COMPAQ

ProLiant 850R Servers

Maintenance and Service Guide

Second Edition (October 1997)
Document Part Number 298831-002
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Compaq Computer Corporation

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Compaq ProLiant 850R 6/200N
Compaq ProLiant 850R 6/200H
Maintenance and Service Guide

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Preface
About This Guide

This Maintenance and Service Guide is a troubleshooting guide that can be used for reference when servicing the Compaq ProLiant 850R Servers. Only authorized technicians trained by Compaq should attempt to repair this equipment.

WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, only authorized service technicians should attempt to repair this equipment. Improper repairs could create conditions that are hazardous.

Compaq Computer Corporation reserves the right to make changes to Compaq ProLiant 850R Servers without notice. This document contains the following chapters:

- **Chapter 1 - Illustrated Parts Catalog**
  Contains Compaq ProLiant 850R Servers exploded views and spares parts list.
- **Chapter 2 - Removal and Replacement Procedures**
  Contains steps for removing and replacing Compaq ProLiant 850R Servers spare parts.
- **Chapter 3 - Diagnostic Tools**
  Describes software and firmware diagnostic tools available for Compaq server products.
- **Chapter 4 - Switches and Jumpers**
  Provides switch and jumper information for the Compaq ProLiant 850R Servers.
- **Chapter 5 - Physical and Operating Specifications**
  Provides the physical and operating specifications for the Compaq ProLiant 850R Servers.

Symbols

The following text and symbols mark special messages throughout this guide:

WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.

CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.

IMPORTANT: Text set off in this manner presents clarifying information or specific instructions.

NOTE: Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technician Notes

WARNING: To reduce the risk of personal injury from electrical shock and hazardous energy levels, do not exceed the level of repair specified in these procedures. Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that are hazardous.

WARNING: To reduce the risk of electric shock or damage to the equipment:

- If the system has multiple power supplies, disconnect power from the system by unplugging all power cords from the power supplies.
- Do not disable the power cord grounding plug. The ground plug is an important safety feature.
- Plug the power cord into a grounded (earthed) electrical outlet that is easily accessible at all times.

CAUTION: To properly ventilate your system, you must provide at least 12 inches (30.5 cm) of clearance at the front and back of the computer.

IMPORTANT: Any indication of repair at the component level or modification of a printed wiring board may void any warranty.

Where to Go for Help

Major sources of additional information are as follows:

- Electronic services
- Compaq CDs
- Compaq Web Site (http://www.compaq.com)

Electronic Services

Users can download drivers, patches, and Compaq service updates from the following sources:

- Online services, such as CompuServe, Prodigy, and America Online, can be used if you are a member. Use the keywords below to access Compaq materials:
  - CompuServe - The keywords are “GO COMPAQ”.
  - Prodigy - Choose the “Jump” navigation command, then enter the keyword “COMPAQ”.
  - America Online - Enter the keyword “COMPAQ”.
- Internet: Questions can be submitted to Compaq Technical Support staff using the electronic mail address: support@compaq.com. Compaq-specific drivers, utilities, and white papers can be accessed using the address: FTP.COMPAQ.COM. Enter "anonymous" for the user name at the log-in prompt and enter your full Internet electronic mail address for the password. You can access the Compaq World Wide Web site through the Uniform Resource Locator (URL): http://www.compaq.com.
- Compaq Download Facility: Call 1-281-518-1418

Compaq CDs

Compaq offers the following CDs, which contain Compaq documentation and other information.

Compaq Systems Reference Library CD

Compaq Systems Reference Library CD is located in the Reference Information pack and includes the following online documents:

- Diagnostics
- Insight Manager documentation
- Integration TechNotes
- Part number lists
- SCSI and other options guides

- Security Management
- Server Maintenance and Service Guides (MSGs)
- Server reference guides

Compaq SmartStart and Support Software CD

Compaq SmartStart and Support Software CD is located in the Server Setup and Management pack and contains:

- System Configuration Utility software
- ROMPaq
- Drivers

Compaq Management CD

Compaq Management CD is located in the Server Setup and Management pack and contains:

- Insight Manager Utility software
- Online Help for the Insight Manager Utility

Compaq Web Site

The latest product updates and Compaq information are available on the Internet at the Compaq World Wide Web site. Access the site through the following address:

http://www.compaq.com

Other Information Sources

In addition to this guide, the following information sources are available:

- User Documentation, including the *Compaq ProLiant 850R Setup and Installation Guide*
- *Compaq Service Quick Reference Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- Compaq QuickFind
- Compaq Insight Manager

Chapter 1
Illustrated Parts Catalog

This chapter provides the illustrated parts breakdown and a spares parts list for the Compaq ProLiant 850R Servers. See Table 1-1 for the names of referenced spares parts.

Mechanical Parts Exploded View (Compaq ProLiant 850R 6/200H)

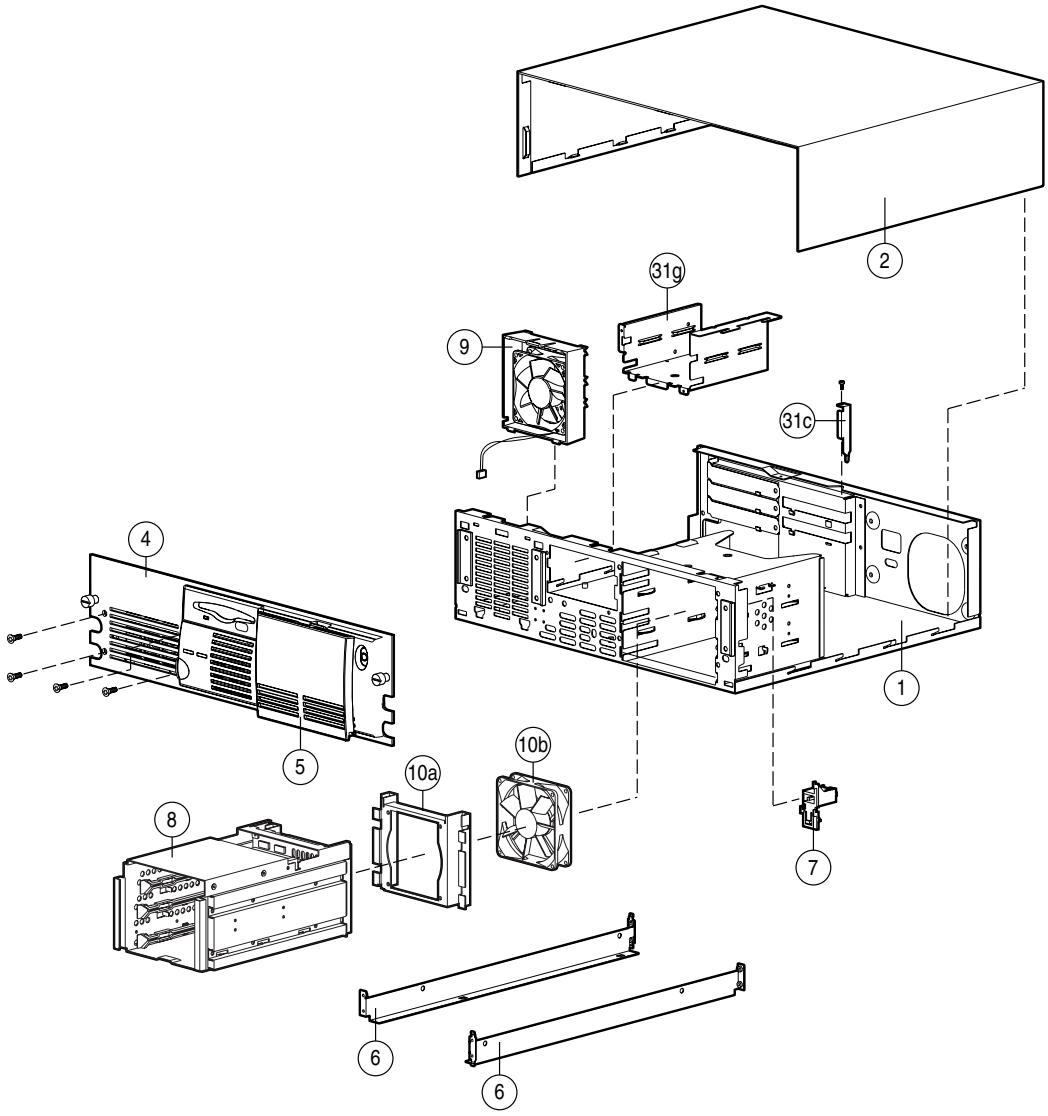

Figure 1-1. Mechanical Parts Exploded View of the Compaq ProLiant 850R 6/200H

System Components Exploded View (Compaq ProLiant 850R 6/200H)

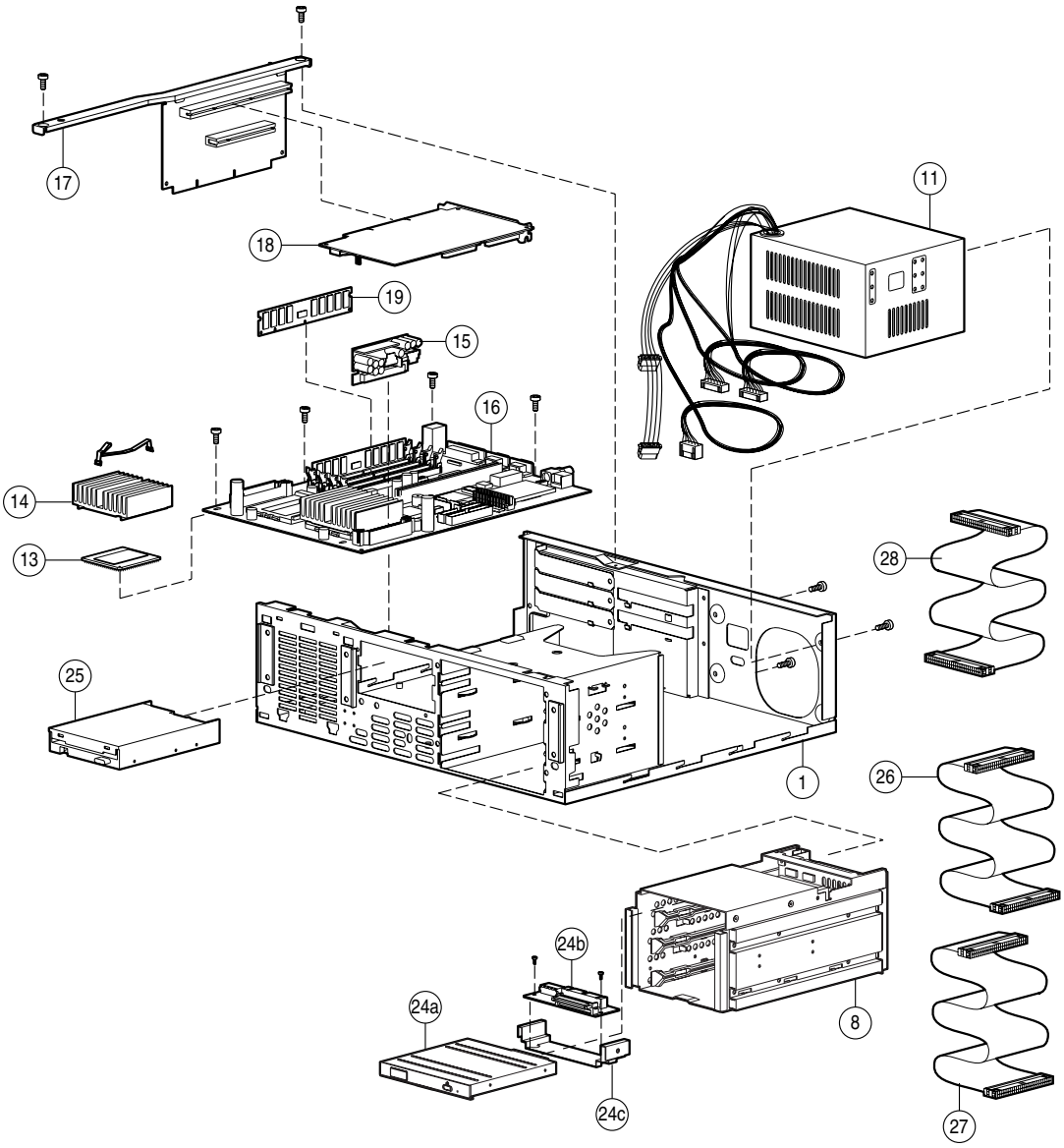

Figure 1-2. System Components Exploded View of the Compaq ProLiant 850R 6/200H Server

Mechanical Parts Exploded View (Compaq ProLiant 850R 6/200N)

