J13	OUT
Enable Termination. Jumper is IN to enable termination. The default is disable termination. This jumper must be OUT for use in the Hewlett Packard Exemplar S-Class and X-Class Server. Valid for single-ended drives only	J12	OUT
Reserved	J11	OUT
Parity check. Jumper is IN to disable parity checking. The default is to enable parity checking.	J10	OUT
Motor Start. Jumper is IN causes to the drive to wait for the start unit command before starting the spindle motor. The default is based on the J8 setting.	J9	OUT
Delay Motor Start. Jumper is IN to make the drive start delay equal to the SCSI ID multiplied by 10 seconds. For example, for SCSI ID = 2 the drive delay would be for 20 seconds before starting. The default is no delay.	J8	OUT
Write Protect. Jumper is IN to disable writing. The default is no write protect.	J7	OUT

## Jumper block J5

Jumper block J5 is a 12-pin 6-jumper position connector. Jumpers 1 - 8 set the SCSI ID. Table 6 describes the jumper block J5 assignments. See Figure 1 on page 4 for the location of jumper block J5.

Table 6 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	
Remote LED Connector		Spindle Sync Cable Connector	

## 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 4 disk drive in the Exemplar S-Class and X-Class Server. This module mounts to the Exemplar Embedded Disk Power Board (EEDPB2) used in conjunction with an Embedded disk and DAT.

Table 7 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)

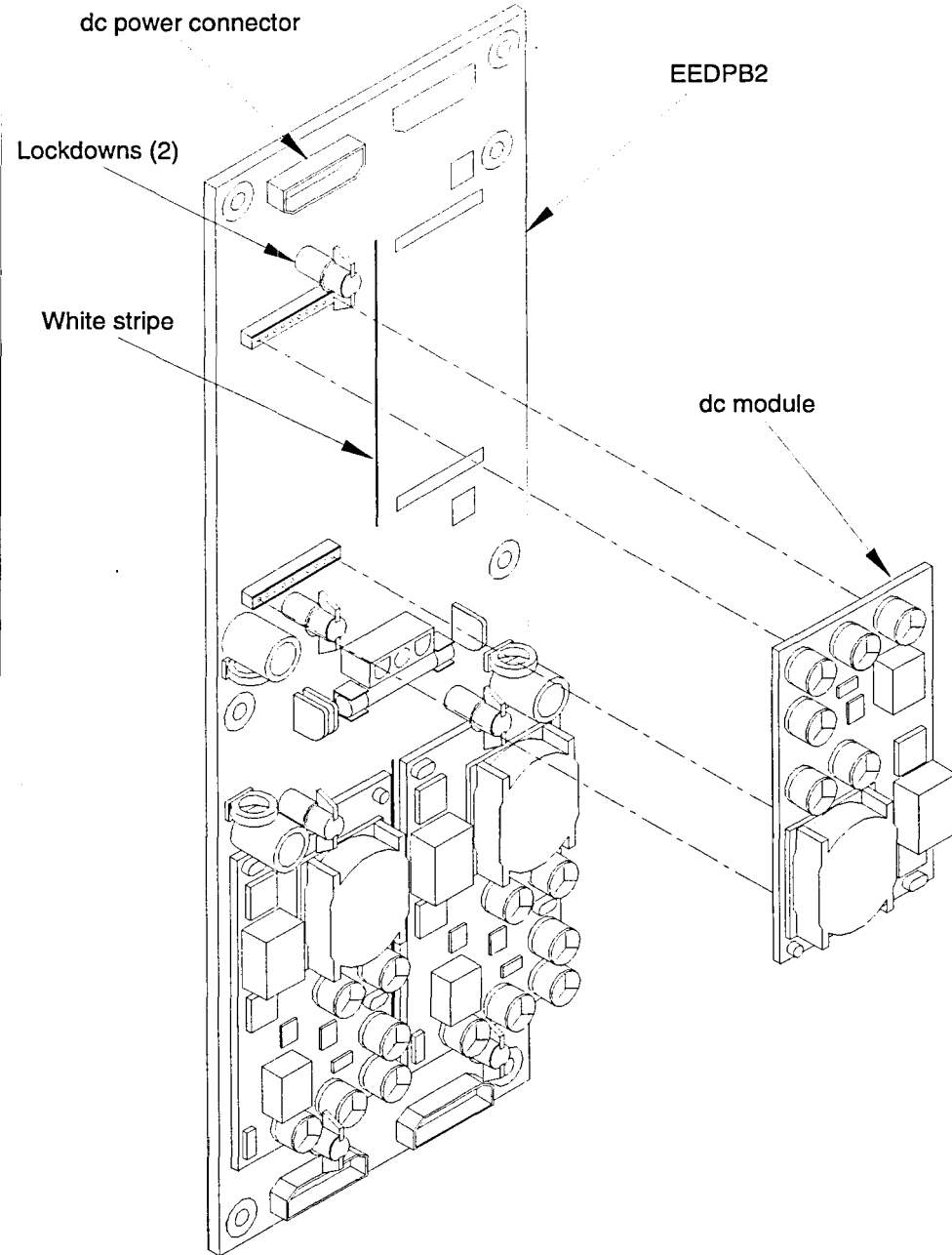
Table 8 contains the dc module voltage specifications

Table 8 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 3 shows the module as its mounted to the EEDPB2. It is located below the Embedded Disk in the front section of the server.

Figure 3 Detail of EEDPB2 with dc modules





---

# Barracuda 4LP specifications

# 2

This chapter discusses the features and the electromechanical and physical specifications of the Barracuda 4LP disk drive when configured as a Hewlett-Packard Exemplar S-Class and X-Class Server Embedded Disk drive.

---

## Disk description

The Barracuda 4LP disk drive (HP/CXD P/N 204-000049-200) is a high capacity, high performance member of the 3.5-inch Barracuda family. It is an Ultra-SCSI Differential drive, and, with multiple disks on a single SCSI bus, it can achieve 40 Mbytes/sec data transfer rate.

The Barracuda 4LP Disk drive is used as a primary boot disk (Embedded Disk) in the Exemplar S-Class and X-Class Server Family.

**Table 9** Product information

<b>Product type</b>	<b>Barracuda 4LP disk</b>
Hewlett-Packard model number	ST34371W
Hewlett-Packard part number	204-000049-200

## Drive specifications

Table 10 contains the basic specifications for the Barracuda 4LP disk drive.

Table 10 Drive specifications

Characteristics	Conditions	Specifications
Size of Barracuda 4LP disk drive (HP/CXD P/N 204-000049-200)	Width	4.00 in. (101.6 mm)
	Height	1.00 in. (25.4 mm)
	Depth	5.74 in. (145.8 mm)
	Weight	1.5 lb (0.68 kg)
Interface	NA	SCSI-3 Fast-20 (Ultra-SCSI)
Capacity(Mbytes)	Unformatted	4,320 Mbytes
Physical	Number of data heads	10
	Servo heads	1
	Disk diameter	3.5 in. (86 mm)
Transfer rate	Disk speed at 7200 RPM	1.25 - 40.0 Mbytes
Seek time (time required to move heads to a different track address)	Average	8.5 ms (read), 9.5 ms (write)
	Full seek	17.5 ms (read), 19.5 ms (write)
	One track	1.3 ms (read), 1.6 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	20 s
Stop time	Maximum	20 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 4LP disk drive uses +5 Vdc and 12+ Vdc. Table 11 contains the current and voltage requirements for the Barracuda 4LP disk drive.

**Table 11** Barracuda 4LP disk dc power requirements

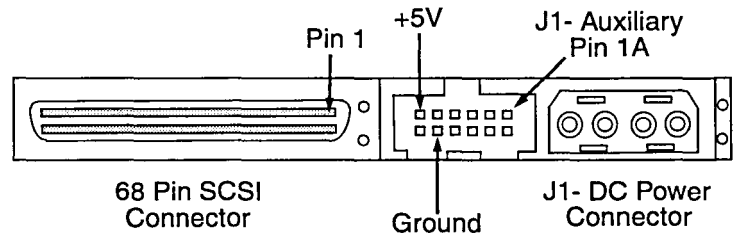
Power requirements	Supply voltage	
Current		
Maximum operating current	1.08 A	0.95 A
Average idle current	0.48 A	0.54 A
Maximum starting current	0.75 A	2.44 A
Maximum seek current	0.96 A	2.2 A
Voltage	+5 V	+12 V
Regulation	± 5%	± 5%

## Drive jumpers

Figure 4 illustrates the Barracuda 4LP Drive option select jumper connectors located on the rear of the disk drive. On the back of the drive is the following:

- Jumper Block J1-Auxiliary option connector (selects the SCSI ID)
- SCSI connector for drive cable
- Power connector for dc cable

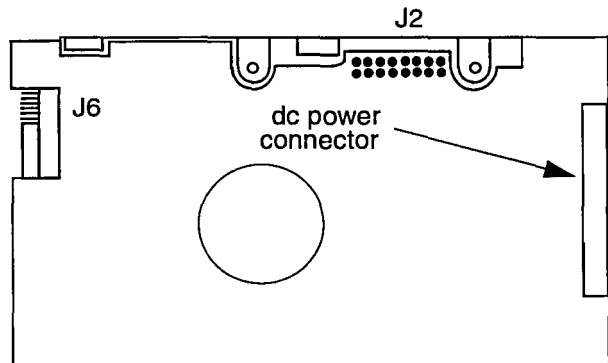
**Figure 4** Rear view of the Barracuda 4LP disk drive



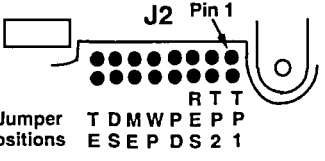
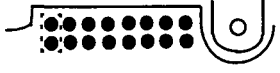
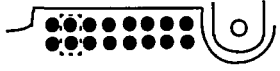


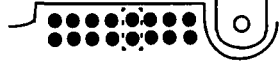
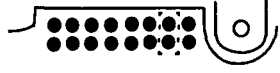
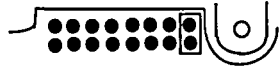
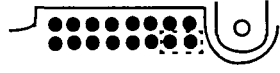
## Jumper block J2

Jumper block J2 is a 16-pin secondary jumper, 8-jumper position, connector. Default jumpers are shown installed in Table 12 on page 15. Figure 5 shows the J2 option select header location.

**Figure 5** J2 jumper block designations



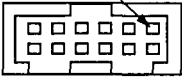
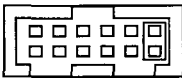
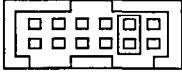
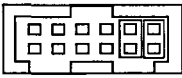
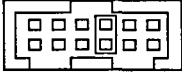
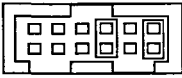
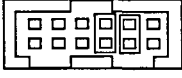
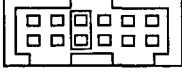


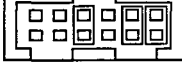
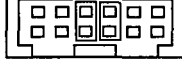
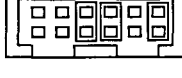

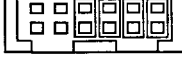
**Table 12 J2 option select header jumper positions**

Description		Default setting
Terminator Enable. Jumper installed connects the terminal termination to I/O lines. Valid for single-ended drives only.		OUT
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.		OUT
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.		OUT
Write Protect. Jumper installed protects the drive.		OUT
Parity Disable. Jumper out causes drive to check for parity.		OUT
Terminator Power from Drive. Jumper installed causes drive to supply terminator power to the SCSI bus.		OUT
Terminator Power to SCSI Bus.		IN
Terminator Power from SCSI Bus. Jumper installed causes SCSI bus to provide terminator power to internal terminators. For single-ended drives only.		OUT

## Jumper block J1-Auxiliary

Jumper block J1-Auxiliary is for option settings. This connector has 6-jumper placements, and the right 4 control the SCSI IDs.

Table 13 Jumper block J1-Auxiliary SCSI ID assignments

SCSI ID	Jumper Setting	SCSI ID	Jumper Setting
SCSI ID = 0	<p>Pin 1A</p> 	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	

## 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 4LP disk drive in the Hewlett-Packard Exemplar S-Class and X-Class Servers. This module mounts to the EEDPB2 (Exemplar Embedded Disk Power Board) used in conjunction with an Embedded Disk and DAT. See Table 14 and Table 15 for the dc module specifications.

Table 14 Power supply characteristics

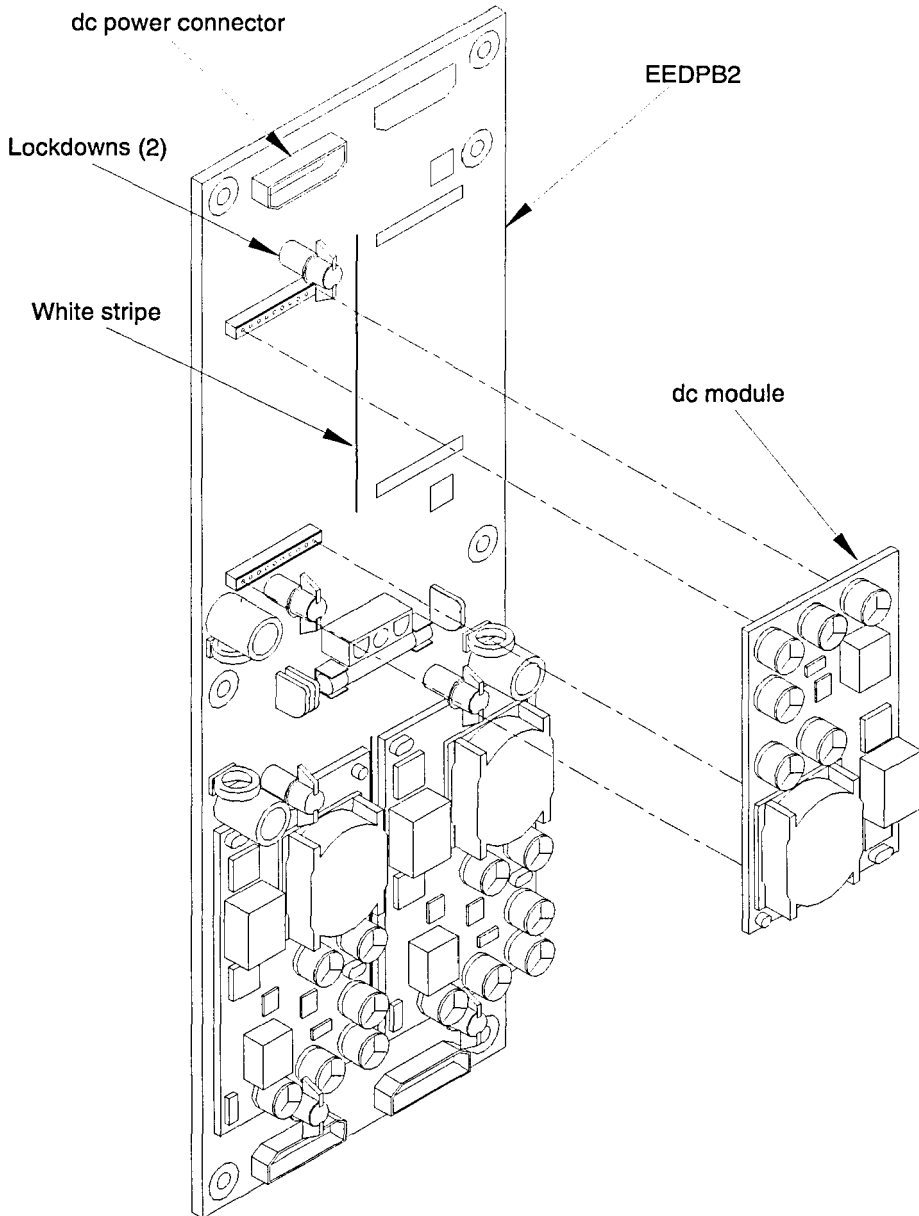
Parameter	Condition	Limits
Operating input voltage		36 Vdc to 72 Vdc
Maximum input current	Steady state	1.5 A maximum
	During spin-up surge	2.6 A maximum
	Start-up current	2.2 A maximum
Output voltage regulation	NA	± 0.3% typical
Output overvoltage shutdown	NA	5.40 V to 6.00 V maximum
	NA	12.75 V to 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		2.5 oz. (71g)

Table 15 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 %

Refer to Figure 6 for the location of the dc module used on the EEDPB2 (Exemplar Embedded Disk Power Board) as part of the Embedded Disk configuration.