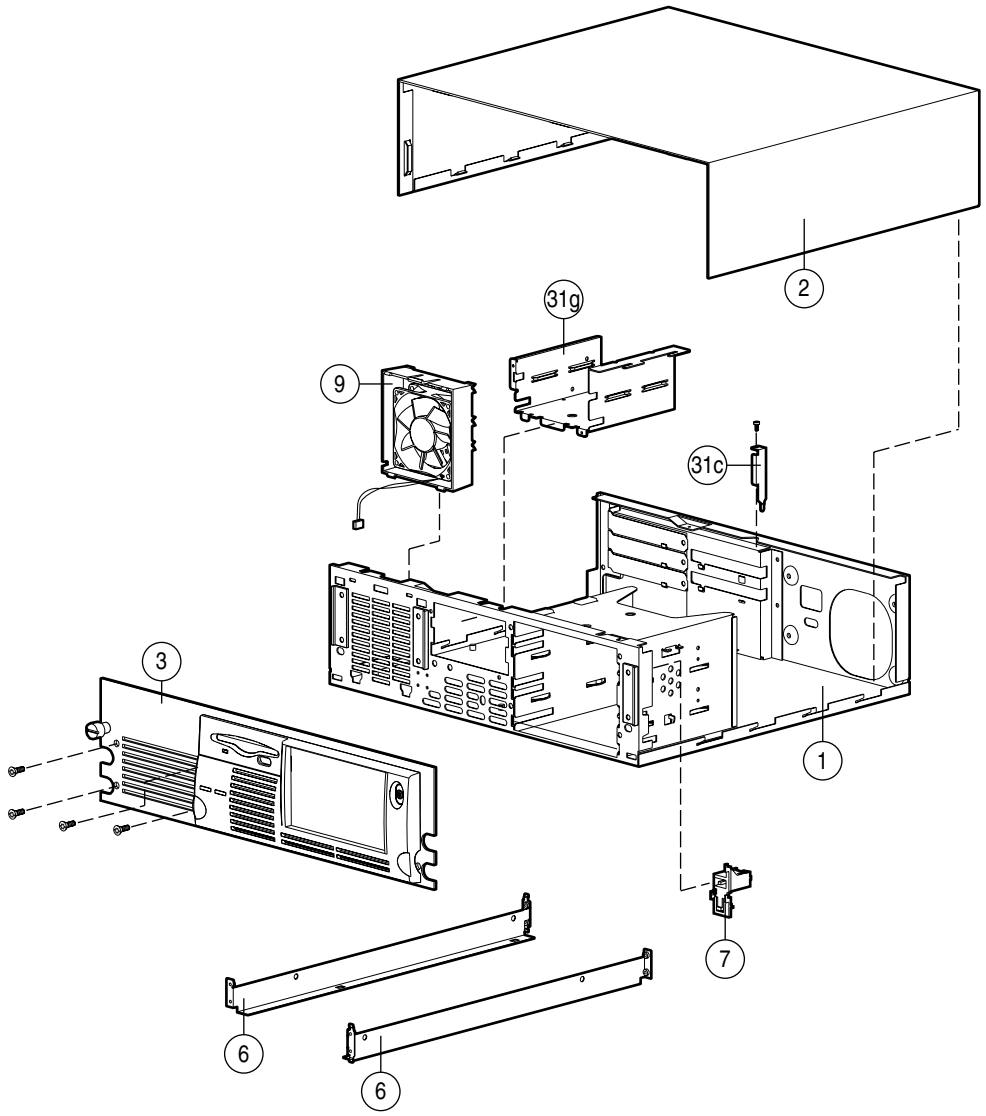

Figure 1-3. Mechanical Parts Exploded View of the Compaq ProLiant 850R 6/200N

System Components Exploded View (Compaq ProLiant 850R 6/200N))

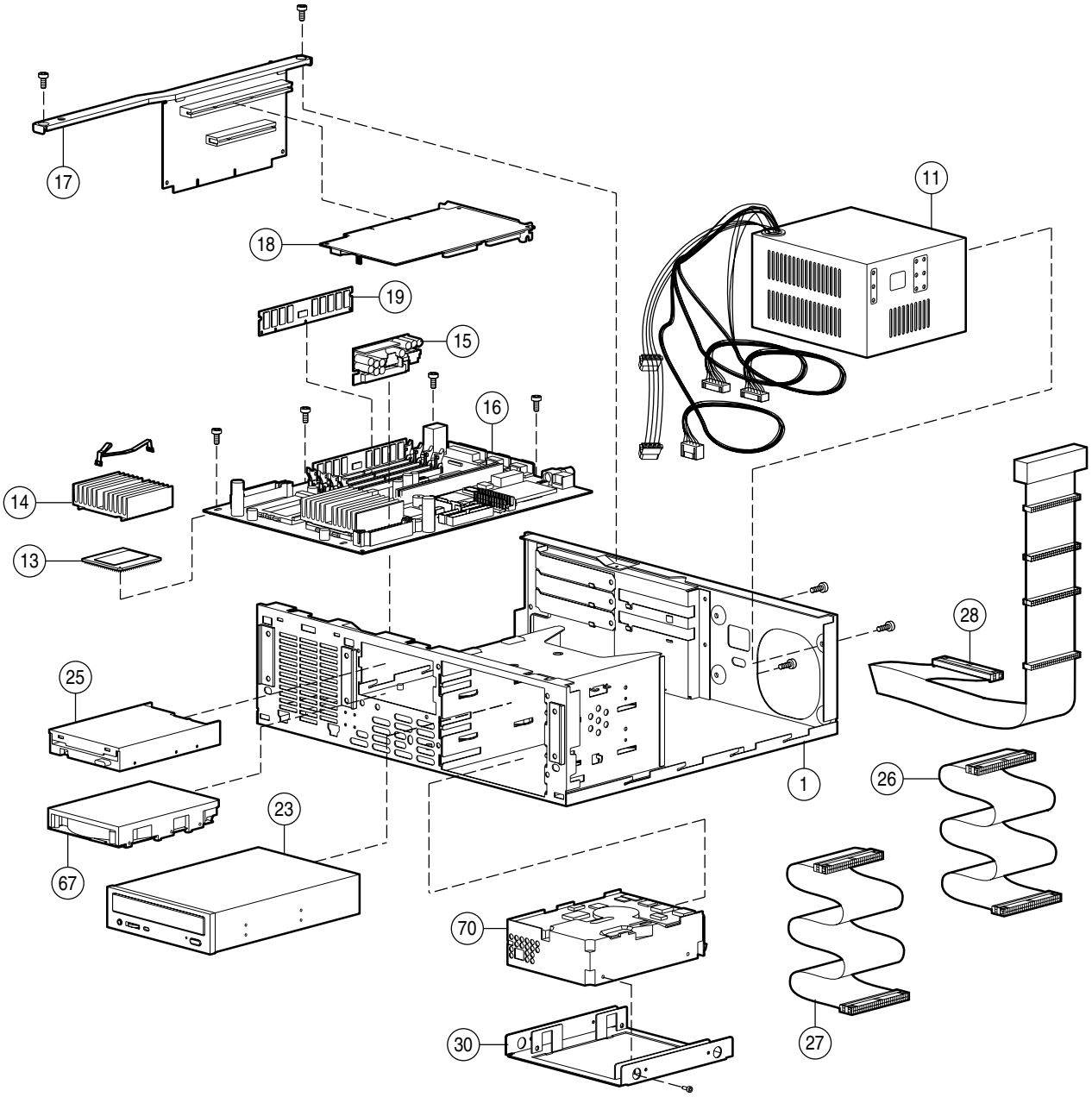

Figure 1-4. System Components Exploded View of the Compaq ProLiant 850R 6/200N

Spares Parts List

Table 1-1
Spares Parts List
Compaq ProLiant 850R Servers

Item	Description	Spares Part #
CHASSIS		
1	Chassis	298842-001
2	Server Cover	243089-001
3	Front Bezel (ProLiant 850R 6/200N only)	298841-001
4	Hot-Plug Front Bezel (ProLiant 850R 6/200H only)	298875-001
5	Hot-Plug Plastic Lens	167232-001
6	Support Rails	298845-001
7	Power Switch	298843-001
8	3-Bay Hot-Plug Drive Cage Assembly (ProLiant 850R 6/200H only) a) SCSI Backplane Board b) Mounting Bracket	167229-001
SYSTEM COMPONENTS		
9	92-mm Fan with Cable	298866-001
10	Hot-Plug Drive Cage Fan with Bracket (ProLiant 850R 6/200H only) a) Mounting Bracket b) Fan	298870-001
11	200W Power Supply	247134-001
12	External Replacement Battery	160274-001 *
	BOARDS	
13	686/200 Processor	221068-001
14	Heat Sink	185962-001
15	Processor Power Module	225529-001
16	686/200 System Board without Processor	298808-001
17	Riser Board with Brace	298806-001
18	Feature Board	298816-001
	MEMORY	
19	16-MB Dual Inline Memory Module (DIMM), 60ns (EDO; unbuffered)	269414-001
20	32-MB Dual Inline Memory Module (DIMM), 60ns (EDO; unbuffered)	269263-001 *
21	64-MB Dual Inline Memory Module (DIMM), 60ns (EDO; unbuffered)	269264-001 *
22	128-MB Dual Inline Memory Module (DIMM), 60ns (EDO; unbuffered)	269266-001 *

Continued

Spares Parts List - Compaq ProLiant 850R Servers *Continued*

Item	Description	Spares Parts #
	MASS STORAGE DEVICES	
23	8X IDE CD-ROM Drive (ProLiant 850R 6/200N only)	298849-001
24	8X IDE Low Profile CD-ROM Assembly (ProLiant 850R 6/200H only) a) Low-Profile CD-ROM Drive b) Paddle Board c) Mounting Hardware	167230-001
25	1.44 MB, 3.5-inch Diskette Drive (3-mode)	147243-001
	CABLES	
26	CD-ROM Drive Data Cable	298848-001
27	Diskette Drive Cable	298856-001
28	Cable Kit (Miscellaneous SCSI) a) Point-to-Point (ProLiant 850R 6/200H only) b) Four-Device Wide SCSI with Terminator (ProLiant 850R 6/200N only)	167246-001
29	External SCSI Cable	298865-001 *
	MISCELLANEOUS	
30	Hard Drive Mounting Bracket (3.5-inch to 5.25-inch)	243231-001
31	Miscellaneous Hardware Kit	298868-001
	a) slot cover *	
	b) power switch bracket, cover, spring, plunger *	
	c) bracket, board retainer	
	d) bracket, feature board *	
	e) bracket, Wide-Ultra SCSI *	
	f) bracket, SMART-2 *	
	g) diskette drive cage	
	h) blank bezel, half-height *	
32	1.5-inch SCSI Terminator	295947-001 *
33	Wide-to-Narrow SCSI Adapter	189638-001 *
34	Locking Bracket Kit	199109-001 *
35	Miscellaneous Screw Kit	298869-001 *
36	Maintenance and Service Guide	298847-001 *
37	Setup and Installation Guide	298846-001 *
38	1-inch Drive Tray, SCSI Connector (ProLiant 850R 6/200H only)	242801-001 *
39	1-inch Drive Tray, Fast-Wide Connector (ProLiant 850R 6/200H only)	199880-001 *
40	1-Inch Drive Tray, Fast SCSI-2 Connector (ProLiant 850R 6/200H only)	242593-001 *
OPTIONS		
41	Cable Option Kit	167227-B21 *
42	Hot-Plug Conversion Kit	167206-B21 *
43	Low-Profile CD-ROM	167226-B21 *