Figure 6 EEDPB2 showing dc module



IOEX9047  
12/18/96

This chapter gives general guidelines for unpacking and inspecting the Embedded Drive prior to installation, as well as instructions on how to fill out damage claims.

---

## Unpacking

### Visual inspection

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.
- Step 4** 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, you 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 4 or the Barracuda 4LP as an Exemplar S-Class and X-Class Server Embedded Disk drive, the boot disk for the server.

---

## Overview of installation

Installation steps required to install an Embedded Disk involve removal of the front cabinet skin, EMI panel, and filter. 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** Remove the front cabinet skin from the chassis.
- Step 3** Remove the filter from the EMI panel.
- Step 4** Remove the front Electromagnetic Interface (EMI) panel of the chassis.
- Step 5** Set the SCSI ID for the Embedded Disk.
- Step 6** Install the Embedded Disk.
- Step 7** Attach the disk dc power cable between Embedded Disk and EEDPB2 (Exemplar Embedded Disk Power Board).
- Step 8** Attach the SCSI cable between the Embedded Disk and SE TO DIFF Converter board.
- Step 9** Install the PCI Card Cage SCSI.
- Step 10** Reboot system and perform a visual check
- Step 11** Check the firmware revision of the Embedded Disk.
- Step 12** Reinstall the EMI panel.

- Step 13 Reinstall the filter on the EMI panel.
- Step 14 Reinstall the front cabinet skin.
- Step 15 Integrate the Embedded Disk.

---

## Preparation

Preparation to install the Barracuda 4 or the Barracuda 4LP as an Embedded Disk involves the following.

---

## Caution

Do not connect a disk to the SCSI bus without first using the `/etc/shutdown` command to halt HP 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 chassis by turning the key switch located on the left panel by the DAT drive to the OFF position.

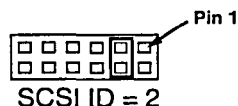
---

## Installation

Install the Embedded Disk after setting the SCSI address on the disk Jumper J5.

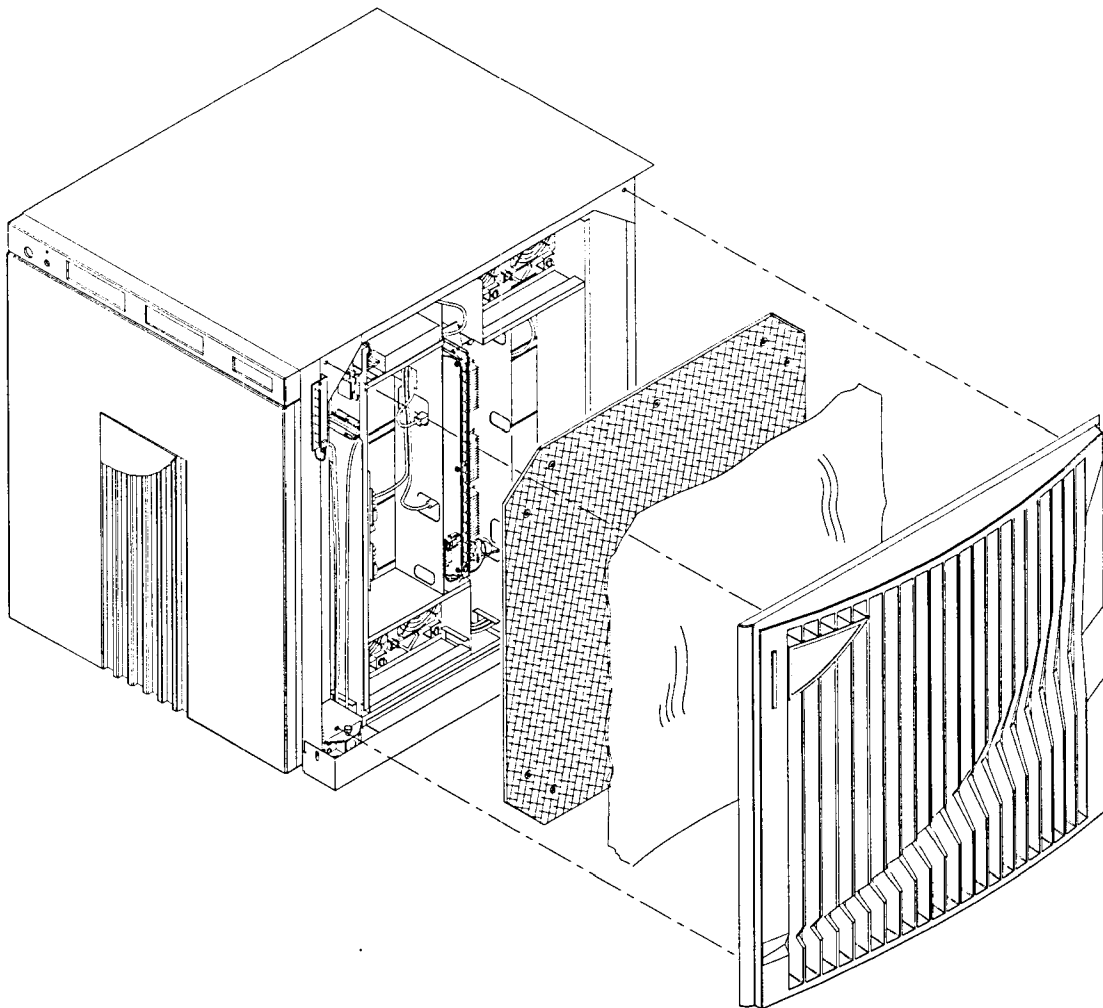
- Step 1 Set the SCSI ID [J5] to the ID as shown in Figure 7.

Figure 7 Embedded Disk SCSI ID



- Step 2** Remove the front 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 8.

**Figure 8** Front cabinet skin, EMI panel, and filter

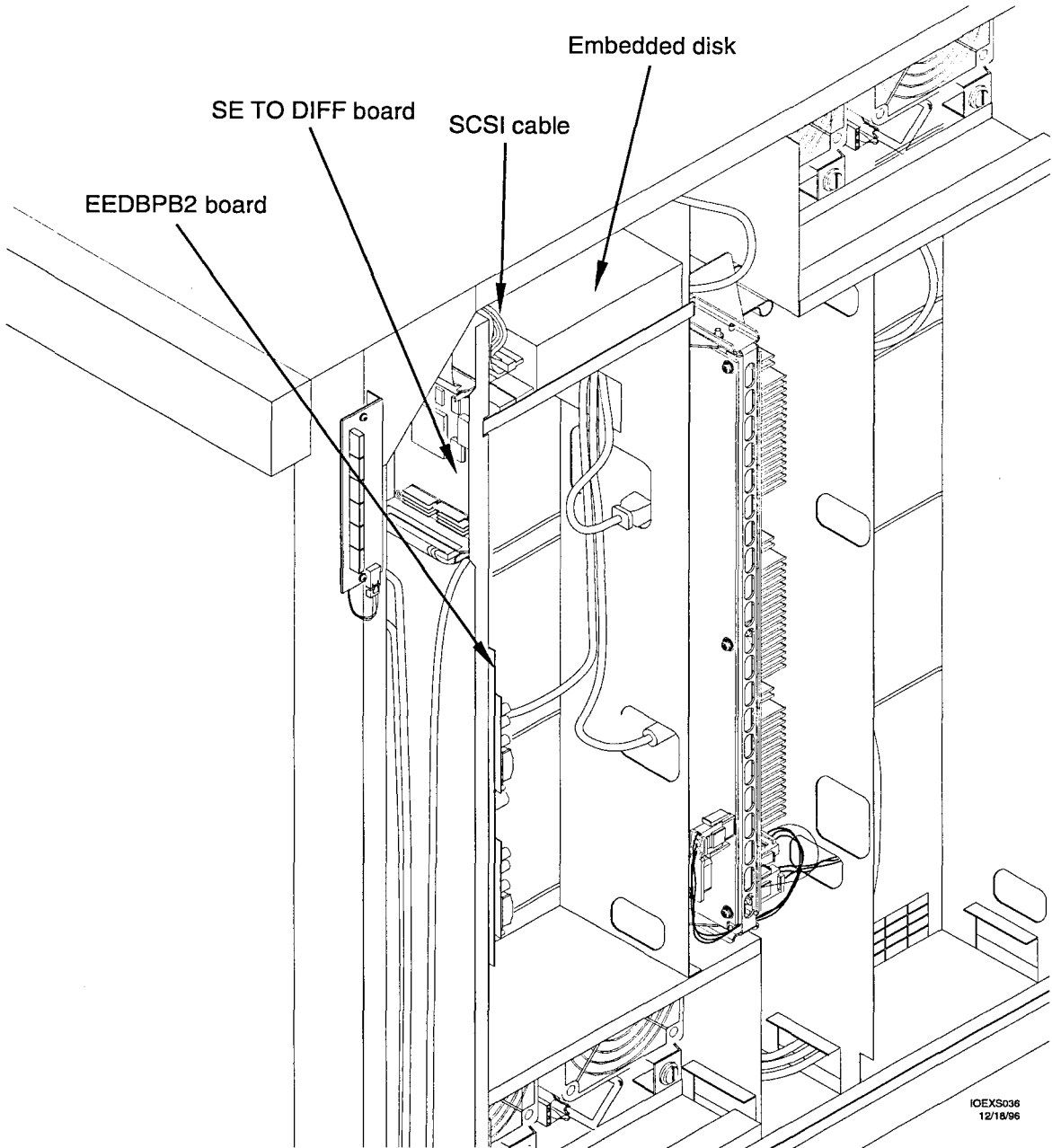


EXSM056  
12/17/96

- Step 3** Remove the filter by unfastening the velcro on the EMI panel.
- Step 4** Remove the front EMI panel by removing the screws on both sides of the panel as shown in Figure 8 above.

**Step 5** Locate the Embedded Disk drive in the upper left portion of the chassis. Refer to Figure 9.

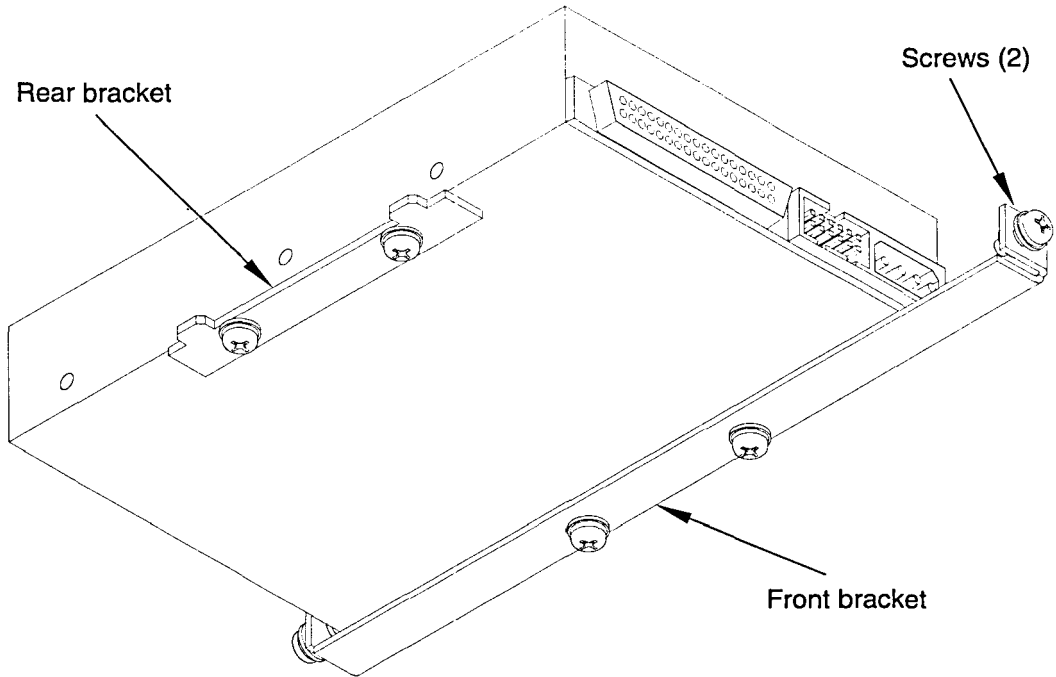
**Figure 9** Embedded Disk location



**Step 6** Face the front of the chassis and mate the two tabs of the Embedded Disk drive rear bracket with the two holes of the chassis wall. Refer to Figure 10.

**Step 7** Insure that the front bracket slides into the frame slots provided and secure with two screws as shown in Figure 10.

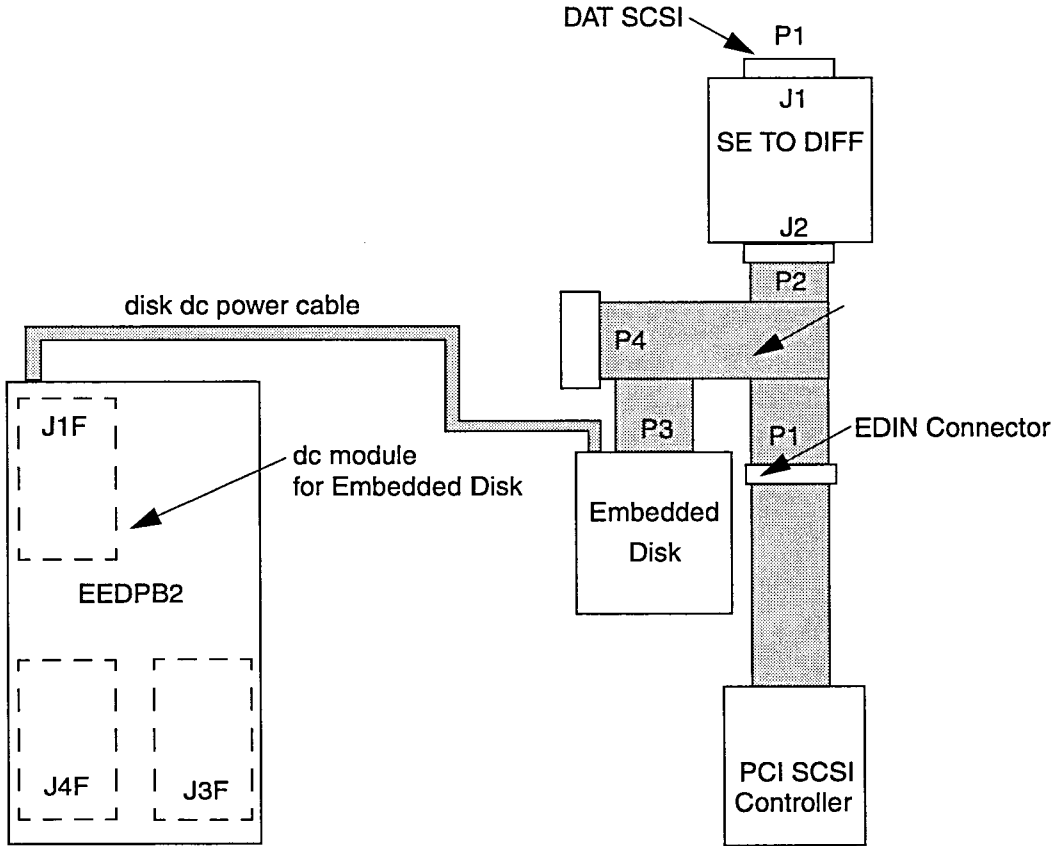
**Figure 10** Embedded Disk with brackets



IOEXS009  
12/19/96

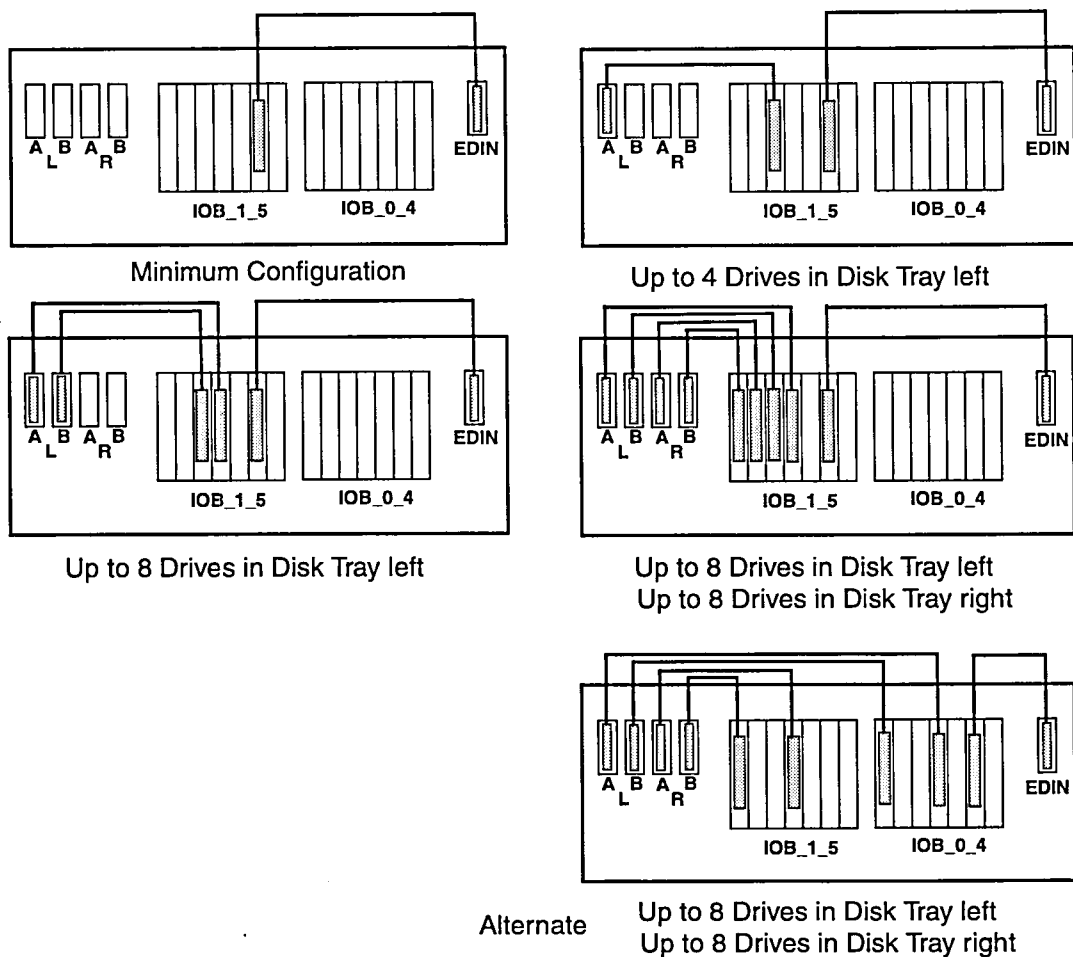
- Step 8** Attach the disc power cable between the EEDPB2 power board and the drive power connector on the rear of the drive. Figure 11 shows a diagram of the board and drive.
- Step 9** Attach the SCSI cable between the SCSI SE TO DIFF Converter board connector and the connector on the rear of the drive. Refer to Figure 11.

**Figure 11** Embedded Disk configuration



**Step 10** Install the SCSI cable between the PCI Card Cage and the EDIN connector on the left side of the server. Refer to Figure 12 and use either EDIN (Embedded Disk IN) location as shown.

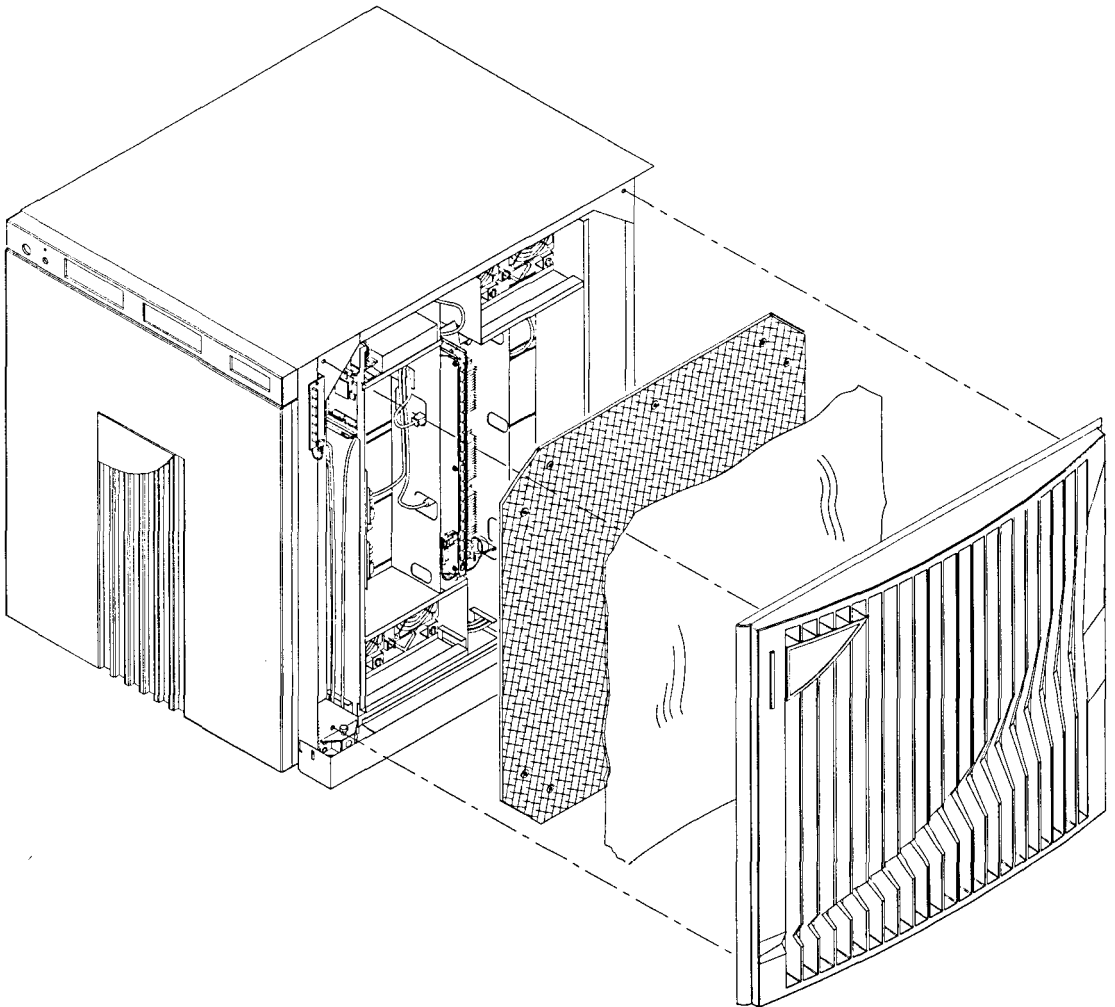
**Figure 12** Embedded Disk EDIN to PCI connection



**Step 11** Install the EMI panel on the chassis by referring to Figure 13 and installing the screws.

**Step 12** Install the filter on the EMI panel with the velcro fasteners provided.

**Figure 13** Front cabinet skin, EMI panel, and filter



EXSM056  
12/17/96

**Step 13** Secure the front cabinet skin by locating the catch pins in the holes in the chassis. Refer to Figure 13.

- Step 14** Integrate the new drive into the server by following the instructions in the “Software integration” section on page 34.
- Step 15** Check that the firmware revision on the drive is at least the same or newer on the replacement drive as the one already installed in the embedded configuration. If the replacement drive does contain an older firmware revision, it must be updated. See the “Checking the firmware” section on page 37 in chapter 5 for a Barracuda 4 configuration. See the “Checking the firmware” section on page 43 in chapter 6 for a Barracuda 4LP configuration.

---

## EEDPB2 dc module installation

To install a dc power module on the EEDPB2 (Exemplar Embedded Disk Power Board) follow these steps.

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

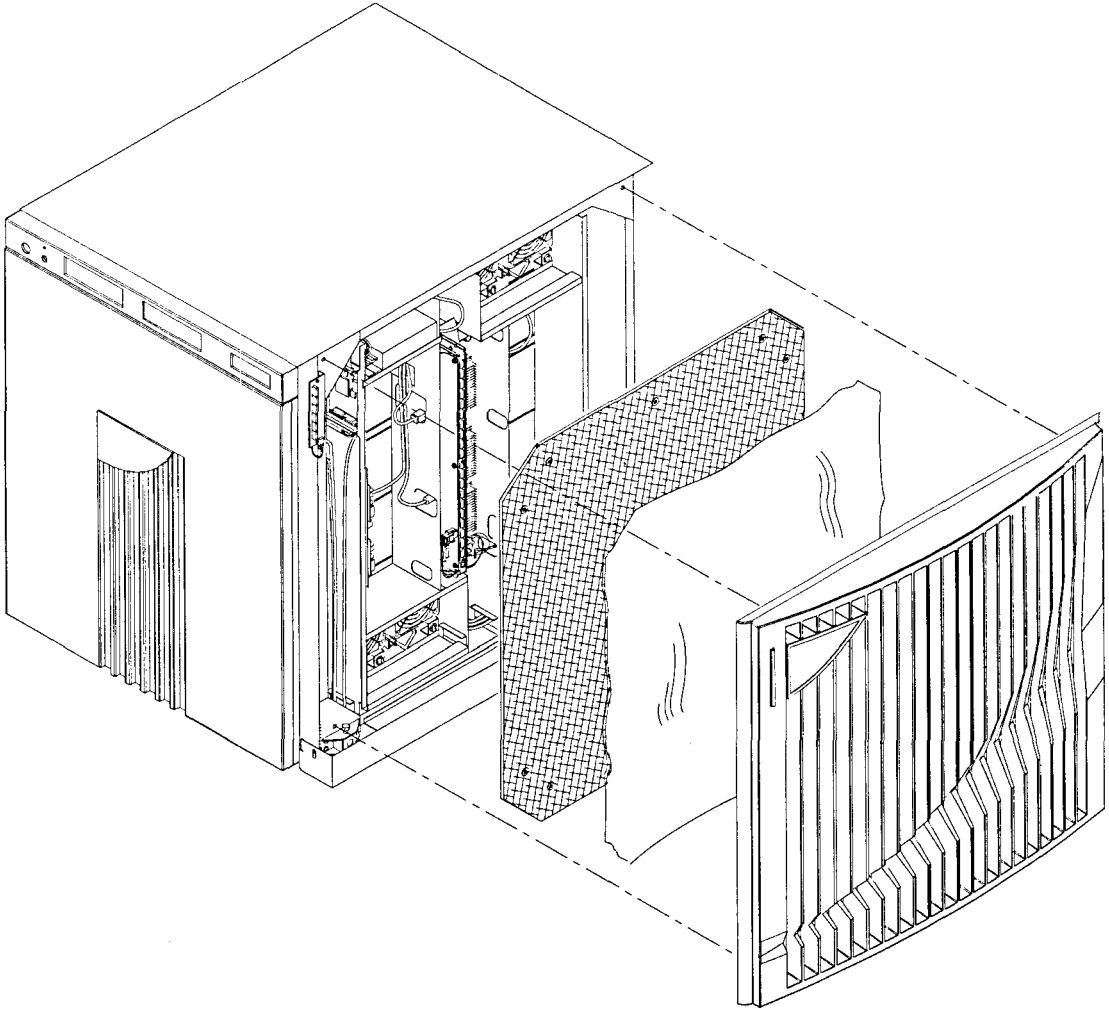
- Step 1** Shut down the system with the `etc/shutdown` command.
- ```
/etc/shutdown -h <time>
```

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** Remove the front 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 14.

**Figure 14** Front cabinet skin, EMI panel, and filter

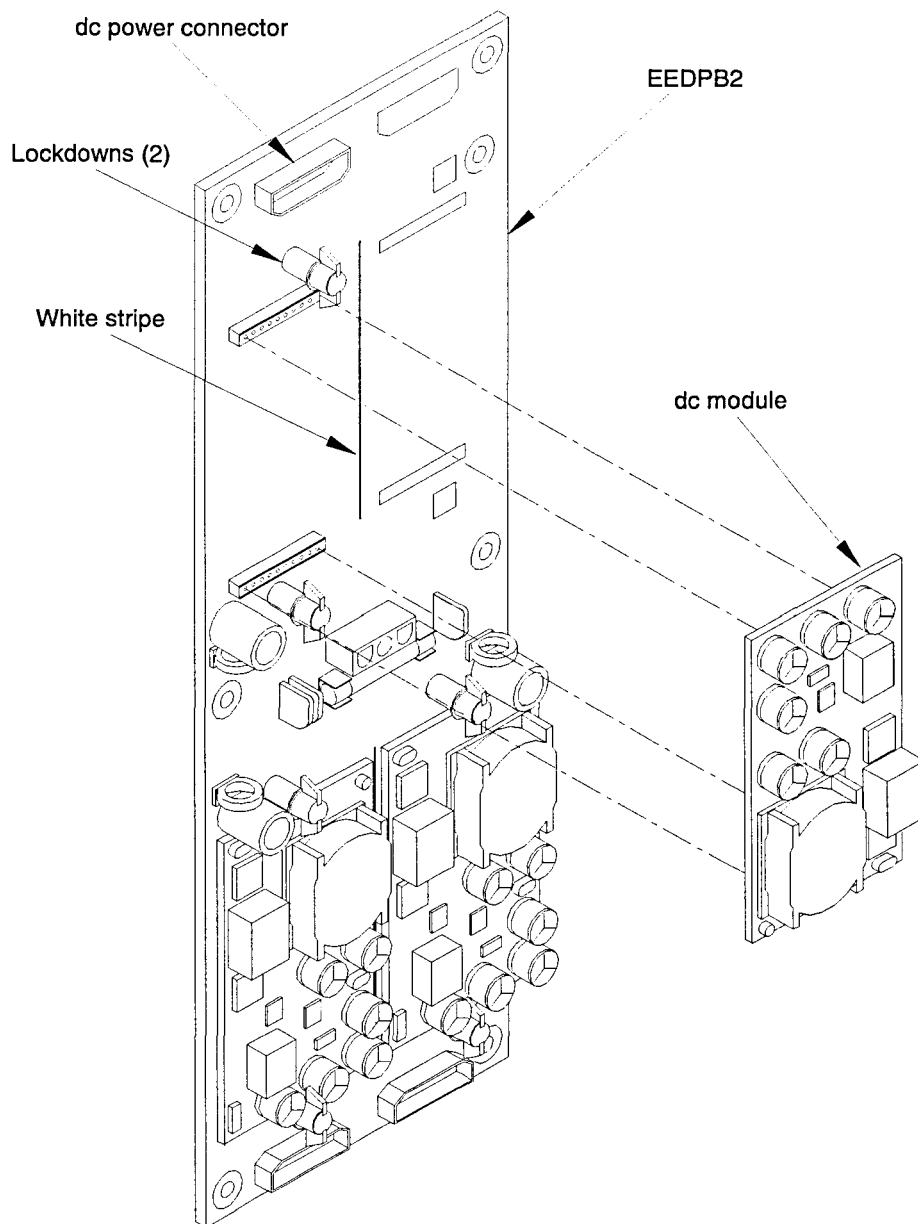


EXSM056  
12/17/96

- Step 4** Remove the filter by unfastening the velcro fasteners from the EMI panel.
- Step 5** Remove the front EMI panel by removing the screws on both sides of the panel as shown in Figure 14.

**Step 6** Locate the Embedded Disk drive in the upper left portion of the chassis. The EEDPB2 is mounted on the chassis side panel just below the drive. Refer to Figure 15.

**Figure 15** Detail of EEDPB2 with dc module



IOEXS047  
12/18/06

- Step 7** Install the dc power module in the upper portion of the EEDPB2 by using the illustration in Figure 15.
- Step 8** Mount the dc module flush with the edge of the EEDPB2. See Figure 15 and secure with the lockdowns as shown.

---

## Caution

---

Do not install this module in the wrong orientation. To avoid damage to the dc module it must be inserted in the power board as shown above, flush with the EEDPB2 edge and aligned with the white stripe.