Continued

Spares Parts List - Compaq ProLiant 850R Servers *Continued*

Item	Description	Spares Parts #
	KEYBOARDS	
44	Keyboard, U.S. English	160648-101 *
45	Keyboard, U.K. English	160648-103 *
46	Keyboard, German	160648-104 *
47	Keyboard, French	160648-105 *
48	Keyboard, Italian	160648-106 *
49	Keyboard, Spanish	160648-107 *
50	Keyboard, Danish	160648-108 *
51	Keyboard, Norwegian	160648-109 *
52	Keyboard, Swedish/Finnish	160648-110 *
53	Keyboard, Swiss	160648-111 *
54	Keyboard, French Canadian	160648-112 *
55	Keyboard, Portuguese	160648-113 *
56	Keyboard, Turkish	160648-114 *
57	Keyboard, Greek	160648-115 *
58	Keyboard, Latin American	160648-116 *
59	Keyboard, Arabic	160648-117 *
60	Keyboard, Belgian	160648-118 *
61	Keyboard, BHCSY	160648-120 *
62	Keyboard, Hungary	160648-121 *
63	Keyboard, Polish	160648-122 *
64	Keyboard, Slovakia	160648-123 *
65	Keyboard, Russia	160648-124 *
66	Keyboard, Czech	160648-129 *
	FIXED DISK DRIVES	
67	2.1-GB Fast-Wide SCSI-2 (ProLiant 850R 6/200N only)	199644-001
68	2.1-GB Fast-Wide SCSI-2 (ProLiant 850R 6/200H only)	199876-001 *
69	4.3-GB Fast-Wide SCSI-2 (ProLiant 850R 6/200N only)	199599-001 *
70	9.1-GB Fast-Wide SCSI-2 (ProLiant 850R 6/200N only)	199885-001
71	2.1-GB Wide-Ultra SCSI (ProLiant 850R 6/200N only)	247409-001 *
72	2.1-GB Wide-Ultra SCSI (ProLiant 850R 6/200H only)	242583-001 *
73	4.3-GB Wide-Ultra SCSI (ProLiant 850R 6/200N only)	247408-001 *
74	4.3-GB Wide-Ultra SCSI (ProLiant 850R 6/200H only)	272577-001 *
75	9.1-GB Wide-Ultra SCSI (ProLiant 850R 6/200N only)	199886-001 *
76	4.3-GB Hot-Pluggable Wide-Ultra	242622-001 *
77	2.1-GB Hot-Pluggable Wide-Ultra	242603-001 *
78	2.1-GB Hot-Pluggable Fast-Wide SCSI-2	199878-001 *

Continued

Spares Parts List - Compaq ProLiant 850R Servers *Continued*

Item	Description	Spares Parts #
	CONTROLLERS	
79	SMART-2/P Controller	194754-001 *
80	NetFlex-3/P Controller	169811-001 *
81	Wide-Ultra SCSI PCI Controller	272515-001 *
82	NetFlex-3 100 Base-TX Upgrade Module	169805-001 *
83	NetFlex-3 100 VG-AnyLAN Upgrade Module	169803-001 *
84	10/100 TX PCI UTP Controller	169849-001 *
85	10 T, PCI UTP Controller	242501-001 *
86	4/16 TR PCI IBM UTP/STP Controller	199764-001 *
87	50-Pin to 68-Pin Adapter (Standard to Wide)	189638-001 *
88	68-Pin to 50-Pin Adapter (Wide to Standard)	189631-001 *
89	NIC 10/100 Class B	219414-001 *

* Not Shown

Chapter 2
Removal and Replacement Procedures

This chapter provides subassembly/module-level removal and replacement procedures for the Compaq ProLiant 850R Servers. After completing all necessary removal and replacement procedures, run the diagnostics program to verify that all components operate properly.

To service Compaq ProLiant 850R Servers, you may need the following:

- Torx T-15 screwdriver
- Torx T-8 screwdriver
- From the Compaq SmartStart and Support Software CD:
  - System Configuration Utility software
  - Drive Array Advanced Diagnostics software
  - Diagnostics software

Electrostatic Discharge Information

A discharge of static electricity can damage static-sensitive devices or microcircuitry. Proper packaging and grounding techniques are necessary precautions to prevent damage. To prevent electrostatic damage, observe the following precautions:

- Transport products in static-safe containers such as conductive tubes, bags, or boxes.
- Keep electrostatic-sensitive parts in their containers until they arrive at static-free stations.
- Cover workstations with approved static-dissipating material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Keep work area free of non-conductive materials such as ordinary plastic assembly aids and foam packing.
- Make sure you are always properly grounded when touching a static-sensitive component or assembly.
- Avoid touching pins, leads, or circuitry.
- Always place drives PCB-assembly-side down.
- Use conductive field service tools.

Symbols in Equipment

	**WARNING:** Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce risk of injury from a hot component, allow the surface to cool before touching.
	**WARNING:** Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. The enclosed area contains no operator serviceable parts. To reduce risk of injury from electrical shock hazards, do not open this enclosure.
	**WARNING:** Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. To reduce risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.
	**WARNING:** This label or equivalent is located on the surface of your CD-ROM drive. This label indicates that the product is classified as a CLASS 1 LASER PRODUCT.

Preparation Procedures

Before beginning any of the removal and replacement procedures, complete the following steps:

1. Turn OFF the server and any peripheral devices.
2. Disconnect the AC power cord from the AC outlet, then from the server.
3. Disconnect all external peripheral devices from the server.
4. For most removal and replacement procedures, you must remove the server from the rack and place it on a sturdy table or workbench. Refer to the *Compaq ProLiant 850R Setup and Installation Guide*.

WARNING: To reduce the risk of personal injury or damage to the server, you must support the server when loading or unloading it from the rack. The ProLiant 850R 6/200N and the ProLiant 850R 6/200H is not attached to the support rails of the rack and may fall if not supported when extended from the rack.

WARNING: Because the rack allows you to stack computer components on a vertical rather than horizontal plane, you must take precautions to provide for rack stability and safety. It is important that you follow these precautions to provide for rack stability and safety, and to protect both personnel and property. Heed all cautions and warnings throughout the installation instructions that came with the server.

CAUTION: Electrostatic discharge can damage electronic components. Be sure you are properly grounded before beginning any installation procedure. See the section titled “Electrostatic Discharge” for more information.

Rack Warnings

WARNING: Always load the heaviest item first and load the rack from the bottom up. This makes the rack "bottom-heavy" and helps prevent the rack from becoming unstable.

WARNING: To reduce the risk of personal injury, fire, or damage to the equipment, do not overload the AC supply branch circuit that provides power to the rack.

WARNING: To reduce the risk of personal injury or damage to the equipment, the bottom stabilizers on the equipment must be fully extended. Be sure that the equipment is properly supported/braced when installing options and cards.

WARNING: To reduce the risk of personal injury or damage to the equipment, at least two people are needed to safely unload the rack from the pallet. An empty 42U rack weighs 253 lb (115 kg), is over seven ft (2.1m) tall, and may become unstable when being moved on its casters. Do not stand in front of the rack as it rolls down the ramp from the pallet; handle it from the sides.

WARNING: A rack may become unstable if more than one component is extended for any reason. To reduce the risk of personal injury, be sure that the rack is adequately stabilized before extending a component outside the rack, and extend only one component at a time.

WARNING: Before beginning to work on the rack, be sure that the leveling jacks are extended to the floor, that the full weight of the rack rests on the level floor, and that either stabilizers are installed or multiple racks are coupled for stability.

Server Warnings and Precautions

WARNING: To reduce the risk of personal injury or damage to the server, you must support the server when loading or unloading it from the rack. The ProLian 850R is not attached to the support rails of the rack and may fall if not supporte when extended from the rack.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

WARNING: This equipment is designed for connection to a grounded AC outlet. The grounding type plug is an important safety feature. To reduce the risk of electric shock or damage to your equipment, do not disable this feature.

WARNING: Be sure that the power outlet into which you plug your power cord is easily accessible and located as close to the equipment operator as possible. When you need to disconnect power to the equipment, be sure to unplug the power cord from the power outlet.

CAUTION: Be sure that the voltage select switch is in the proper position (115 VAC or 230 VAC). Failure to do so will result in damage to your equipment.

CAUTION: Protect the server from power fluctuations and temporary interruptions with a regulating uninterruptible power supply (UPS). This device protects the hardware from damage caused by power surges and voltage spikes and keeps the system in operation during a power failure.

CAUTION: The Compaq ProLiant 850R Servers must always be operated with system unit covers on. Proper cooling will not be achieved if the system unit covers are removed.

Server Cover

Remove the server cover to gain access to drive bays, expansion slots, and switches inside the server.

To remove the server cover, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Loosen the two thumbscrews at the rear of the unit.
3. Slide the cover toward the rear of the unit about 1 inch (2.5 cm), and lift off the cover.

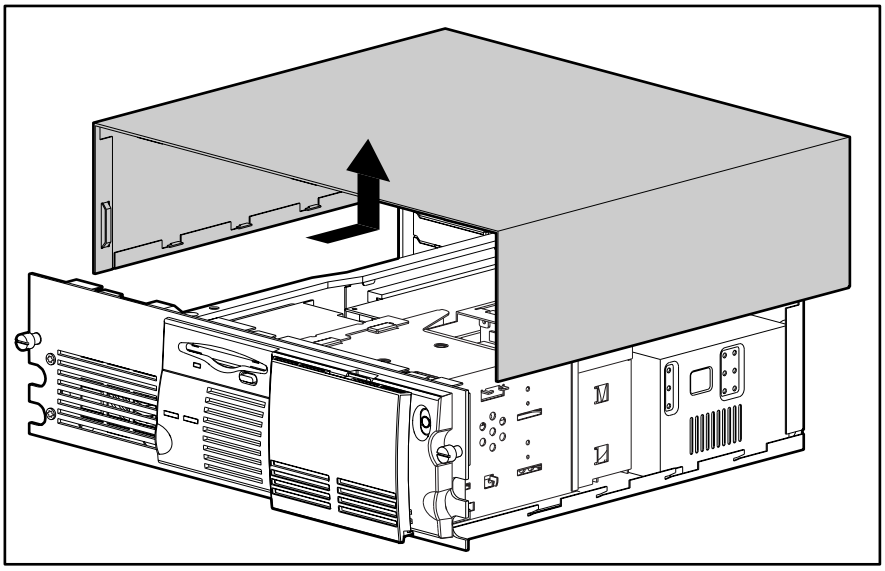

Figure 2-1. Removing the Server Cover

Reverse steps 1 through 3 to replace the server cover.

Front Bezel

Remove the front bezel to gain access to drive bays, removable media bays, and the power switch.

To remove the front bezel, complete the following steps:

WARNING: Before removing the front bezel, be sure that the computer is turned off and that the power cord is disconnected from the electrical outlet.

1. Perform the preparation procedures. See page 2-3.
2. Remove the four screws at the front left of the bezel.

NOTE: The front bezel of the ProLiant 850R 6/200N may not resemble the bezel in the following figures. It is removed using the same procedures.

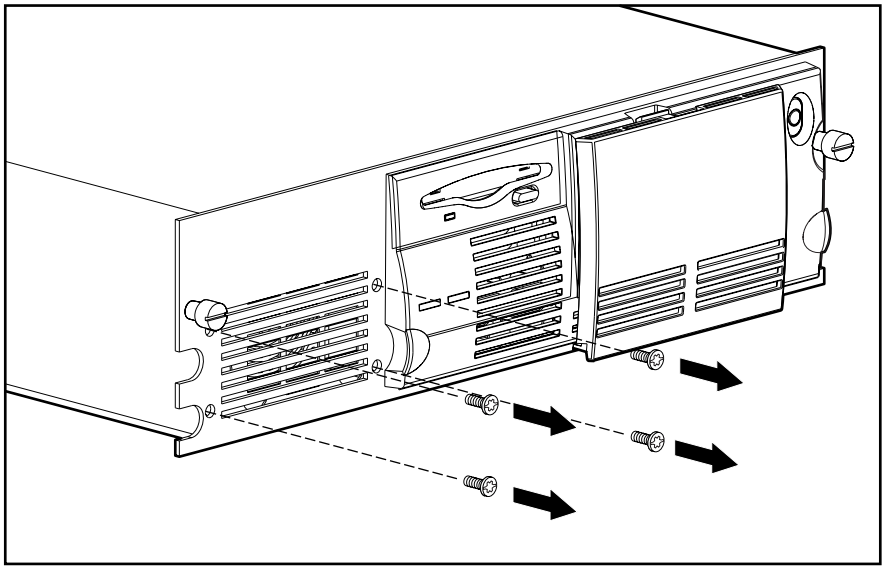

Figure 2-2. Removing the Bezel Screws

3. Pull the left side of the bezel away from the chassis about 30 degrees ❶.
4. Pull the bezel to the left to unseat it from the hinge ❷.

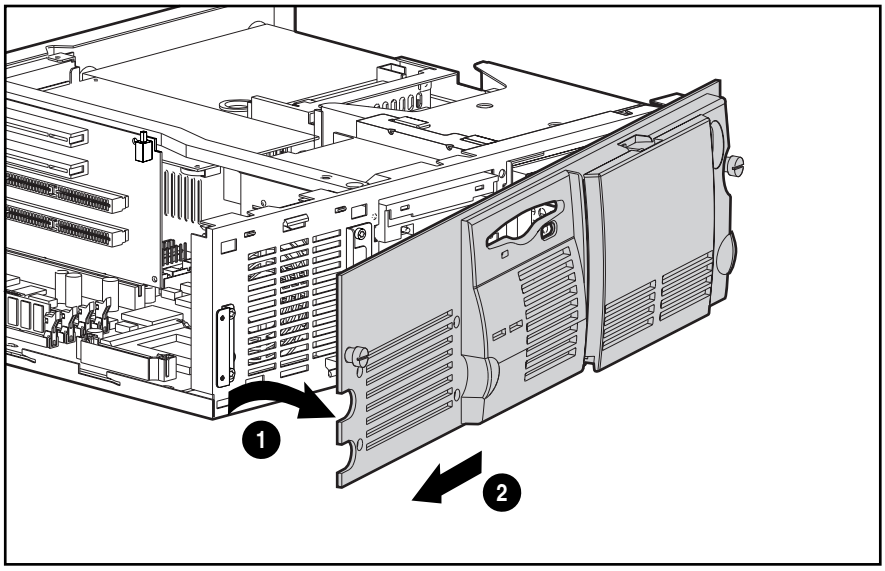

Figure 2-3. Removing the Bezel

Reverse steps 1 through 4 to replace the front bezel.

Power Switch

The server ships with the power switch security feature in the locked position. This protects the server from being shut down due to incidental contact with the power switch cover. To turn the server ON or OFF, you must use a thin object to depress the center circle of the power switch cover. The eraser end of a pencil works well.

Disabling the Power Switch Security Feature

The entire switch assembly can be depressed with your finger; it does not require the use of a pencil. This change disables the security feature.

To disable the power switch security feature, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the front bezel. See page 2-7.
3. Use a narrow instrument to press the top clip ❶ and the bottom clip ❷ that secure the switch in the front bezel.
4. Remove the switch parts from the bezel ❸.

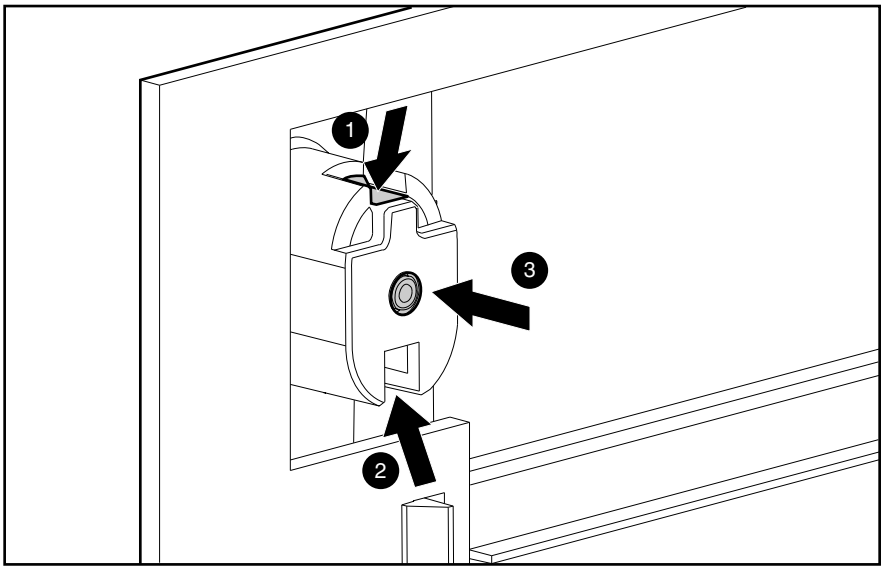

Figure 2-4. Removing the Power Switch from the Front Bezel

5. Rotate the switch assembly 180 degrees ❶.
6. Insert the switch into the front bezel ❷. Be sure that you include the spring and that clips on the switch engage the front bezel.

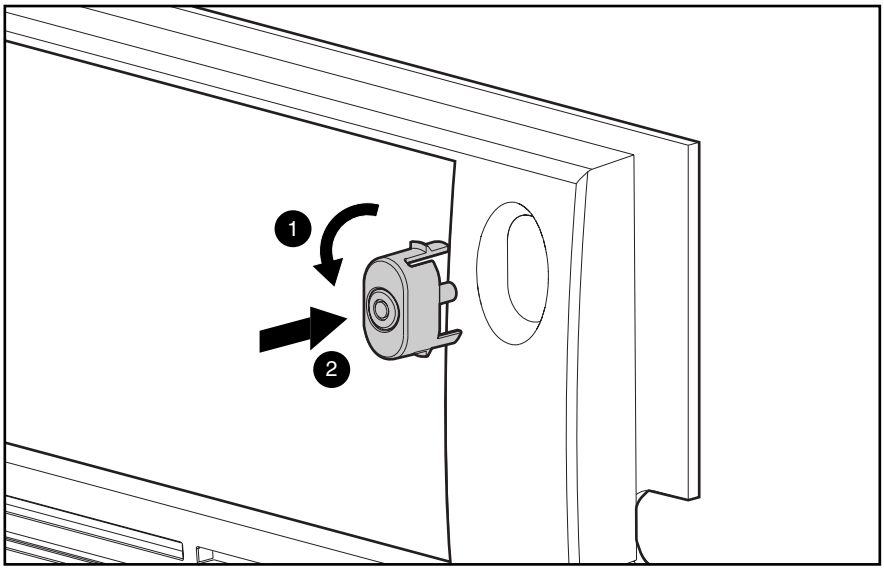

Figure 2-5. Inserting the Power Switch into the Front Bezel

Removing the Power Switch

To remove the power switch, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Disconnect the power switch cables from the switch.
4. Lift the tab on the bottom of the switch.
5. Push the switch down and pull it out.

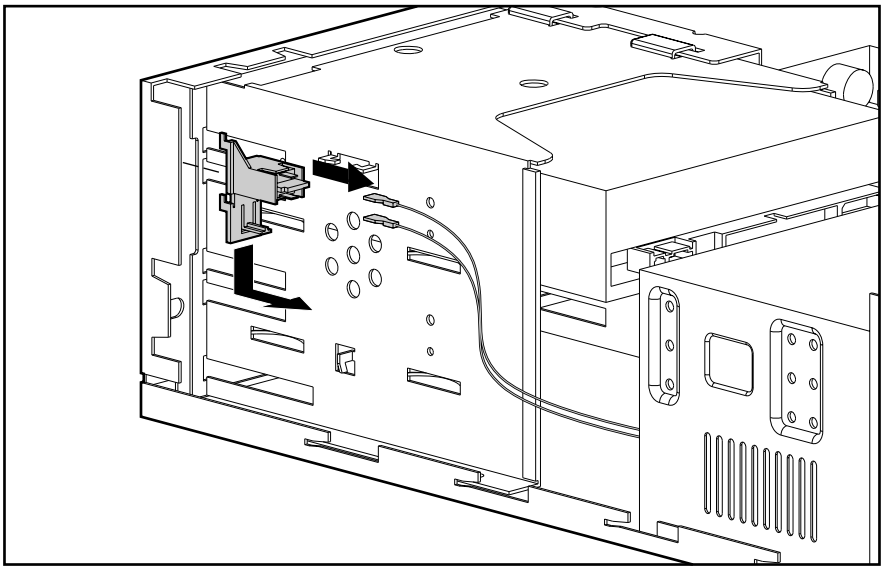

Figure 2-6. Removing the Power Switch

Reverse steps 1 through 5 to replace the power switch.

Fan with Cable

To remove the fan, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Unplug the fan from the system board.
4. Press the top retention tab on the fan assembly. Push the top of the fan from the exterior of the server, then pull the fan up and out.

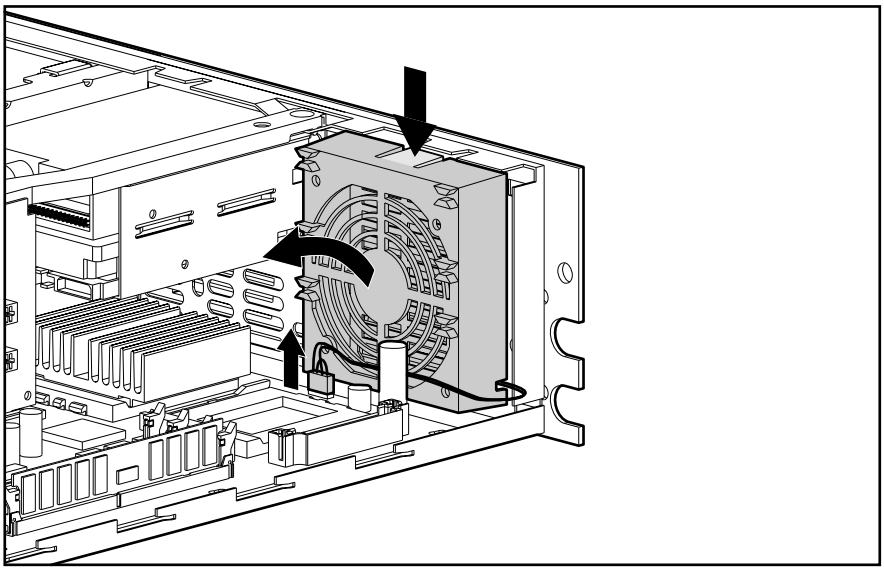

Figure 2-7. Removing the Fan

Reverse steps 1 through 4 to replace the fan.

Hot-Plug Fan and Bracket

The hot-plug fan ships with the ProLiant 850R 6/200H only. To remove the hot-plug fan, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Disconnect the data and power cables connected to the CD-ROM paddle board (if installed) and the hot-plug SCSI backplane board.
4. Unplug the fan from the power supply.
5. Remove the drive cage. See page 2-16.
6. Remove the four T-15 screws connecting the fan and bracket to the back of the drive cage.
7. Pull the fan and bracket away from the drive cage.

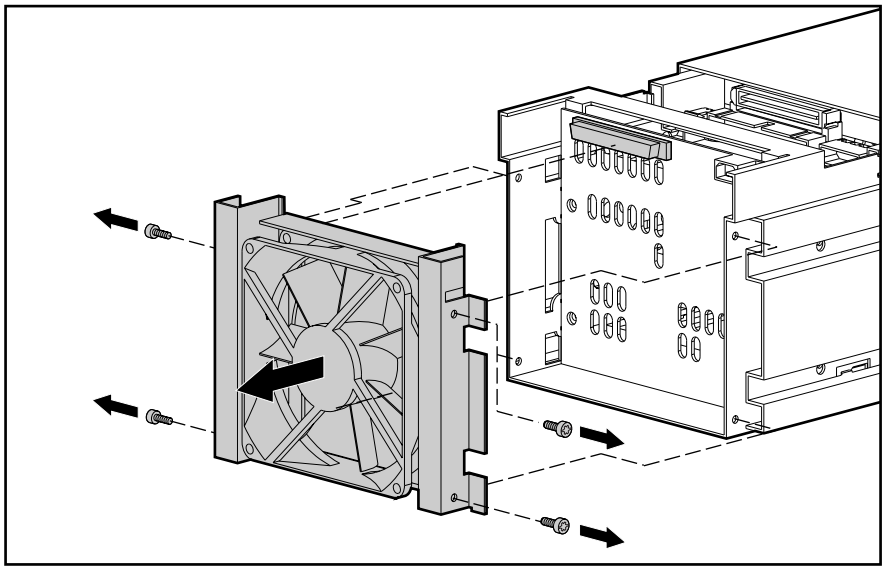

Figure 2-8. Removing the Hot-Plug Fan

Reverse steps 1 through 7 to replace the hot-plug fan and bracket.

Mass Storage Devices

Mass storage varies slightly for the Compaq ProLiant 850R 6/200H and the Compaq ProLiant 850R 6/200N models. Refer to Drive Installation Guidelines below, and instructions for your specific model.

Drive Installation Guidelines

When adding SCSI hard drives to the Compaq ProLiant 850R Servers, observe the following guidelines:

- A maximum of seven SCSI devices per controller may be added.
- Each SCSI drive must have a unique address.
- SCSI addresses (or IDs) are automatically determined for drives installed in the hot-plug drive bays of the ProLiant 850R 6/200H. See Table 2-2.
- Compaq non hot-plug drive SCSI cables for the ProLiant 850R 6/200N servers are terminated. Remove all terminating jumpers from third-party SCSI devices.
- The hot-plug SCSI backplane board provides proper termination for SCSI devices installed in hot-plug bays.
- Supported Compaq SCSI options are not terminated.

The following chart provides the SCSI ID jumper settings for Compaq SCSI hard drives.

Table 2-1
SCSI ID Settings

SCSI ID	Bit 2	Bit 1	Bit 0
6	ON	ON	OFF
5	ON	OFF	ON
4	ON	OFF	OFF
3	OFF	ON	ON
2	OFF	ON	OFF
1	OFF	OFF	ON
0	OFF	OFF	OFF

Compaq ProLiant 850R 6/200H

This section describes the drive bay locations, removal and replacement procedures, and hard drive installation for parts unique to the Compaq ProLiant 850R 6/200H Server.

Drive Bays

The ProLiant 850R 6/200H Server has five bays for internal mass storage devices. SCSI devices can be installed in drive bays 0, 2, 3, or 4 or attached to the external Fast-Wide SCSI-2 port via an external storage system.