## Software integration

This section contains a summary of procedures used to integrate a Barracuda 4LP as an Embedded Disk drive and descriptions of the system files that may require modification.

Use the following steps to integrate an Embedded Disk drive:

**Step 1** Boot SPP-UX to allow OBP to create a device path.

After booting, the drive will map to a specific logical device name (for example, `sd0`). 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
```

**Step 3** 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 4** Log in as root on the server.

**Step 5** Start `diskutil`. Enter

```
/usr/sbin/diskutil
```

**Step 6** 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 7** 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 8** 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 9** Configure partitions with the `diskutil partition` command.

**Step 10** After creating the SPP-UX file systems, mount the drives for user access using the `etc/mount` command.

**Step 11** View the `/etc/checklist` file to check the static information about the file systems.



This chapter describes how to verify and upgrade the Barracuda 4 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`, type `scsiutil` at the SPP-UX command prompt.

---

## Checking the firmware

Verify that the firmware is at the correct revision level and format type (ASA-1 or ASA-2):

**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 type ASA-2, Revision 22.

**Example:** Example of checking the firmware

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

```
Device node=0x0, path=0x0, target=0x6, lun=0x0 opened  
Vendor: SEAGATE,Product: ST15150WD,Revision:0022  
Capacity: 4294816768 bytes, (8388314 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 8f00013e 53454147 41544529 ".>SEAGATE"  
00000010 53543135 31353057 20202020 20202020 "ST15150WD"  
00000020 30303232 30303138 38313437 00000000 "002200188147...."  
00000030 00000000 00000000 00000000 00000000 "....."  
00000040 00000000 00000000 00000000 00000000 "....."  
00000050 00000000 00000000 00000000 00000000 "....."  
00000060 00436f70 79726967 68742028 63292031 ".Copyright (c) 1"  
00000070 39393520 53656167 61746520 416c6c20 "995 Seagate All"  
00000080 72696768 74732072 65736572 76656420 "rights reserved"  
00000090 41534132 00000000 00000000 00000000 "ASA2....."
```

**Note**

If the firmware type above is ASA1 then all dots will appear above instead of the ASA2.

---

## Check the revision

The revision and firmware type (0000 or ASA-2) should match the revision control document of HP-CXD TC (204-000035-350). The value 0000 is the Seagate designation representing ASA-1. If these match, then proceed to the "Reallocation" section on page 41; otherwise, go to the "Downloading the firmware" section on page 39.

---

## 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> = C4FW2022.LOD for firmware rev 22

**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: 0x8f
RelAdr: 0x0
WBus32: 0x0
WBus16: 0x1
Sync: 0x1
Linked: 0x1
CmdQue: 0x1
SftRe: 0x0
Vendor id: SEAGATE
Product id: ST15150WD
Product rev: 0022
```

**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
```

---

## For ASA-2 type drives

Perform 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 AC`
- Step 2** Clear mode data length  
`su 11> mdb 0x0 0`
- Step 3** Save the default values  
`su 12> script mode_select 11 AC`

---

## For ASA-1 type drives (0000)

Perform 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 A0`
- Step 2** Clear mode data length.  
`su 11> mdb 0x0 0`
- Step 3** Save the default values.  
`su 12> script mode_select 11 A0`



This chapter describes how to verify and upgrade the Barracuda 4LP drive firmware.

---

## Using `scsiutil`

Use `scsiutil` to verify or upgrade the firmware. The `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`, type `scsiutil` at the SPP-UX command prompt.

---

## Checking the firmware

Verify that the firmware is at the correct revision level by performing the following steps:

**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 0280.

**Example:**

```
su 1> op 0:0:2:0<cr>
```

```
Device 0:0:2:0 opened
```

```
Vendor: SEAGATE,Product: ST34371W,Revision:0280
```

Revision level

```
Capacity: 4350443008 bytes, (8496959 blocks, 512 bytes per block)
```

```
su 2> ddb 0 160<cr>
```

```
node=0x0, path=0x2, target=0x6, lun=0x0:
```

```
00000000 00000202 8f00013e 53454147 41544529 ".....>SEAGATE"  
00000010 53543135 31353057 20202020 20202020 "ST1510WD" Revision level  
00000020 30303232 30303138 38313437 00000000 "028000188147...."  
00000030 00000000 00000000 00000000 00000000 "....."  
00000040 00000000 00000000 00000000 00000000 "....."  
00000050 00000000 00000000 00000000 00000000 "....."  
00000060 00436f70 79726967 68742028 63292031 ".Copyright (c) 1"  
00000070 39393520 53656167 61746520 416c6c20 "995 Seagate All"  
00000080 72696768 74732072 65736572 76656420 "rights reserved"  
00000090 41534132 00000000 00000000 00000000 '.....'
```

---

## Check the revision

The revision should match the revision control document of HP-CXD TC (204-000049-350). 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>* = 83450280.LOD for firmware rev 280

**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.

**Note** 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

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: ST34371W  
Product rev: 0280

**Revision  
level**



---

## Reallocation

Perform the following commands to set auto\_allocation:

- Step 1** Select all open drives  
`su 1> sel -o`
- Step 2** Sets 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
```

---

## Reset mode sense values

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

- Step 1** Loads the default values  
`su 10> script mode_sense BF A0`
- Step 2** Clear mode data length  
`su 11> mdb 0x0 0`
- Step 3** Save the default values  
`su 12> script mode_select 11 AC`



This chapter contains the troubleshooting information, maintenance precautions, removal and replacement procedures, and a list of field replacement units (FRU) on either a Barracuda 4 or a Barracuda 4LP used in the Embedded Disk 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 Embedded Disk drive.

---

### Preparation

Observe the electrostatic discharge procedures described in the "Electrostatic discharge protection" section on page xiv, to prevent damage to the peripheral devices.

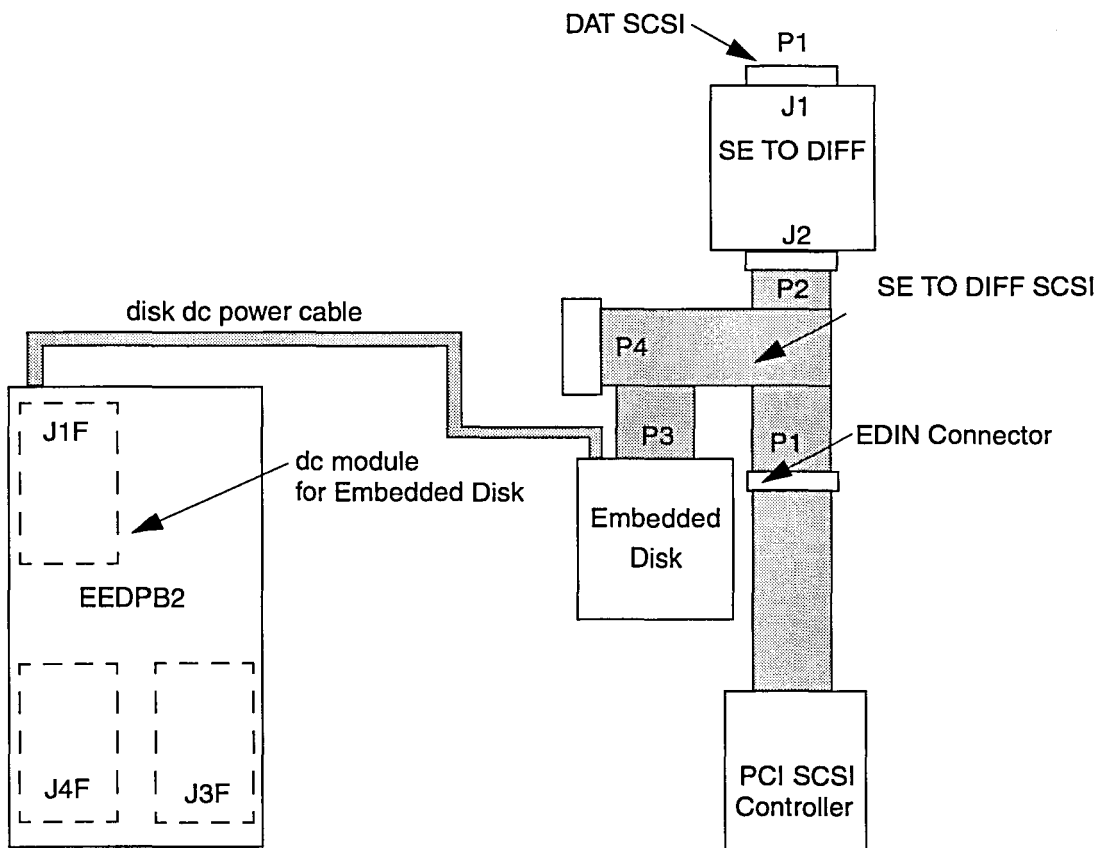
Both the Barracuda 4 and the Barracuda 4LP used as an Embedded Disk are single Field Replaceable Units (FRU) and do not contain any field-serviceable parts. Troubleshooting procedures described in this section are limited to verifying that the disk is operational and a valid connection is established.

## Checking the Embedded Disk connections

Check the cables connections and EEDPB2 by using this check list:

- Step 1** Check the disk SCSI cable between the SE TO DIFF Converter Board and the Embedded Disk. Refer to Figure 16.and Figure 17 on page 51 for locations.
- Step 2** Check the disk dc power cable between the Exemplar Embedded Disk Power Board (EEDPB2) and the Embedded Disk. Refer to Figure 16.
- Step 3** Check the SCSI cable between the EDIN bulkhead connector and the SE TO DIFF Converter. Refer to Figure 16.

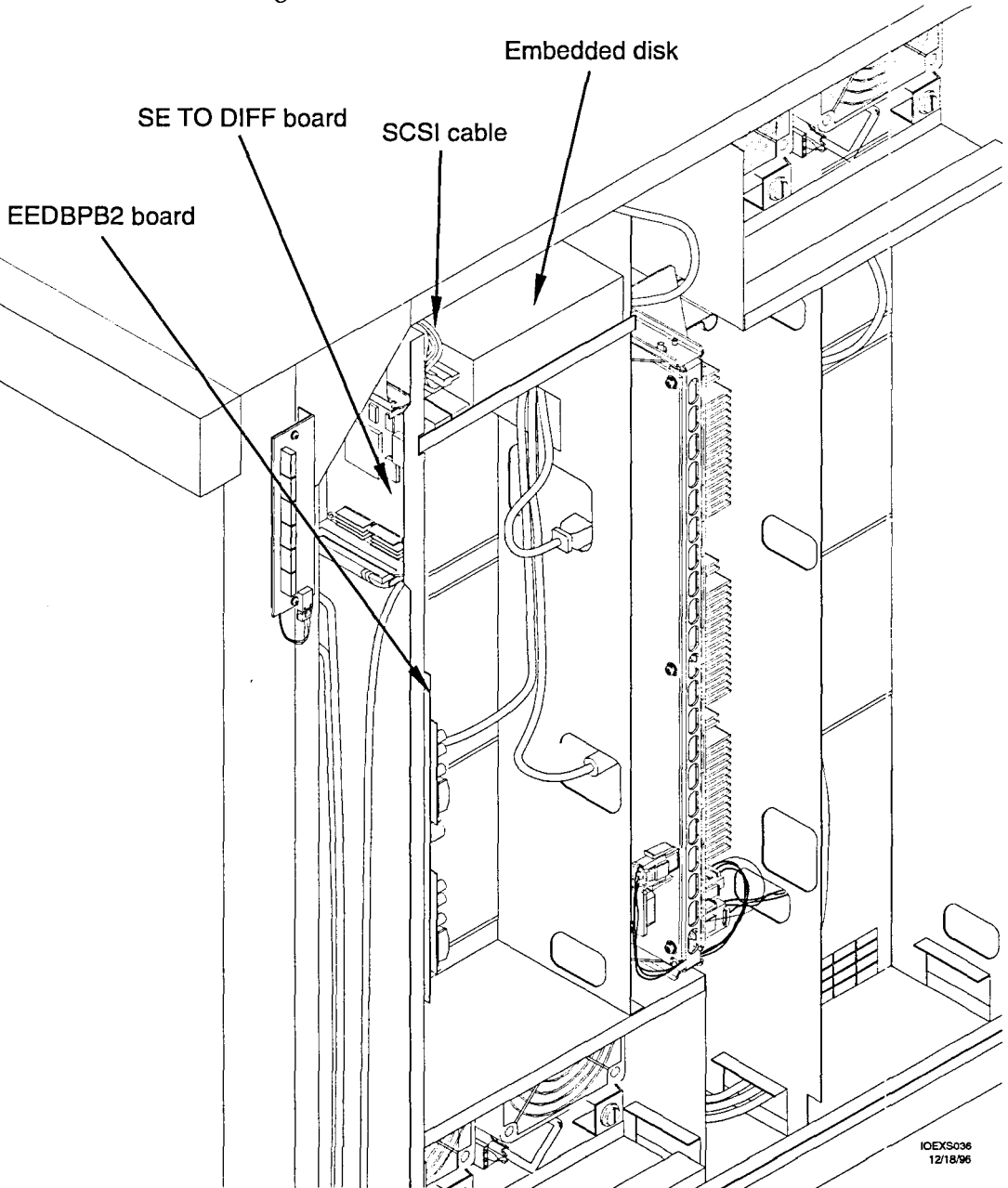
Figure 16 Diagram of Embedded Disk configuration



**Step 4** Check the LEDs on the EEDPD2 for power.

**Step 5** Check the dc module on the upper portion of the EEDPB2 for proper installation. Figure 17 shows the location.

**Figure 17** Embedded Disk configuration



---

## 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 Embedded Disk:

**Step 1** Verify the firmware revision by referring to the "Checking the firmware" section on page 37 of chapter 5 for the Barracuda 4 configuration or the "Checking the firmware" section on page 43 of chapter 6 for the Barracuda 4LP configuration.

**Step 2** From the OBP command prompt enter:

```
obp>show children
```

This command will show the disk, if you can talk to the SCSI controller, and the SCSI controller 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 Embedded Disk. Diagnostics are described in the next section.

If the diagnostics determine that the controller and or the disk is defective, replace the PCI SCSI controller and or the Embedded 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 the 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

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

---

### Overview

The `ctest` utility provides a graphical interface to the diagnostic environment. Diagnostics that test the SCSI Interface to the Embedded 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 is one or more diagnostic *subtests*. The Class 3 EPIC PCI Access Test for testing the controller and the Class 4 Qlogic Mailbox Test can 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

**The write enable option must be on in order for the SCSI Write Test to write data to the disk. Do not do this if you want to retain the data on your root device.**

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 Embedded Disk and there is a SCSI cable or Embedded 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 Embedded Disk. Data in phase occurs in this test. Failure of this test indicates a faulty SCSI cable to the Embedded Disk or an Embedded Disk problem.

The SCSI Read Test determines if the Embedded 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 an Embedded 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.