CAUTION: The ProLiant 850R 6/200H does not support the installation of IDE or EIDE fixed disk drives.

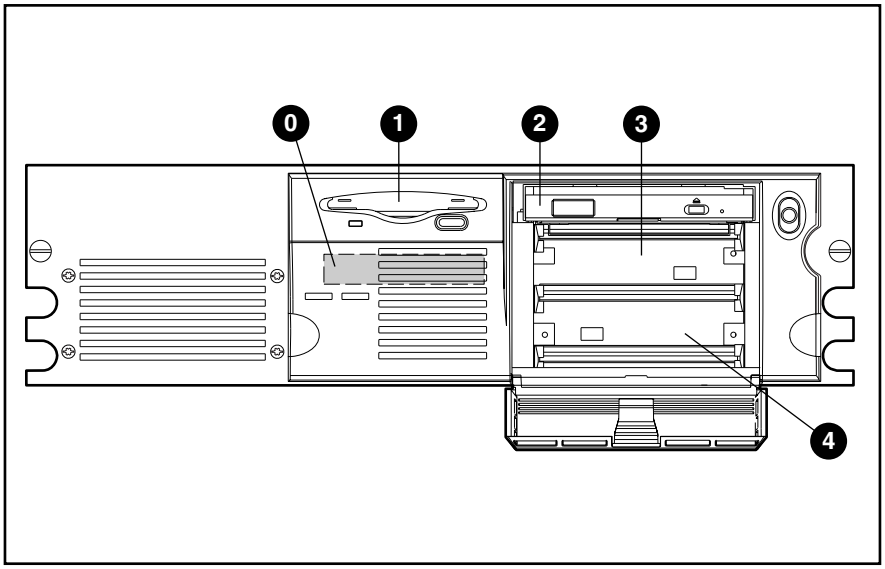

Figure 2-9. ProLiant 850R 6/200H Server Drive Bay Positions

Table 2-2
ProLiant 850R 6/200H Description of Drive Bays

Drive Bay	Configuration	SCSI IDs
0	3.5-inch x 1-inch non-hot-plug hard drive bay*	
1	3.5-inch 1.44 MB standard diskette drive	
2	1-inch drive bay occupied by a removable low-profile CD-ROM drive or a 1-inch Compaq hot-plug hard drive	2
3	1-inch drive bay accepts a 1-inch Compaq hot-plug hard drive	1
4	1-inch drive bay accepts a 1-inch Compaq hot-plug hard drive	0

* Using a 3.5-inch wide x 1-inch height non hot-plug hard drive in bay 0 requires using an additional SCSI controller and cable option PN 167227-B21.

Hot-Plug Drive Cage

To remove the hot-plug drive cage, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Disconnect the SCSI cable and power cable from the hot-plug drive backplane board. If the low-profile CD-ROM is installed, disconnect the IDE cable and power cable connected to the low-profile CD-ROM drive paddle board.
5. Remove the screws securing the drive cage to the chassis.
6. Pull the drive cage from the server.

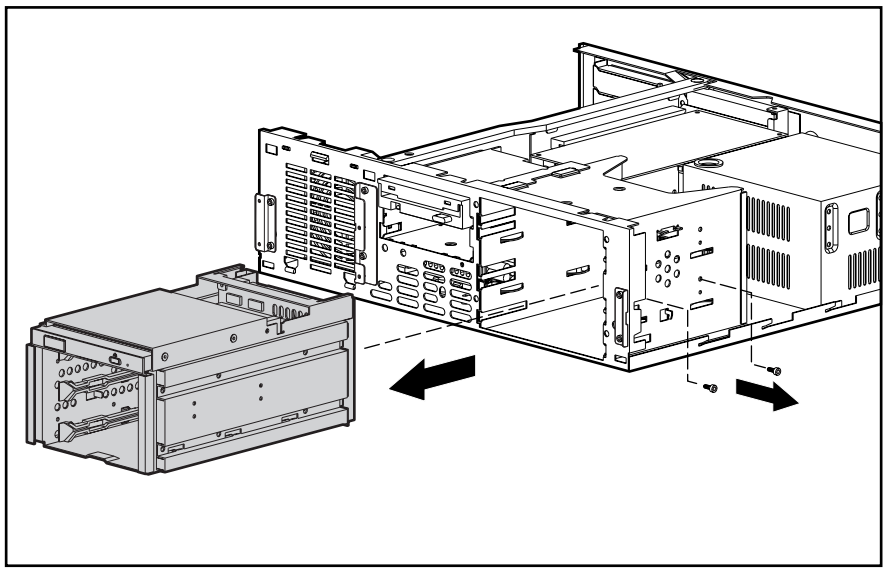

Figure 2-10. Removing the Hot-Plug Drive Cage

Reverse steps 1 through 6 to replace the hot-plug drive cage.

Low-Profile CD-ROM Assembly

To remove the low-profile CD-ROM assembly, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Disconnect the SCSI cable and power cable from the hot-plug drive backplane board. If the low-profile CD-ROM is installed, disconnect the IDE cable and power cable connected to the low-profile CD-ROM drive.
5. Remove the hot-plug drive cage. See page 2-16.
6. Remove the single T-15 screw and the two T-8 screws securing the CD-ROM assembly to the hot-plug drive cage.
7. Pull the low-profile CD-ROM assembly from the drive cage.

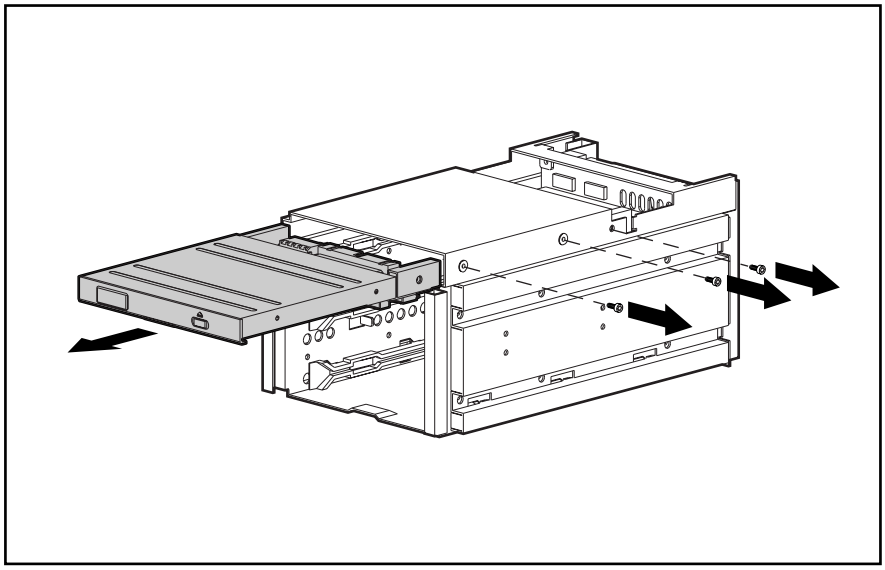

Figure 2-11. Removing the Low-Profile CD-ROM Assembly

Reverse steps 1 through 7 to replace the low-profile CD-ROM assembly.

Installing a Hot-Plug Mass Storage Device in Bay 2, 3, or 4

One-inch hard drives can be installed into bays 2, 3, and 4. However, to install a hot-plug hard drive in bay 2, the low-profile CD-ROM drive must be removed first.

To install a mass storage device in bay 2, 3, or 4, complete the following steps:

1. Open the drive bay access door.
2. Remove the low-profile CD-ROM from drive bay 2, if necessary. See page 2-17.
3. Insert the hot-plug drive.

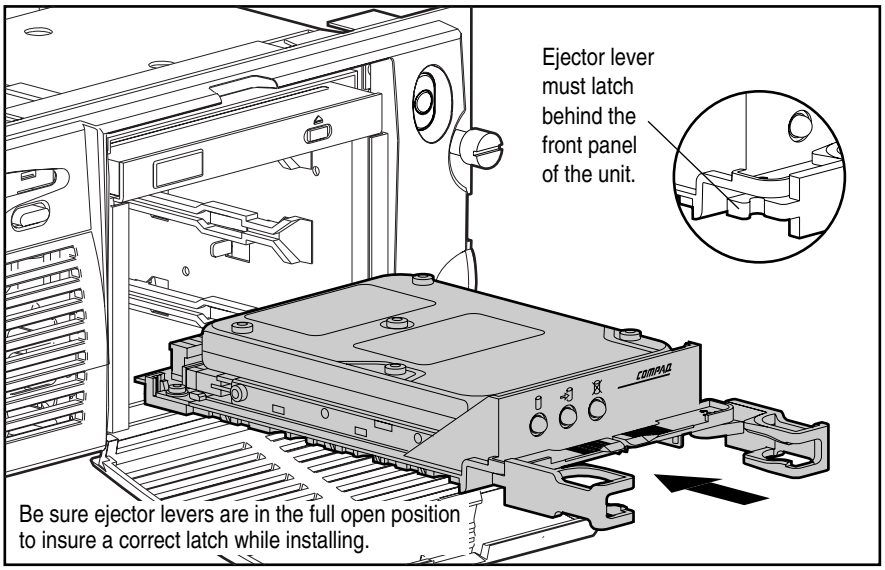

Figure 2-12. Inserting a Compaq Hot-Plug Drive in a ProLiant 850R 6/200H

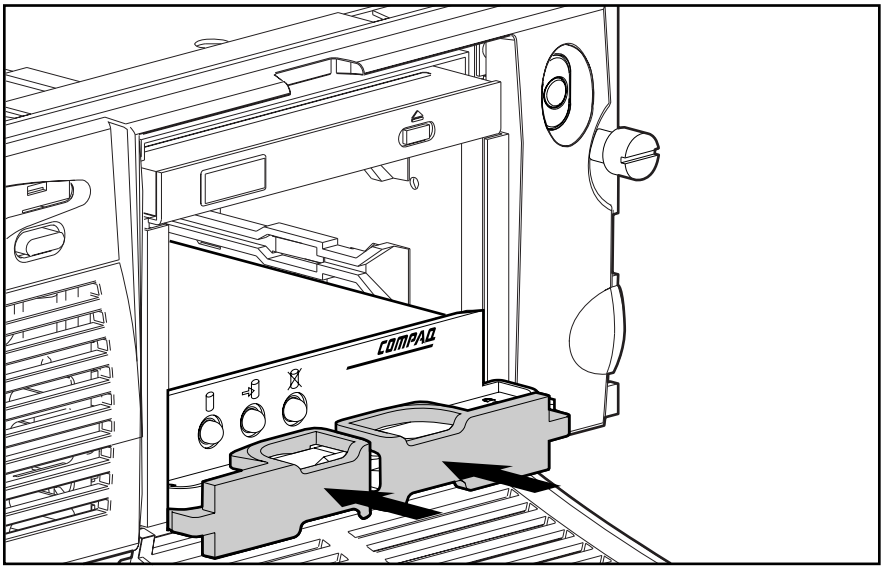

Figure 2-13. Closing Connector Levers

4. Close the connector levers.

Compaq ProLiant 850R 6/200N

This section includes the drive bay locations and installation procedures for parts unique to the Compaq ProLiant 850R 6/200N Server.

Drive Bays

The ProLiant 850R 6/200N Server has five drive bays for internal mass storage devices. SCSI devices can be installed in drive bays 0, 2, 3, or 4, or attached to the external Fast-Wide SCSI-2 port via an external storage system. SCSI hard drives are supported either inside the server or in an external storage system, but not both.

CAUTION: The ProLiant 850R 6/200N does not support the installation of IDE or EIDE fixed disk drives.

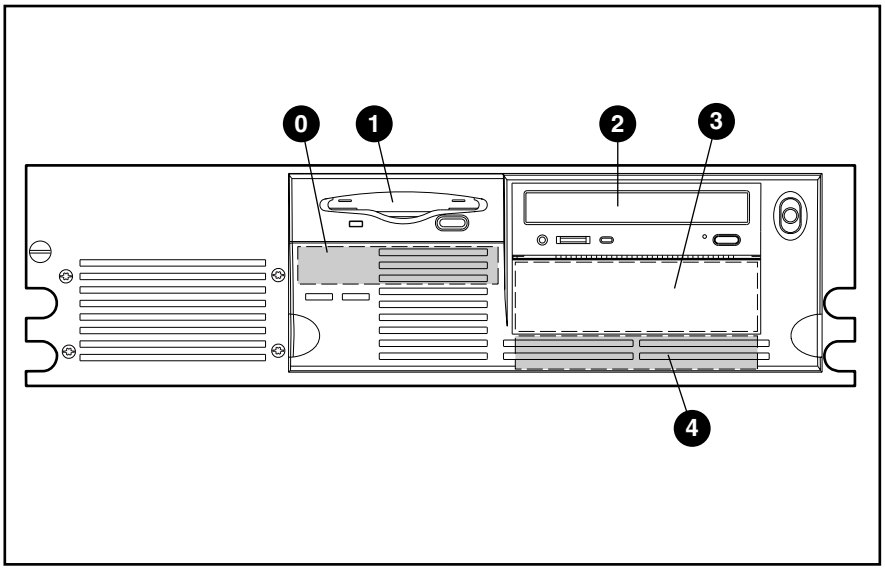

Figure 2-14. ProLiant 850R 6/200N Server Drive Bay Positions

Table 2-3
Description of ProLiant 850R 6/200N Drive Bays

Drive Bay	Configuration
0	3.5-inch x 1-inch
1	3.5-inch 1.44 MB standard diskette drive
2	5.25-inch x 1.6-inch hot-plug drive bay occupied by a standard 8X IDE CD-ROM drive (removable media area)
3	5.25-inch x 1.6-inch (removable media area)
4	5.25-inch x 1-inch

You can install hard drives into drive bays 0, 2, 3, and 4; however, positions 2 and 3 are more often used for devices requiring user access. You can install either a 1.6-inch or a 1-inch drive into a 1.6-inch drive bay.

Installing a Tape Drive or CD-ROM Drive in Bay 3

To install a tape drive or CD-ROM drive in drive bay 3 in the Compaq ProLiant 850R 6/200N, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Insert one of three black screws (shipped with the server in the miscellaneous hardware kit) into the front left mounting hole on the drive.
5. Insert the drive into drive bay 3.
6. Insert and tighten the two screws securing the drive in the drive cage.

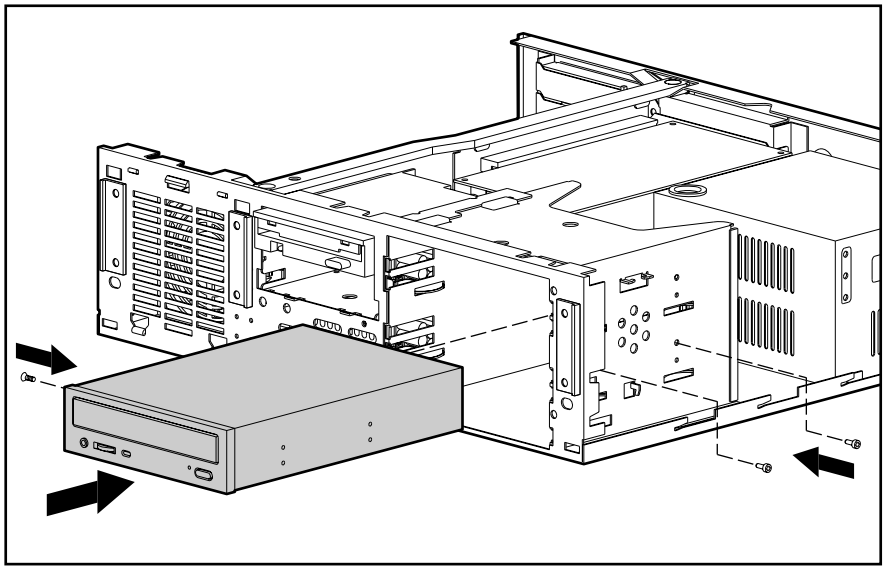

Figure 2-15. Installing a CD-ROM Drive into Bay 3 in a ProLiant 850R 6/200N

7. Attach the IDE and power cables to the CD-ROM drive.
8. Remove the blank drive bezel from the inside of the front bezel.
9. Replace the front bezel and server cover.

3.5-Inch Drive into a 5.25-Inch Drive Bay

To install a 3.5-inch drive into a 5.25-inch drive bay in the Compaq ProLiant 850R 6/200N, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Attach the 3.5-inch drive to the 5.25-inch bracket with the screws provided in your kit.

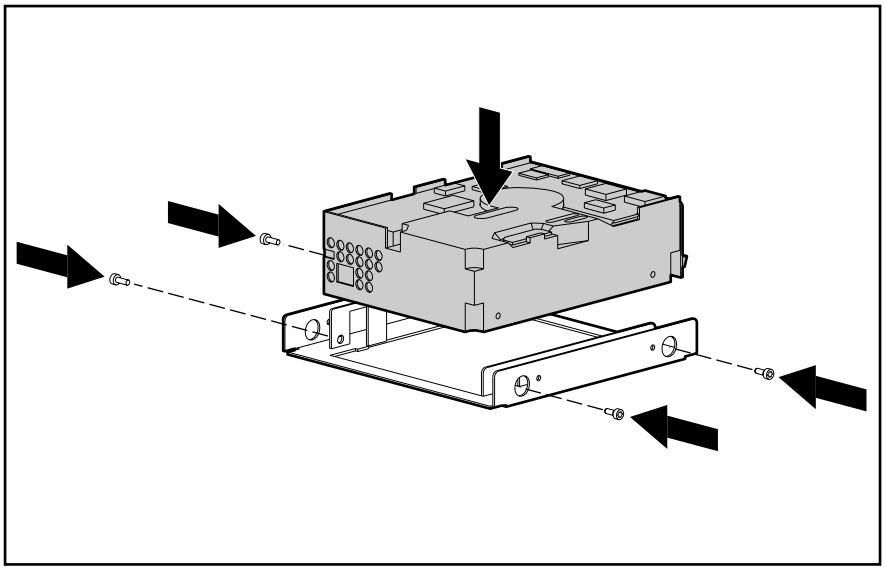

Figure 2-16. Attaching a 3.5-Inch Drive to a 5.25-Inch Bracket

5. Install one black, wafer-head guide screw provided with the unit into the front screw hole on the left side of the bracket.

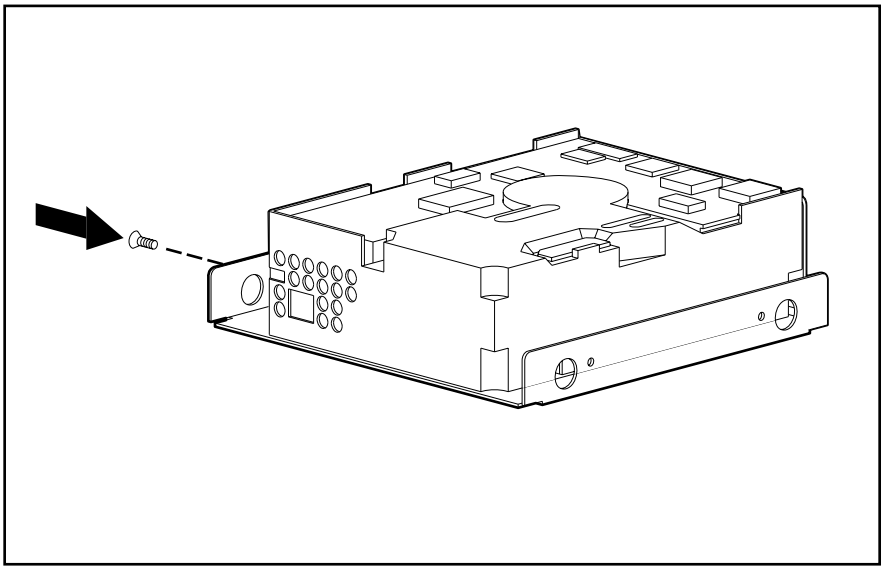

Figure 2-17. Installing the Guide Screws in the Drive Bracket

6. Install the bracket and drive into the drive bay. Secure the bracket with two screws through the right side of the drive cage. Be sure the guide screws line up with the guide slot in the drive cage.

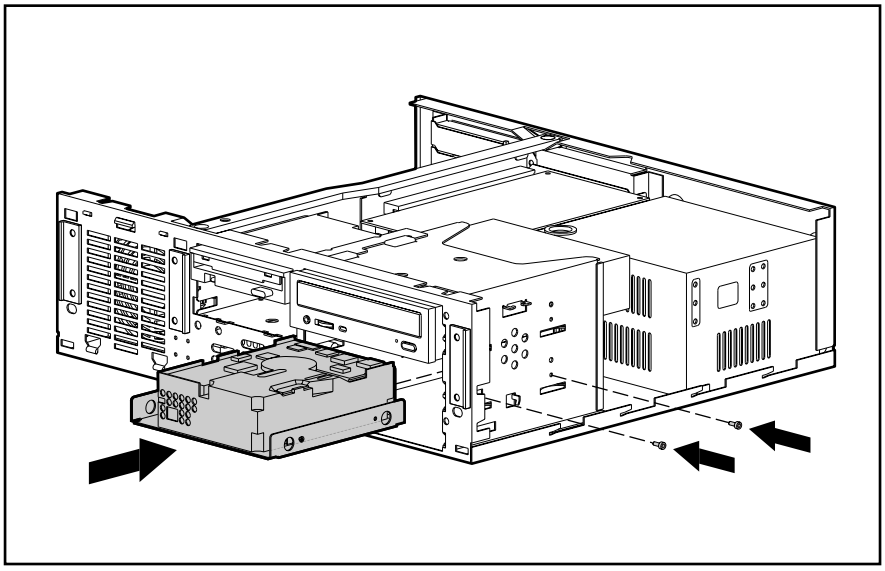

Figure 2-18. Installing and Securing the Drive into the Chassis on a ProLiant 850R 6/200N

7. Connect the drive power and signal cables.

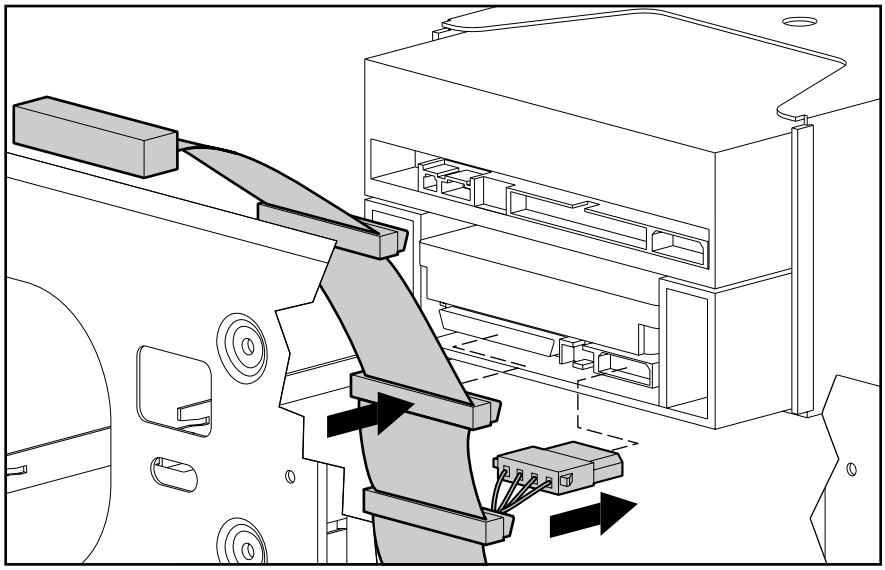

Figure 2-19. Connecting the Drive Cables

8. Remove the blank drive bezel from the inside of the front bezel, if necessary, or leave it when adding a hard drive.

9. Replace the front bezel and server cover.

Installing a Hard Drive in Bay 0

Bay 0 supports a 1-inch height hard drive. To install a hard drive in bay 0, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Install two silver, wafer-head screws into the front mounting holes on the hard drive.
5. Insert the drive in the drive cage under the diskette drive, sliding the guide screws into the mounting slots.
6. Secure the drive with an additional screw through the side of the drive cage.
7. Attach the power and internal SCSI cables to the drive.