---

## Caution

---

**Do not enable writes to the Embedded Disk drive if you want to retain the data on it.**

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 `cctest` :
- ```
/spp/bin/cctest -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 FCI Ultra SCSI controller resides. Valid entries can be any of the values from the first column in Table 16.

**Table 16** 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 16 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. For the Embedded Disk, the SCSI ID is usually set to 2.

### *Logical Unit Number*

The logical unit number of the device, expressed in hexadecimal. For the Embedded Disk, the default parameter 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. You will see the following in the Console window:

```
Execution Starting.
```

```
.....
```

**Step 8** If the test completes (successfully or unsuccessfully), the console window will display the following message:

```
Execution Completed.
```

If the test fails, an error message will be 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 only be accomplished 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 disk drive with `scsiutil`

The Embedded 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 Embedded 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.

---

## Removal and replacement

When the Barracuda 4 or Barracuda 4LP is used as an Embedded Disk configuration, it can be replaced or removed as follows:

---

### Preparation

Observe the electrostatic discharge procedures described in the "Electrostatic discharge protection" section on page xiv to prevent damage to the drive during removal.

---

## Caution

---

**Do not remove power from the Embedded Disk drive used in the HP SPP-UX file system until you have halted the HP SPP-UX OS by using the `/etc/shutdown` command. To do otherwise may cause a node crash and loss of data.**

---

### Removal of the Embedded Disk drive

To remove the embedded drive for service or replacement from the chassis, follow the procedure below:

**Step 1** Shut down the system with the `etc/shutdown` command.

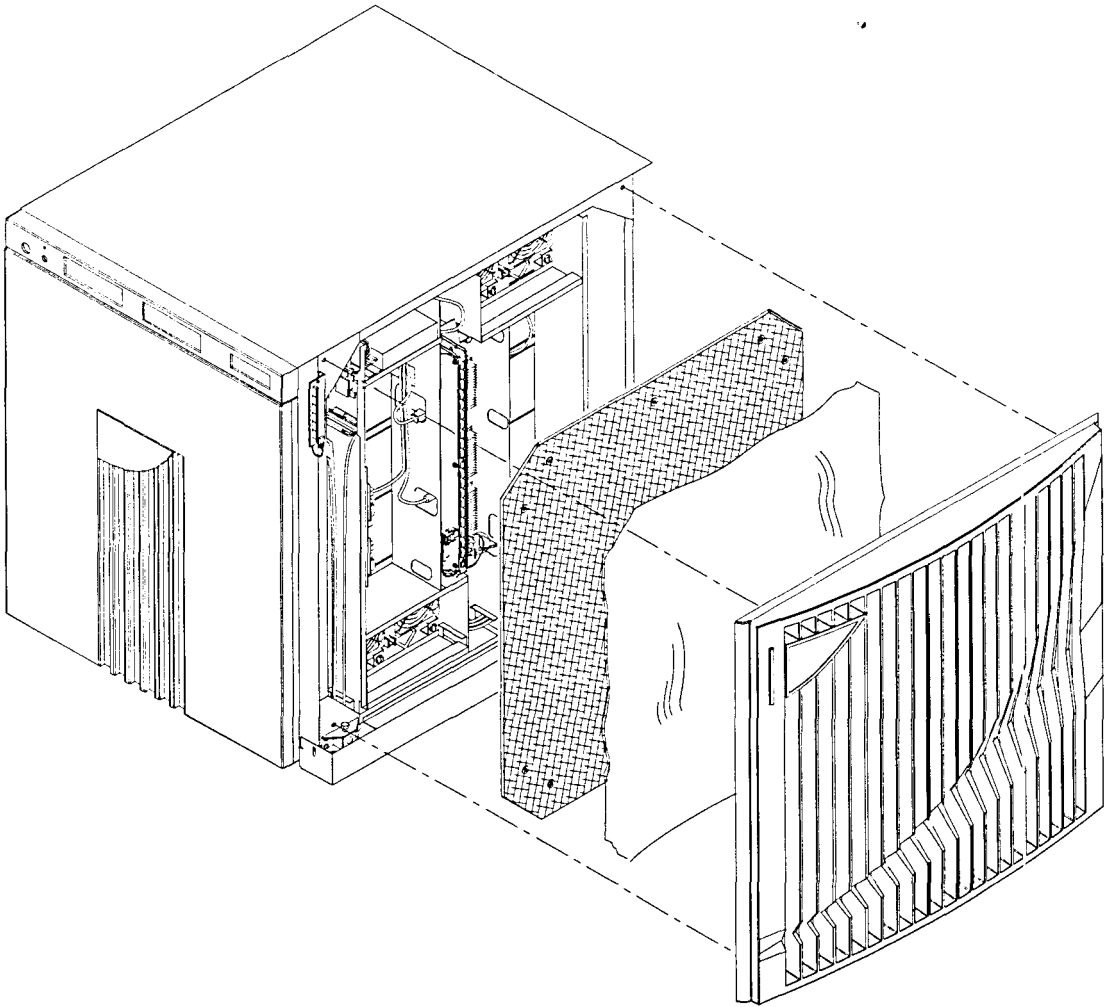
```
/etc/shutdown -h <time>
```

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 chassis by turning the key switch located on the left panel by the DAT drive to the OFF position.

- Step 3** Remove the front 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 18.

**Figure 18** Front cabinet skin, EMI panel, and filter

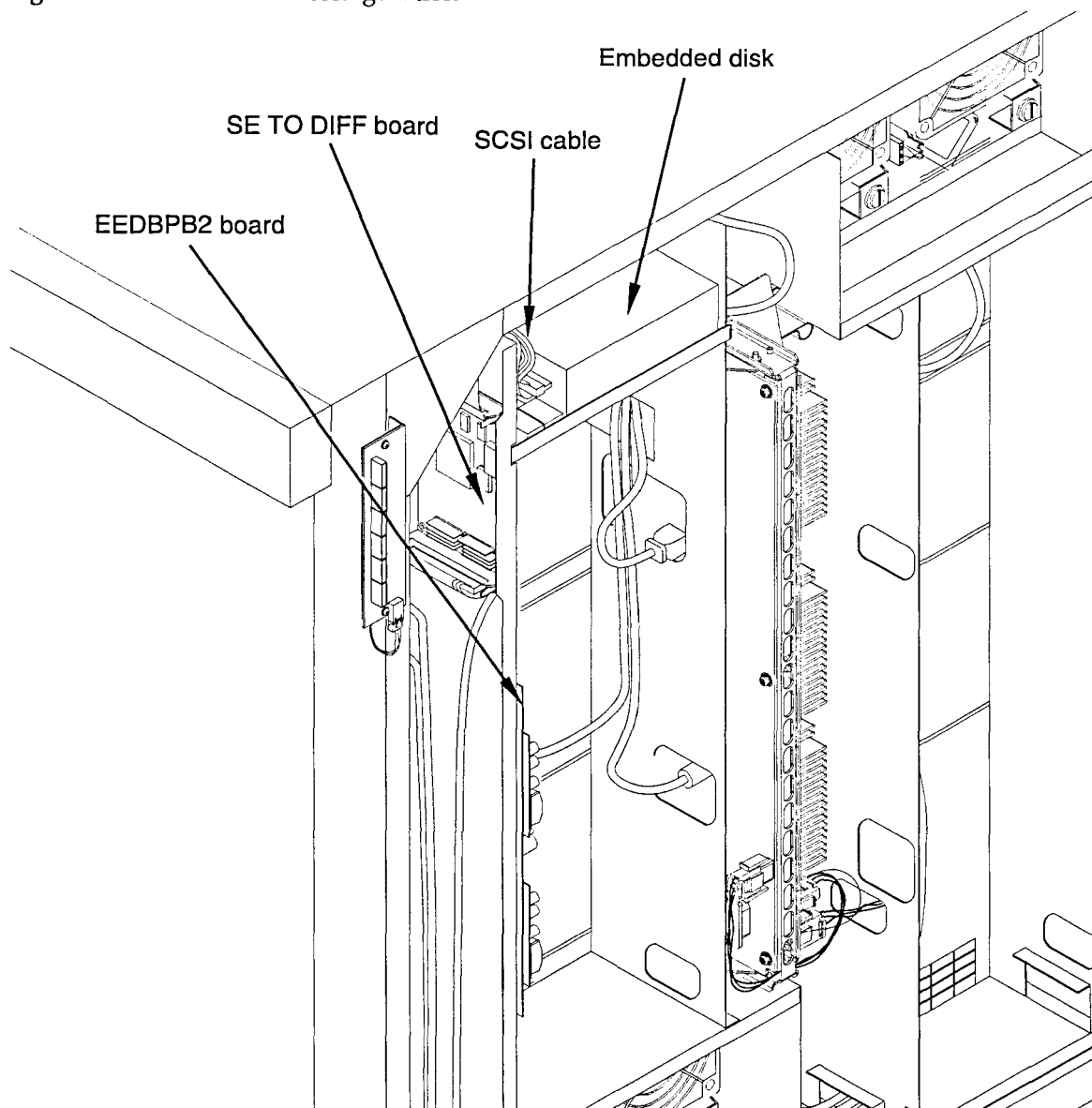


EXSM056  
12/17/96

- Step 4** Remove the filter by unfastening the velcro from the EMI panel.
- Step 5** Remove the front EMI panel by removing the screws on the sides of the panel as shown in Figure 18.

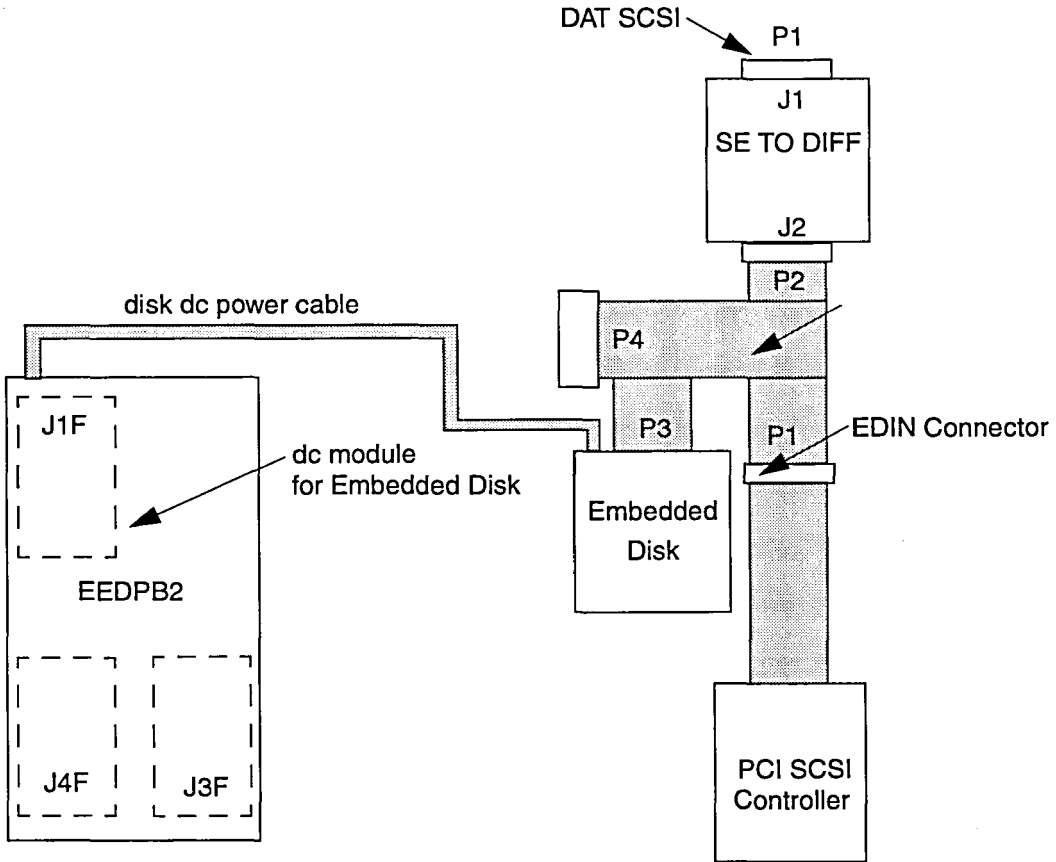
**Step 6** Locate the Embedded Disk in the upper left portion of the chassis. See Figure 19.

**Figure 19** Embedded Disk configuration



- Step 7** Disconnect the disk power cable between the EEDPB2 and the drive power connector as shown in Figure 19 on page 60 and Figure 20.
- Step 8** Disconnect the disk SCSI cable between the SCSI SE TO DIFF Converter board and the Embedded Disk as seen in Figure 19 on page 60 and Figure 20.

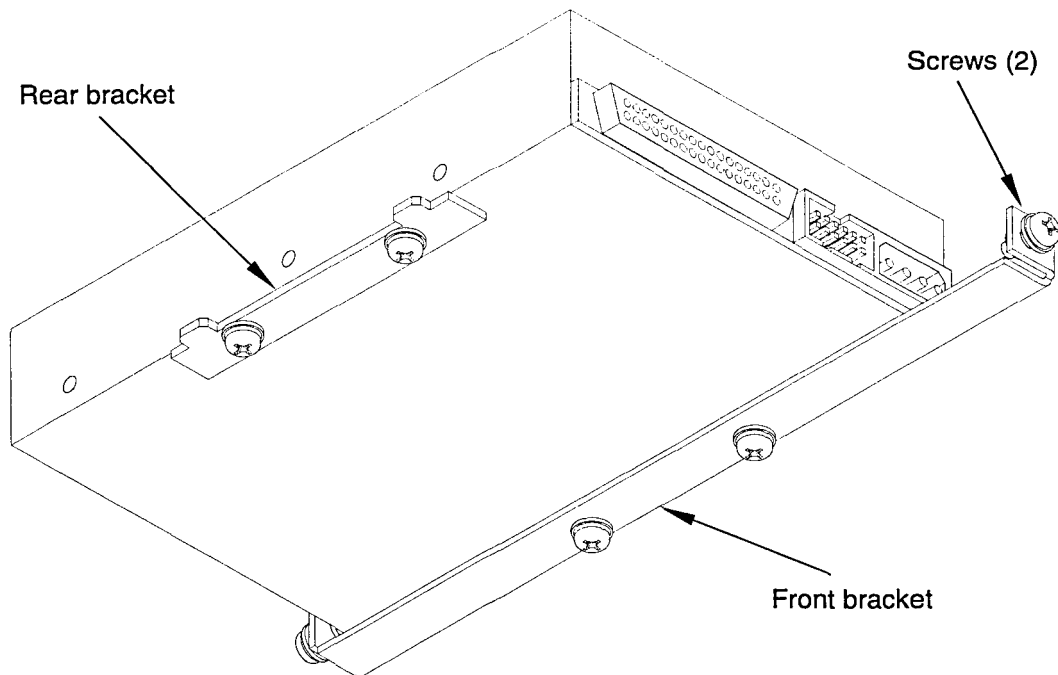
Figure 20 Diagram of Embedded Disk configuration



**Step 9** Remove the two front bracket screws as shown in the close-up view in Figure 21.

**Step 10** Lift up on the Embedded Disk drive from under the front bracket and slide it out of its chassis location. Refer to Figure 19 on page 60 and Figure 21 below as an aid.

**Figure 21** Embedded Disk



IOEXS009  
12/19/96

## Replacement of the Embedded Disk drive

To replace the Embedded Disk:

- Step 1** Check the replacement drive for the necessary brackets installed on the drive. A replacement Embedded Disk should arrive from Hewlett-Packard as shown in Figure 23 .
- Step 2** Set the SCSI ID [J5] to the ID as shown in Figure 22.

Figure 22 Embedded Disk SCSI ID

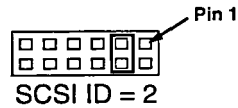
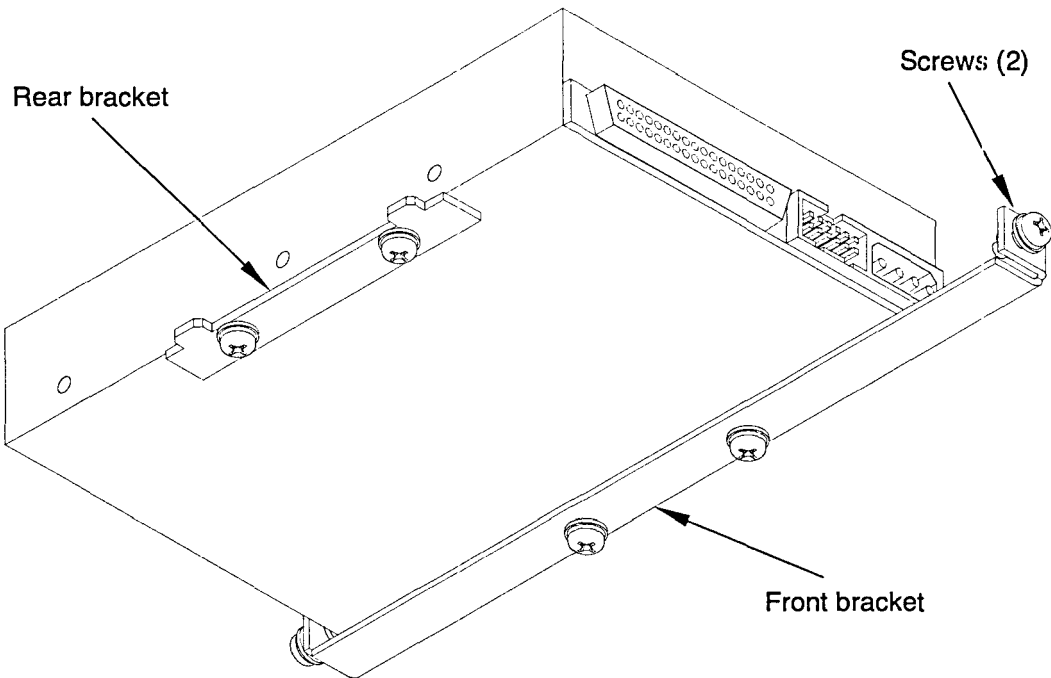


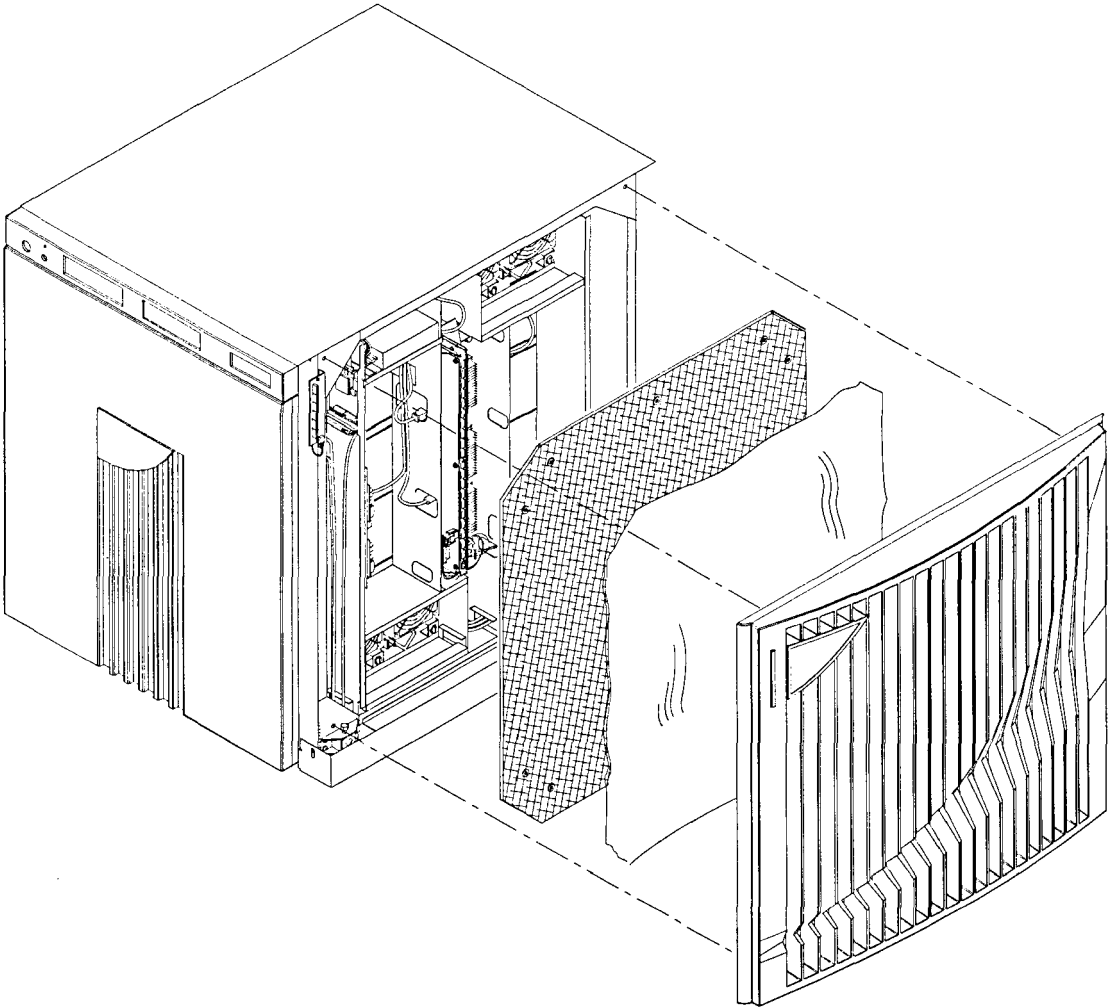
Figure 23 Embedded Disk with brackets



IOEXS008  
12/19/96

- Step 3** Remove the front 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 24.

**Figure 24** Front cabinet skin, EMI panel, and filter



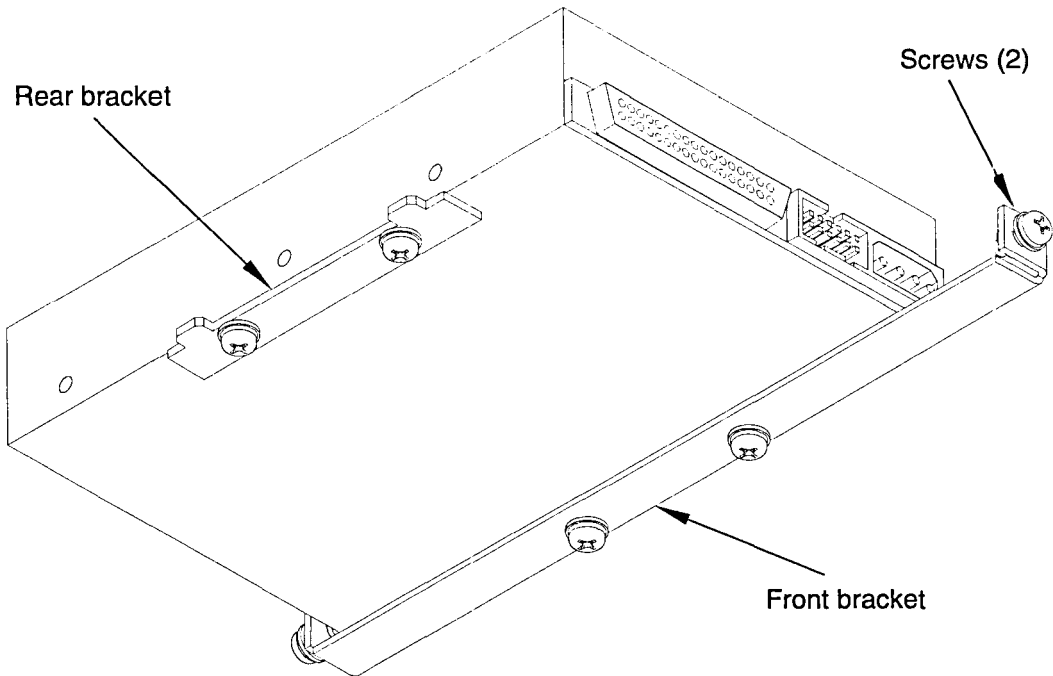
EXSM056  
12/17/96

- Step 4** Remove the front EMI panel by removing the screws on the sides of the panel as shown in Figure 24.

**Step 5** Face the front of the chassis and mate the two tabs of the Embedded Disk drive rear bracket with the two holes of the chassis wall. Refer to Figure 25 and Figure 26 on page 66.

**Step 6** Insure that the front bracket slides into the frame slots provided and secure with two screws as shown in Figure 25 and Figure 26 on page 66.

Figure 25 Embedded Disk with brackets



IOEXS009  
12/19/96

**Step 7** Attach the disk power cable between the EEDPB2 (Exemplar Embedded Disk Power Board) and the drive connector on the rear of the drive. Refer to Figure 25 and Figure 27 on page 67.

**Step 8** Attach the disk SCSI cable between the SCSI connector on the SE-to-DIFF Converter board to the SCSI connector on the rear of the replacement drive.

**Figure 26** Embedded Disk configuration

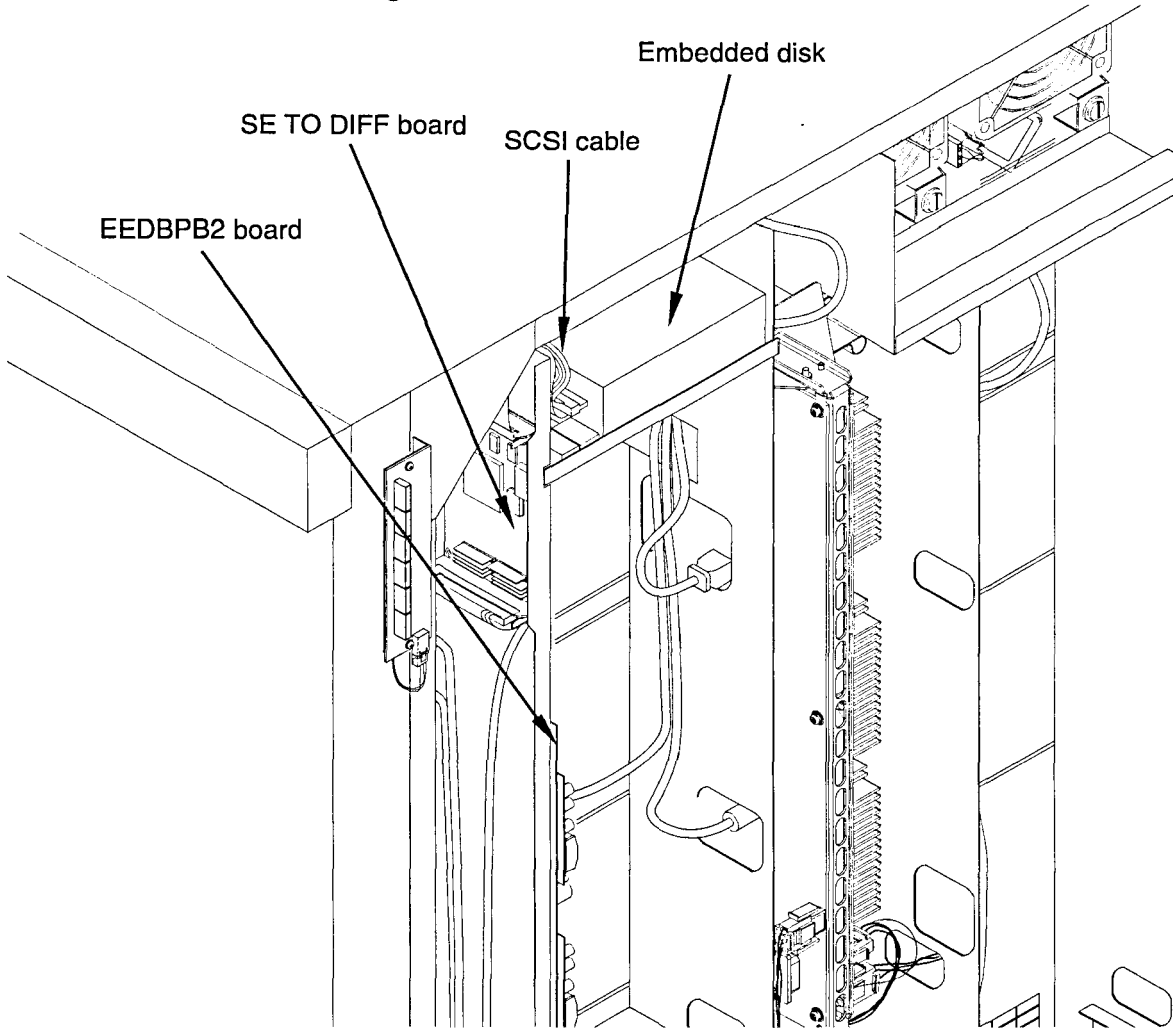
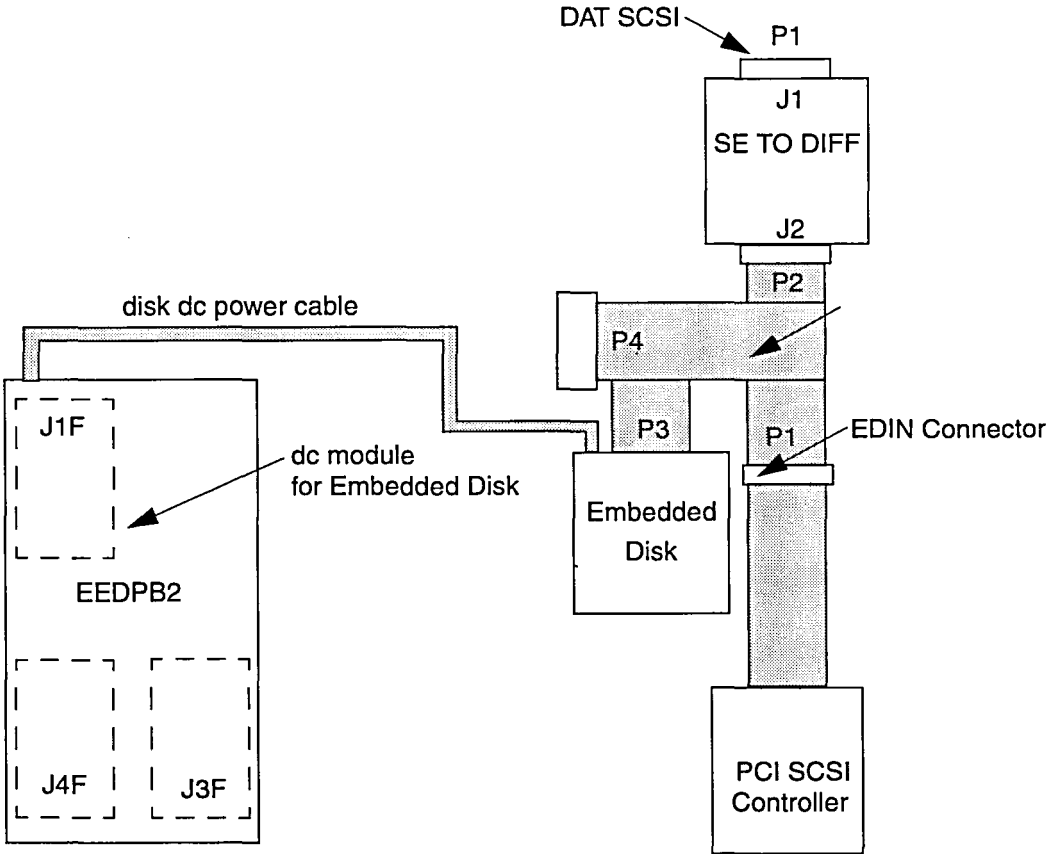
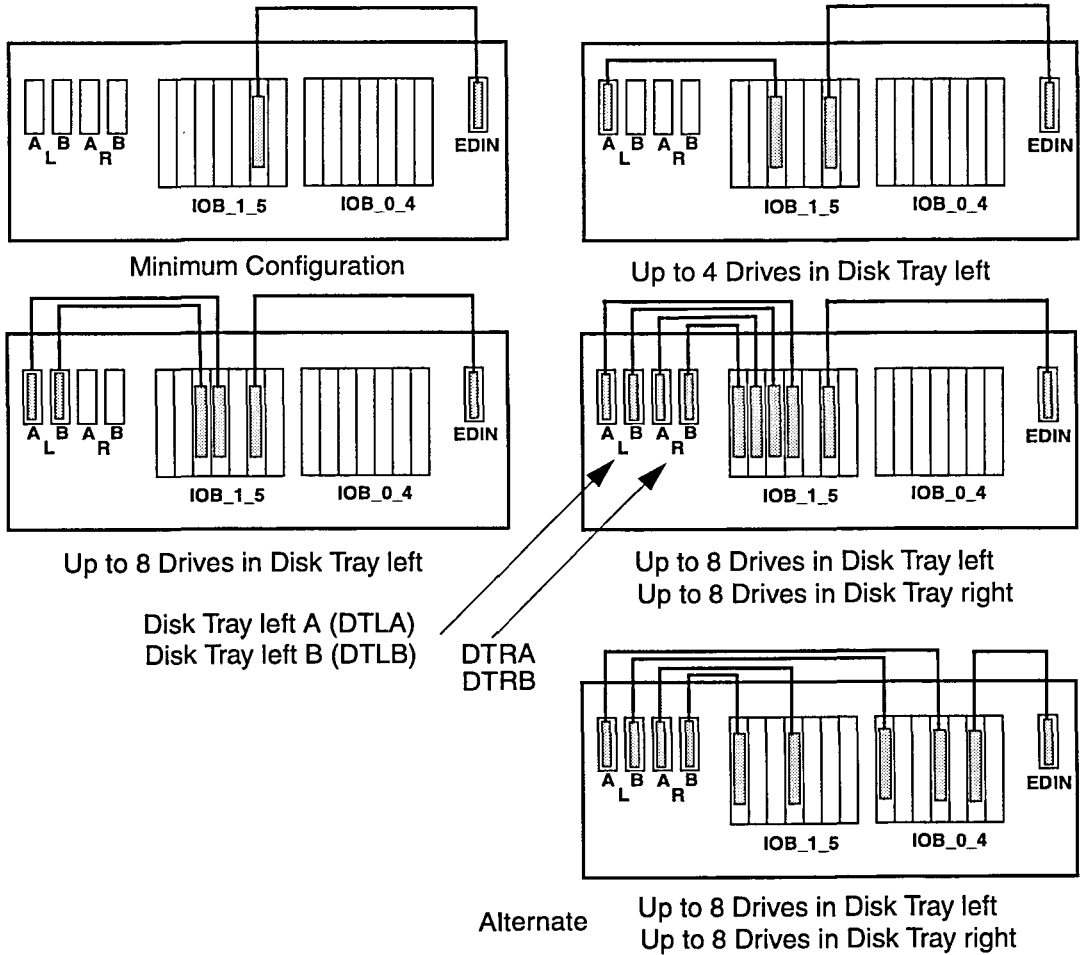


Figure 27 Diagram of Embedded Disk configuration



**Step 9** Install the SCSI cable between the PCI Card Cage and the EDIN connector on the left side of the server. See Figure 28 and use either location as shown.

**Figure 28** PCI SCSI recommended configuration



- Step 10** Integrate the drive into the server by referring to the “Software integration” section on page 34 in chapter 4.
- Step 11** Check the firmware revision on the drive. It must be at least the same or newer on the replacement drive as on the one removed. If the replacement drive does contain an older firmware revision, it must be updated. See the “Checking the firmware” section on page 37 of chapter 5 for the Barracuda 4 configuration or the “Checking the firmware” section on page 43 of chapter 6 for the Barracuda 4LP configuration.

---

## EEDPB2 dc module replacement

To replace the dc power module on the EEDPB2 perform the following steps:

Observe the electrostatic discharge procedures described in the "Electrostatic discharge protection" section on page xiv to prevent damage to the module during installation.

**Step 1** Shut down the system with the `etc/shutdown` command.

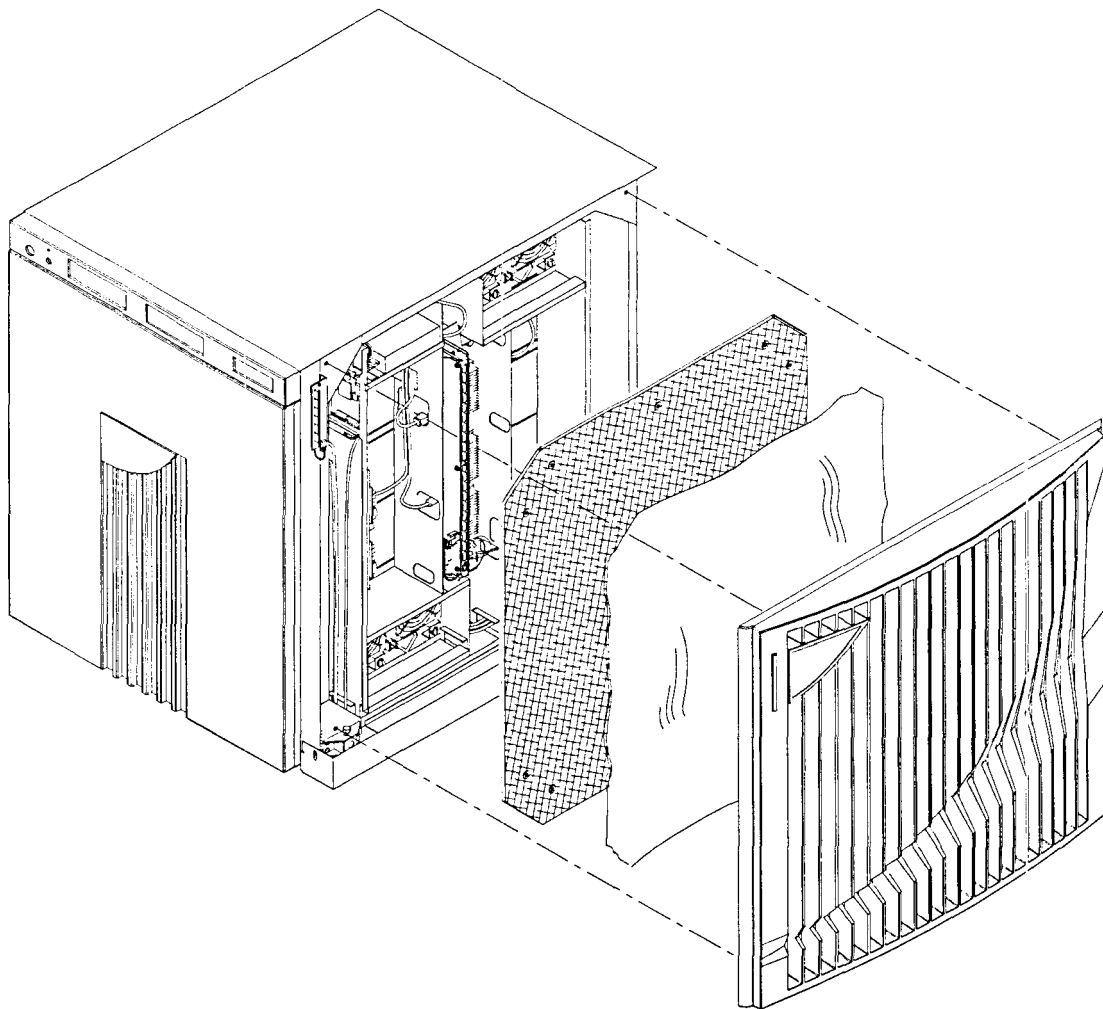
```
/etc/shutdown -h <time>
```

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** Remove the front 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 29.

**Figure 29** Front cabinet skin, EMI panel, and filter

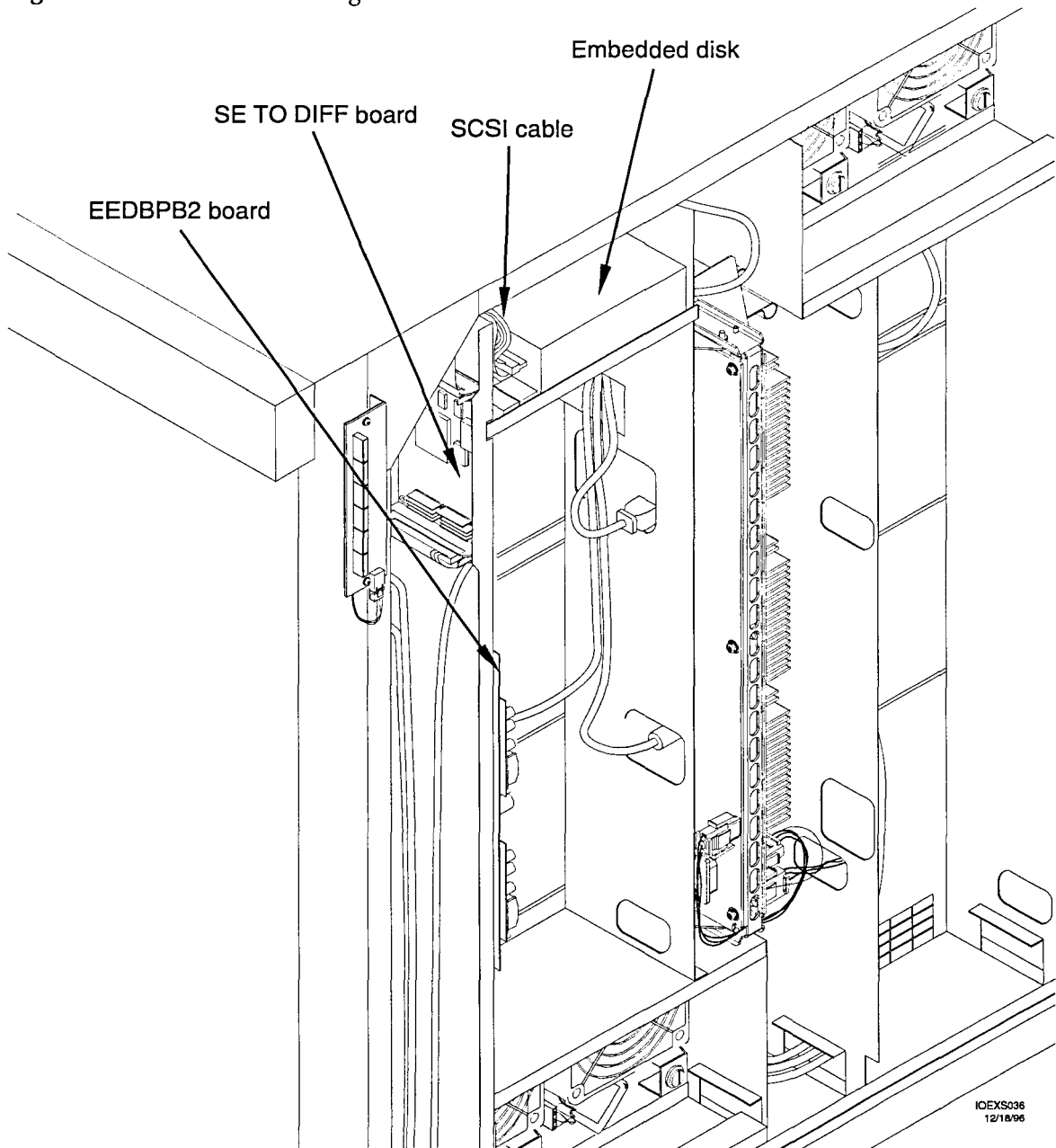


EXSM056  
12/17/96

- Step 4** Remove the filter by unfastening the velcro fasteners from the EMI panel.
- Step 5** Remove the front EMI panel by removing the screws on the sides of the panel as shown in Figure 29.