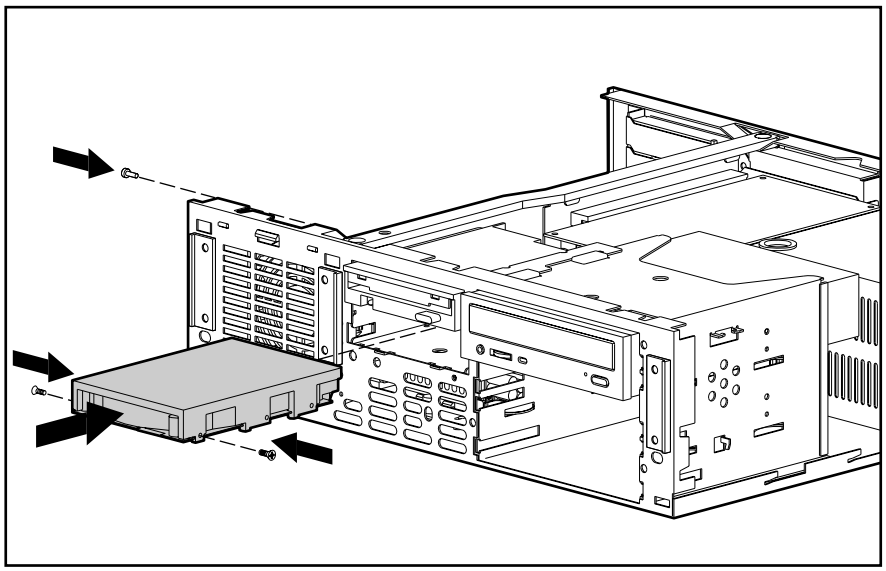

Figure 2-20. Installing a Hard Drive in Bay 0 in a ProLiant 850R 6/200N

Diskette Drive Cage

To remove the diskette drive cage, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Remove the feature board. See page 2-32.
5. Disconnect the diskette and hard drive power and data cables (if installed).
6. Remove the diskette drive and hard drive from the drive cage (if installed).
7. Remove the two front screws connecting the drive cage to the chassis.
8. Pull the drive cage back and lift it from the server.

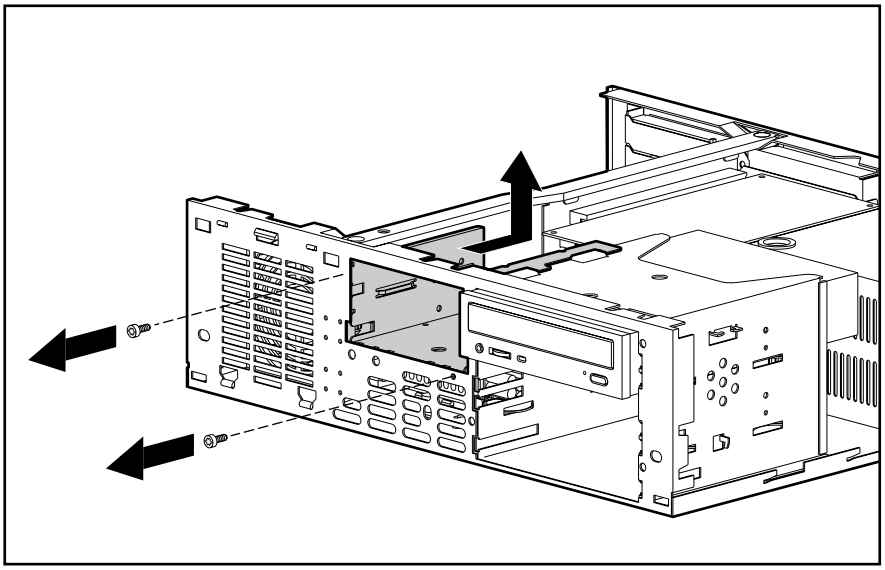

Figure 2-21. Removing the Diskette Drive Cage

Reverse steps 1 through 8 to replace the diskette drive cage.

External Storage Devices

You can connect optional mass storage devices to the Compaq ProLiant 850R by using the external Fast-Wide SCSI-2 port on the back of the unit.

Cable Routing Diagrams

CAUTION: When routing cables, always make sure that the cables are not in a position where they will be pinched or crimped.

Diskette Drive Cable

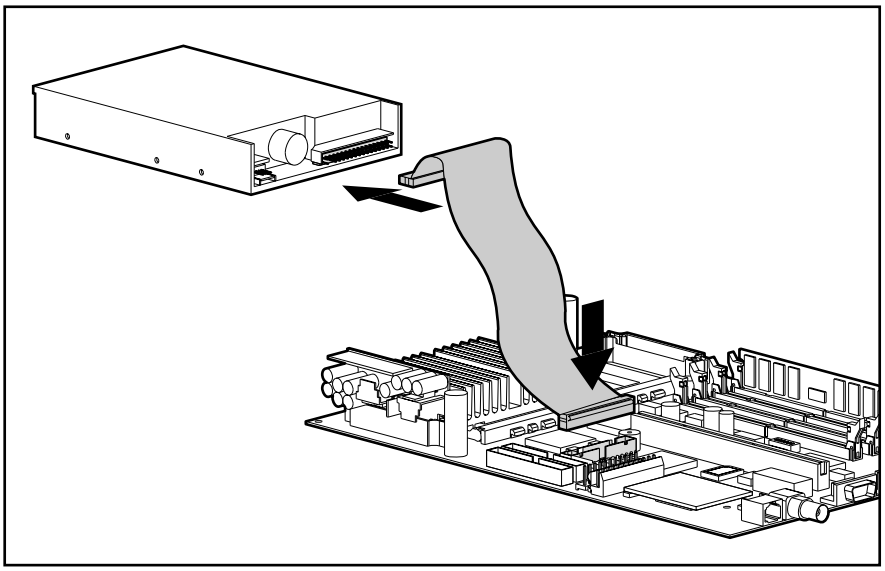

Figure 2-22. Diskette Drive Cable Diagram (Spares Part Number 298856-001)

CD-ROM Cable (ProLiant 850R 6/200N only)

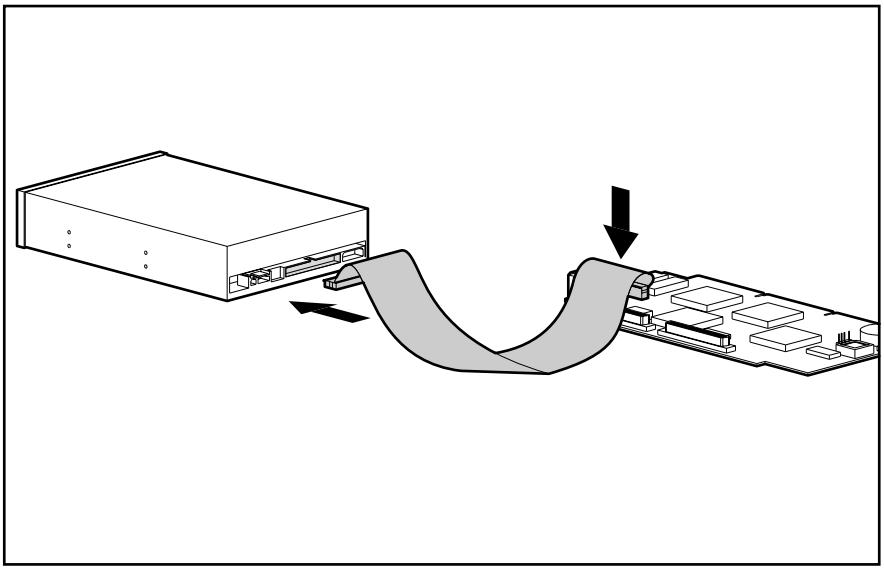

Figure 2-23. CD-ROM Cable Diagram (Spares Part Number 298848-001)

Low-Profile CD-ROM Cable (ProLiant 850R 6/200H only)

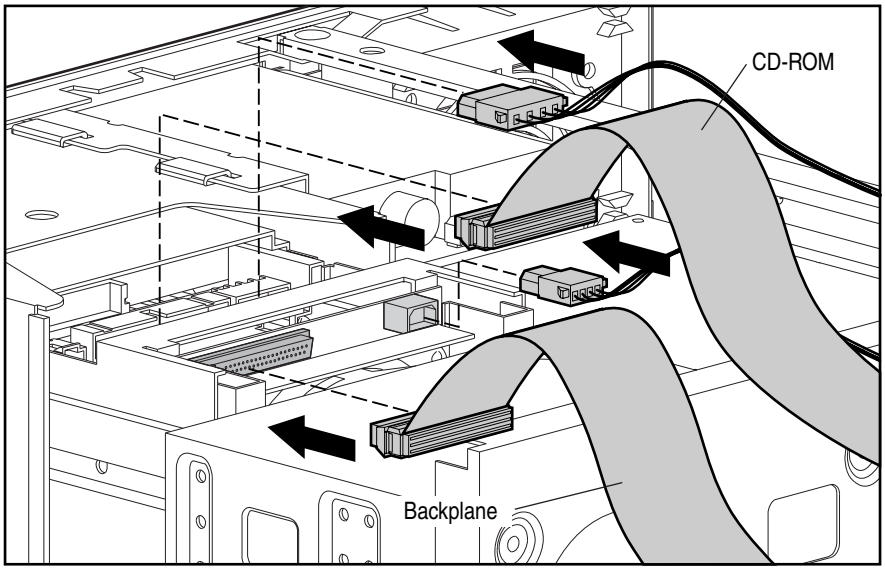

Figure 2-24. Low-Profile CD-ROM Cable Diagram (Spares Part Number 298864-001)

Internal SCSI Cable (ProLiant 850R 6/200N only)

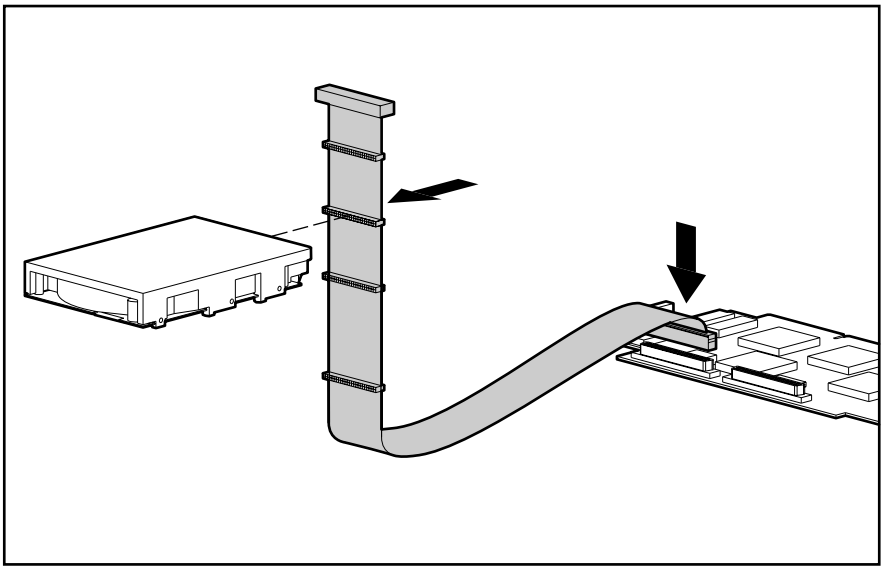

Figure 2-25. Internal SCSI Cable Diagram (Spares Part Number 298864-001)

Hot-Plug Drive Cage Cable (ProLiant 850R 6/200H only)

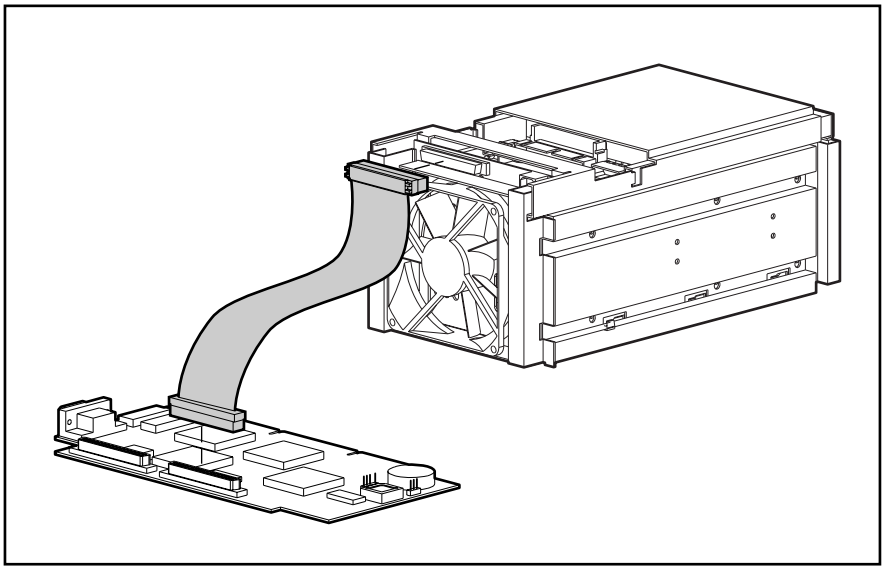

Figure 2-26. Hot-Plug Drive Cage Cable Diagram (Spares Part Number 298864-001)

Feature Board

The following procedures apply to both the Compaq ProLiant 850R 6/200H and ProLiant 850R 6/200N.

To remove the feature board, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the T-15 screw from the retaining bracket.
4. Pull the retaining bracket up from its slot ❶.
5. Pull the feature board out from the riser board ❷.
6. Disconnect the SCSI cables.