**Step 6** Locate the Embedded Disk drive in the upper left portion of the chassis. The Exemplar Embedded Disk Power Board (EEDPB2) is just below the drive. Refer to Figure 30..

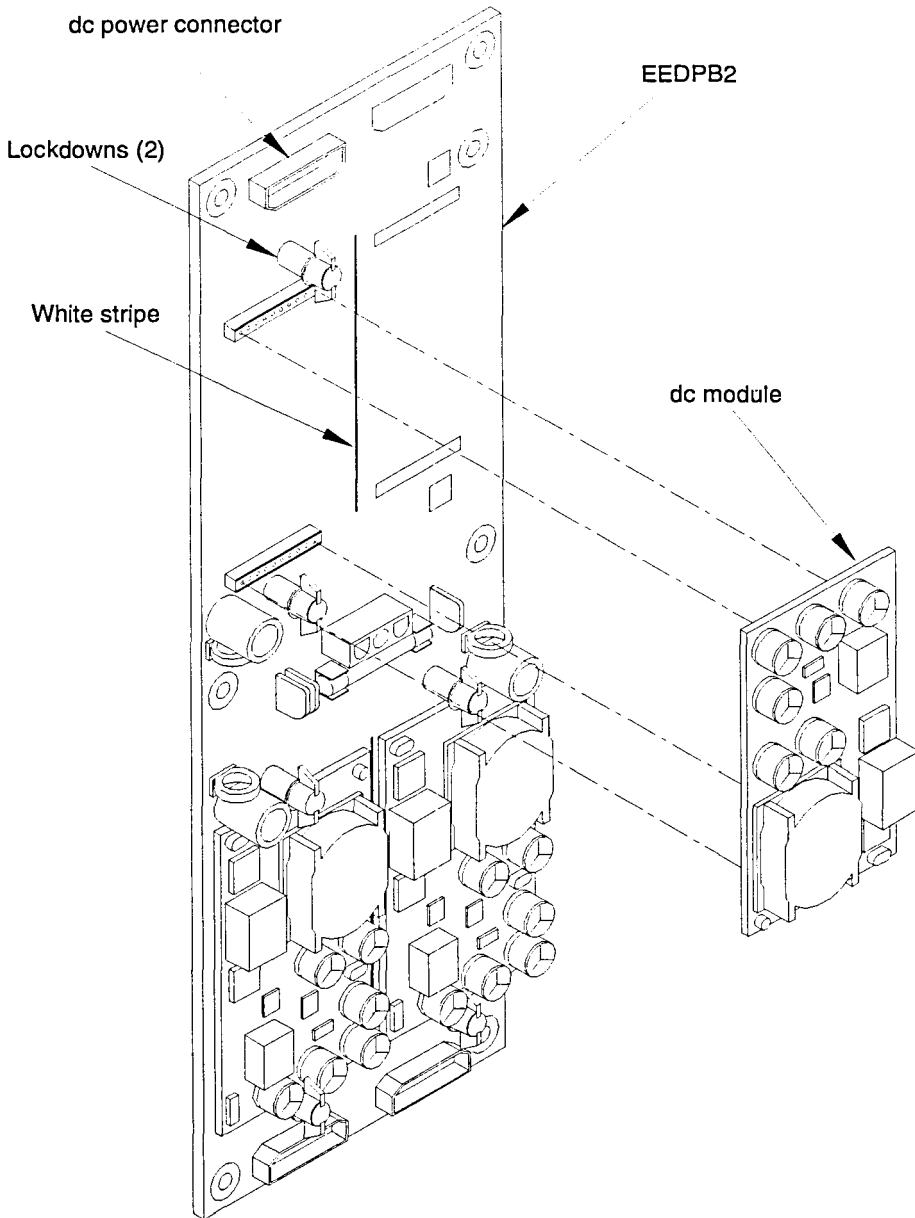
**Figure 30** Embedded Disk configuration



**Step 7** Replace the dc power module in the upper portion of the EEDPB2 in the orientation shown in Figure 31 flush with the EEDPB2.

**Step 8** Secure the dc module with the lockdowns as shown below.

Figure 31 Detail of EEDPB2 with dc module



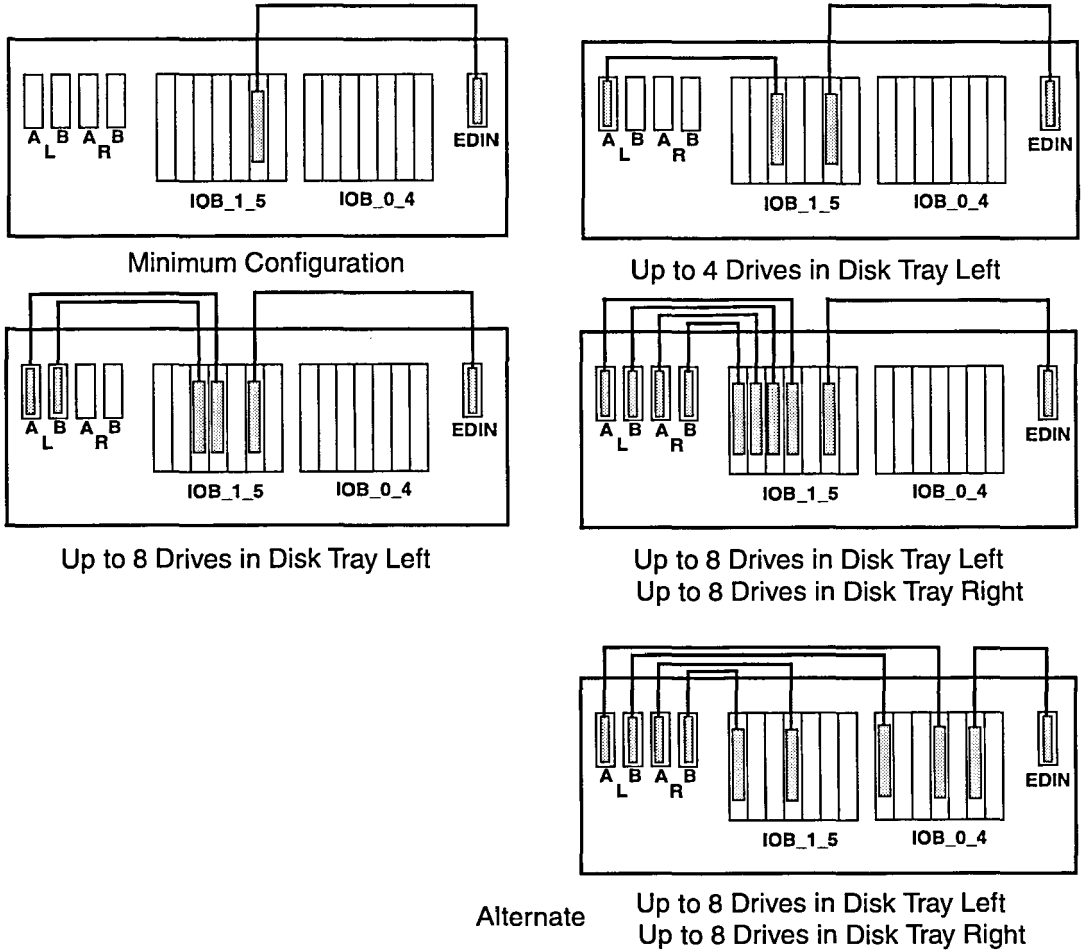
IOEK5047  
11/16/96

## SCSI cable replacement: PCI SCSI to EDIN

To replace the PCI Card Cage SCSI controller cable that connects to the EDIN connector:

- Step 1** Disconnect the cable between the EDIN bulkhead connector and the PCI Card Cage connector and replace with a new cable in the same EIOB slot. See Figure 32.

Figure 32 EDIN to PCI SCSI cable replacement



---

## FRUs for the Embedded Disk configuration

Table 8 contains the HP-CXD part numbers for the Field Replaceable Units (FRU) used with the Barracuda 4 or Barracuda 4LP in an Embedded Disk Drive configuration.

**Table 17** FRUs for the Embedded Disk

HP-CXD part number	Description
410-002464-200	Board Assembly, Excalibur Embedded Disk power (EEDPB2)
204-000035-200	Barracuda 4 F/W Diff ST15150WD disk drive
204-000049-200	Barracuda 4LP F/W Diff ST34371WD disk drive
200-001059-200	dc power supply module



---

# Index

---

## A

antistatic packaging xv  
associated documents xiii  
audience xi

---

## B

Barracuda 4 dc module location 9  
Barracuda 4 description 1  
Barracuda 4 firmware verification 37  
Barracuda 4 J01 terminator power 5  
Barracuda 4 option select jumper location 4  
Barracuda 4 used as a primary boot disk 1  
Barracuda 4LP dc module location 18  
Barracuda 4LP dc power current 13  
Barracuda 4LP dc power voltage 13  
Barracuda 4LP description 11  
Barracuda 4LP firmware verification 43  
Barracuda 4LP J2 terminator power 15  
Barracuda 4LP option select jumper location 14  
Barracuda 4LP used as a primary boot disk 11  
Bill of Materials 19

---

## C

cabinet skin  
  installation  
    front section 28  
  removal  
    front section 23, 59

---

## D

damage claims 19, 20  
dc module  
  location on EEDPB2 9, 18  
  power supply characteristics 8, 17  
  replacement on EEDPB2 73  
dc power requirements for Barracuda 4 3  
dc power requirements for Barracuda 4LP 13  
diagnostics  
  Class 3 EPIC PCI Access Test 53  
  Class 4 Qlogic Mailbox Test 53  
  Class 5 SCSI Interface Test 53  
  cxtest utility 53

  formatting with scsiutil 57  
  io3000 diagnostic suite 53  
  running SCSI Interface diagnostics 55  
  SCSI Inquiry Test 53  
  SCSI Read Capacity Test 54  
  SCSI Read Test 54  
  SCSI Test Unit Ready Test 53  
  SCSI Write Test 54  
  sector error repair 57

---

## E

EEDOB2  
  installation  
    dc module replacement 73  
EEDPB2  
  installation  
    dc module orientation 33  
Embedded Disk  
  checking  
    connections 50  
    firmware 52  
    using OBP list command 52  
    using OBP show children command 52  
  installation  
    checking for brackets 63  
    disk power cable 26  
    location 72  
    procedure 63  
    SCSI cable for embedded 26  
    setting SCSI ID 22, 63  
  removal  
    disk power cable 61  
    procedure 62  
    SCSI cable to Embedded Disk 61  
Embedded Disk brackets 25  
Embedded Disk location 24, 60  
Embedded Disk removal 58  
Embedded Disk replacement 52  
EMI  
  front panel removal 23, 59, 71  
  installation of panel 28  
ESD (Electronic Static Discharge) protection xiv

---

## F

filter removal 31, 59, 71  
firmware type ASA-1 (0000) for Barracuda 4 39  
firmware type ASA-2 for Barracuda 4 39

---

firmware upgrade  
Barracuda 4  
  ASA-1 type defaults 41  
  ASA-2 type defaults 41  
  checking the revision 37  
  checking the revision type and level 38  
  downloading 39  
  formatting the drive 41  
Barracuda 4LP  
  checking the revision 43, 44, 45  
  downloading 45  
  formatting the drive 47  
  load defaults 47  
  scsiutil utility 37, 43  
FRU (Field Replaceable Unit) 49  
FRU (Field Replaceable Unit) list 75

---

## I

installation  
  EEDPB2 dc module 33, 73  
  Embedded Disk 25  
  orientation of EEDPB2 dc module 33  
  overview 21  
  preparation 22

---

## J

jumpers 4  
  J01 default jumper installed 4  
  J01 pin assignments 5  
  J01 terminator power 4  
  J1-Auxiliary SCSI assignments 16  
  J1-Auxiliary sets SCSI ID 14  
  J2 option select header location 14  
  J4 enable and delay motor start 4  
  J4 parity checking 4  
  J4 pin assignments 6  
  J4 write protect function 4  
  J5 sets SCSI ID 4

---

## L

lockdown securement of dc module 73

---

## N

notational conventions xi

---

## O

ordering documents xiii  
overview of installation 21

---

## P

PCI Card Cage SCSI ports  
  recommended configuration 27  
PCI SCSI replacement 74  
power connection for Barracuda 4 4  
power connection for Barracuda 4LP 14  
power down of the server 22, 58  
power supply specifications  
  input voltage 8, 17  
  max input current 8, 17  
  operational environment 8, 17  
  output overvoltage shutdown 8, 17  
  output voltage regulation 8, 17  
power supply voltage specifications 17  
  max output 8, 17  
  max output current 8, 17  
  min output 8, 17  
  output ripple 8, 17  
  output voltage regulation 8, 17  
product information Barracuda 4  
  Hewlett Packard model number 1  
  Hewlett-Packard marketing number 1  
  Hewlett-Packard part number 1  
product information Barracuda 4LP  
  Hewlett Packard model number 11  
  Hewlett-Packard part number 11  
product information summary 1  
purpose xi

---

## R

removal  
  dc module replacement 70  
  Embedded Disk 58

---

## S

SCSI connector location for Barracuda 4 4  
SCSI connector location for Barracuda 4LP 14  
SCSI Interface diagnostics 55  
scsiutil  
  displaying the data 38, 44  
  formatting the drive 47  
  open command line option 37, 43  
  reading the drive description 37, 43  
  setting auto\_allocation 47

utility 37, 43

SE TO DIFF Converter SCSI connector 26, 61

shutdown prior to installation 22

shutdown prior to removal or replacement 58

specifications

Barracuda 4 capacity 2

Barracuda 4 dc power current 3

Barracuda 4 dc power voltage 3

Barracuda 4 environmental requirements 2

Barracuda 4 interface 2

Barracuda 4 latency 2

Barracuda 4 physical 2

Barracuda 4 seek time 2

Barracuda 4 size 2

Barracuda 4 start time 2

Barracuda 4 stop time 2

Barracuda 4 transfer rate 2

Barracuda 4LP capacity 12

Barracuda 4LP environmental requirements 12

Barracuda 4LP interface 12

Barracuda 4LP latency 12

Barracuda 4LP physical 12

Barracuda 4LP seek time 12

Barracuda 4LP Size 12

Barracuda 4LP start time 12

Barracuda 4LP stop time 12

Barracuda 4LP transfer rate 12

---

## T

TAC (Technical Assistance Center) xiii

TAC(Technical Assistance Center) 52

terminator power supplied to the SCSI bus 5, 15

---

## U

unpacking 19

---

## V

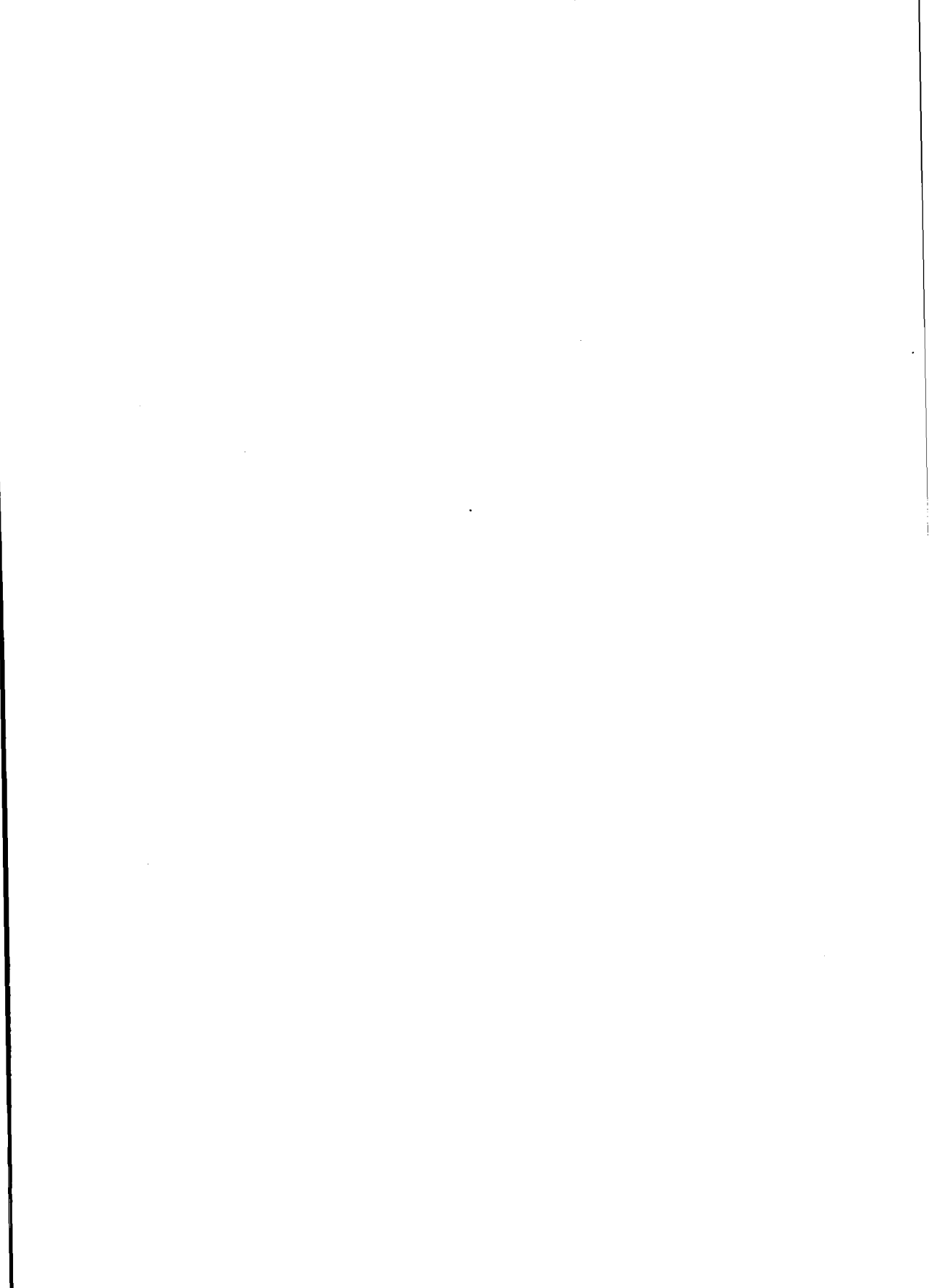
visual inspection 19

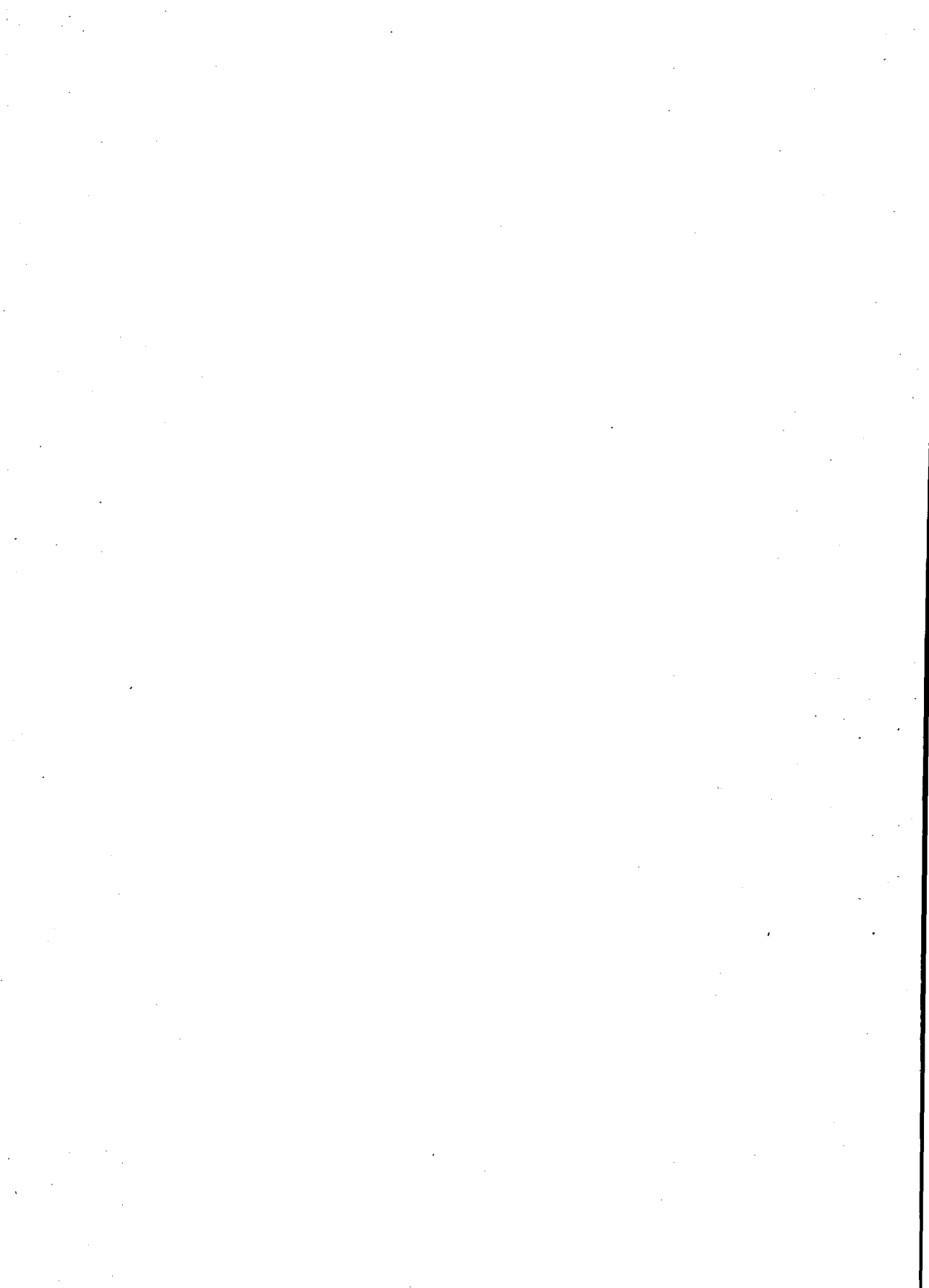
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## W

well-grounded work area xiv







11



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