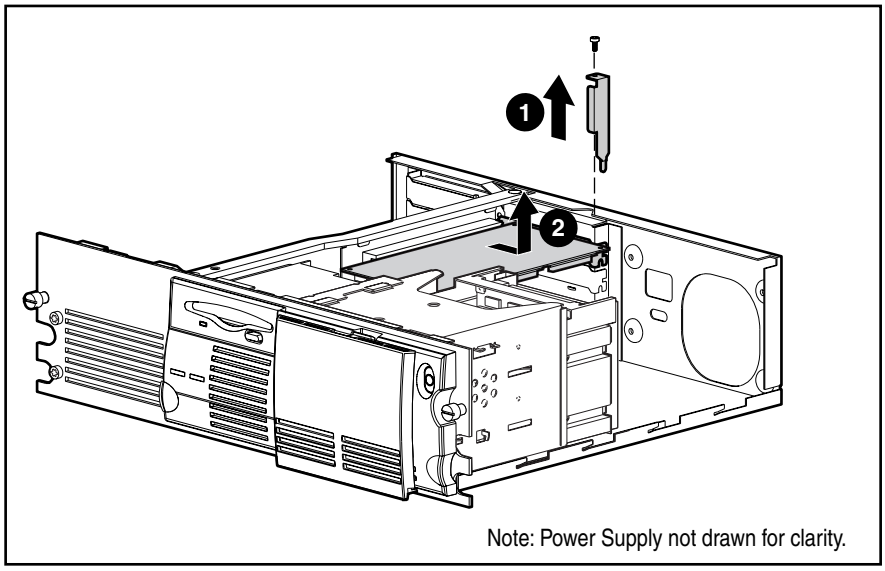

Figure 2-27. Removing the Feature Board

Reverse steps 1 through 6 to replace the feature board.

Riser Board and Brace

CAUTION: Do not remove the riser board from the riser board brace. Doing so voids all warranties for these and possibly other components.

CAUTION: When removing the feature board from the riser board, disconnecting the replacement battery causes configuration data to be lost from memory. If this battery is disconnected, you must reconfigure your system at the conclusion of this procedure.

To remove the riser board and riser board brace, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove all expansion boards.
4. Remove the feature board (see page 2-32). If necessary, disconnect an external replacement battery attached to the feature board.
5. Remove the two screws securing the riser board brace.
6. Lift the riser board and brace out of the unit.

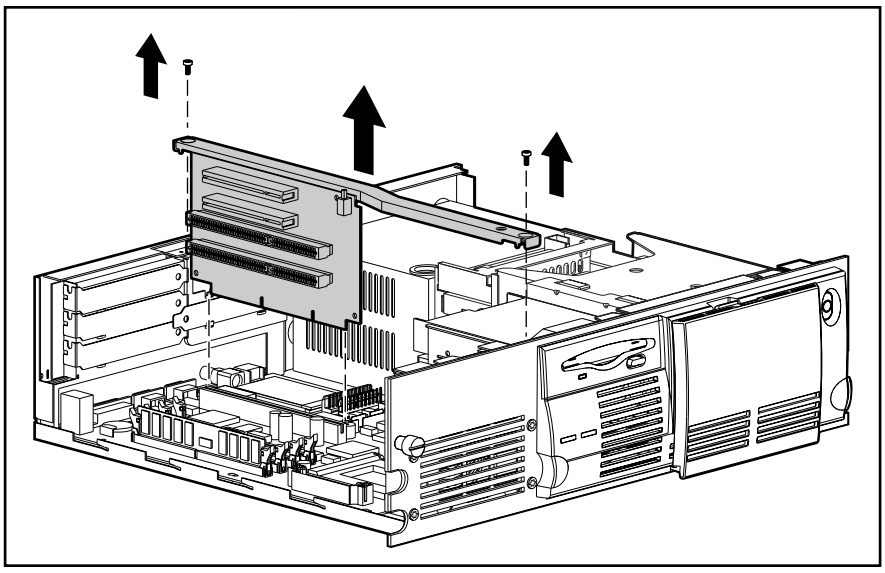

Figure 2-28. Removing the Riser Board and Riser Board Brace

Reverse steps 1 through 6 to replace the riser board and riser board brace. If you disconnected the feature board replacement battery, run the Compaq System Configuration Utility to reconfigure the system. See Chapter 3 for more information.

Memory

The Compaq ProLiant 850R requires a minimum of 32 megabytes of memory to operate. Memory can be expanded to a maximum of 512 megabytes by installing four 128-MB Dual Inline Memory Modules (DIMMs) on the system board. DIMMs do not need to be installed in pairs.

The location of the DIMM slots is shown in the following figure.

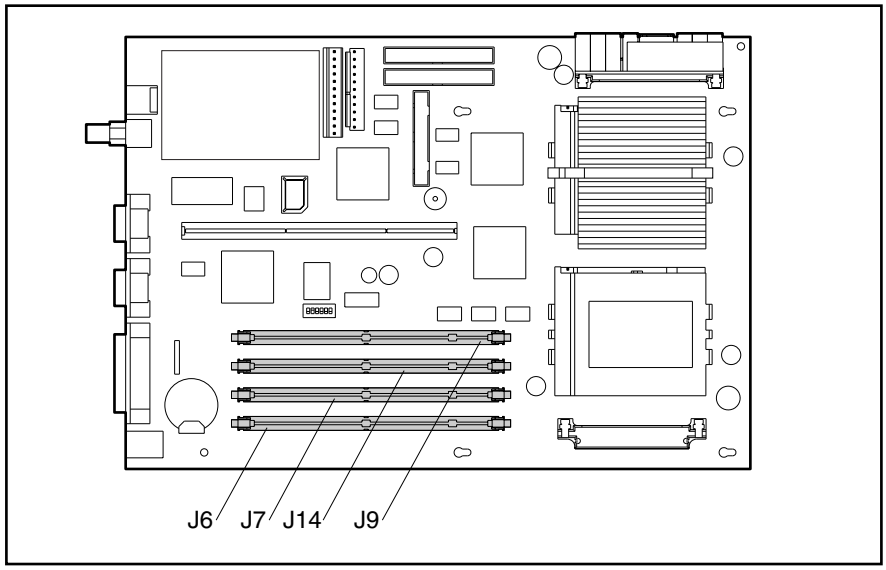

Figure 2-29. DIMM Slot Locations

To remove a DIMM, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove any expansion boards above the DIMM slot.
4. Press both DIMM slot latches outward ❶.
5. Lift out the DIMM ❷.

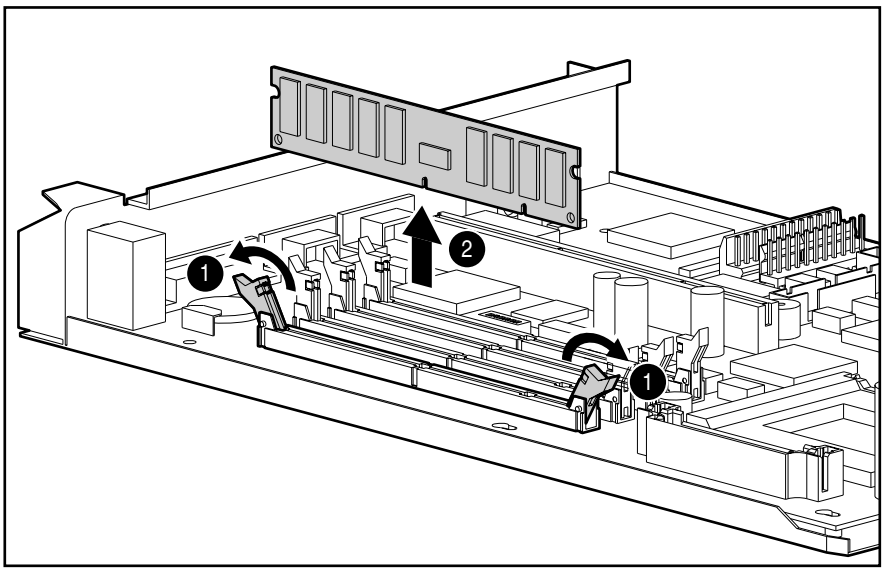

Figure 2-30. Removing a DIMM

Reverse steps 1 through 5 to replace a DIMM.

IMPORTANT: A memory module can be installed one way only. Be sure to match the *key slots* on the module with the tab on the memory slot. Push the module down into the slot, ensuring that the module is fully inserted and properly seated.

The following guidelines **MUST** be followed when installing or replacing memory:

- Use only 16-, 32-, 64-, or 128-MB, EDO, unbuffered, 72-bit wide, 4-K refreshed, 3.3-volt, ECC DIMMs. DIMMs must be 60-ns or faster. Use Compaq DIMMs only.
- A minimum of 32 megabytes must be installed to operate.
- DIMMs must all be the same speed, and rated 60 ns or faster.

NOTE: The specific DIMM bit pattern required to support error checking and correcting (ECC) memory is based on the parity scheme: one byte data, one bit parity. The data byte and parity are constructed of DRAMs that are "n" locations deep by 4-bits wide or 1-bit wide and "n" can be any number. (That is, "n" locations deep x 4-bits wide or "n" locations deep x 1-bit wide.) Use only Compaq DIMMs that conform to this parity scheme.

The recommended order of DIMM installation is:

- Second DIMM in slot 2 (DIMM slot J7)
- Third DIMM in slot 3 (DIMM slot J14)
- Fourth DIMM in slot 4 (DIMM slot J9)

Any combination of DIMMs can be used. A minimum of 32 megabytes of memory is required.

Table 2-4
Examples of DIMM Upgrade Combinations

Total Memory	Slot 1	Slot 2	Slot 3	Slot 4
32 MB	32 MB			
48 MB	32 MB	16 MB		
64 MB	64 MB			
80 MB	32 MB	32 MB	16 MB	
96 MB	64 MB	32 MB		
240 MB	32 MB	16 MB	64 MB	128 MB
256 MB	128 MB	128 MB		
256 MB	64 MB	64 MB	64 MB	64 MB
512 MB	128 MB	128 MB	128 MB	128 MB

Processor

Compaq ProLiant 850R Servers can support dual Pentium Pro, 200-MHz, 256-KB cache processors. Figure 2-31 shows the location of processors and processor power modules on the system board.

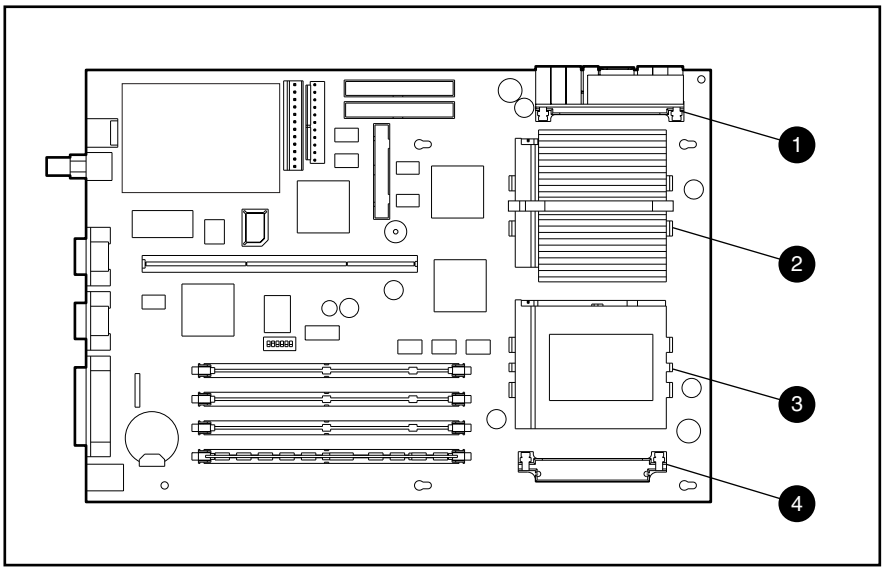

Figure 2-31. Processor and Processor Power Module Locations

Table 2-5
Processor and Processor Power Module Locations

Location	Description
❶	Processor Power Module 1 (standard shipping configuration)
❷	Intel Pentium Pro Processor (standard shipping configuration)
❸	Intel Pentium Pro Processor 2 ZIF socket
❹	Processor Power Module 2 Socket

To remove either of the processors, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.

CAUTION: When removing the feature board from the riser board, disconnecting the replacement battery causes configuration data to be lost from memory. If this battery is disconnected, you must reconfigure your system at the conclusion of this procedure.

4. Remove the feature board and any expansion boards.

5. If an external battery is installed on the feature board, disconnect it.
6. If you are removing the primary processor, remove the two screws from the diskette drive cage. Flip the cage and rest it on the rear of the chassis and the riser board support bracket. You need not move the diskette drive cage if you are removing the second processor. (See Figure 2-31 and Table 2-5.)

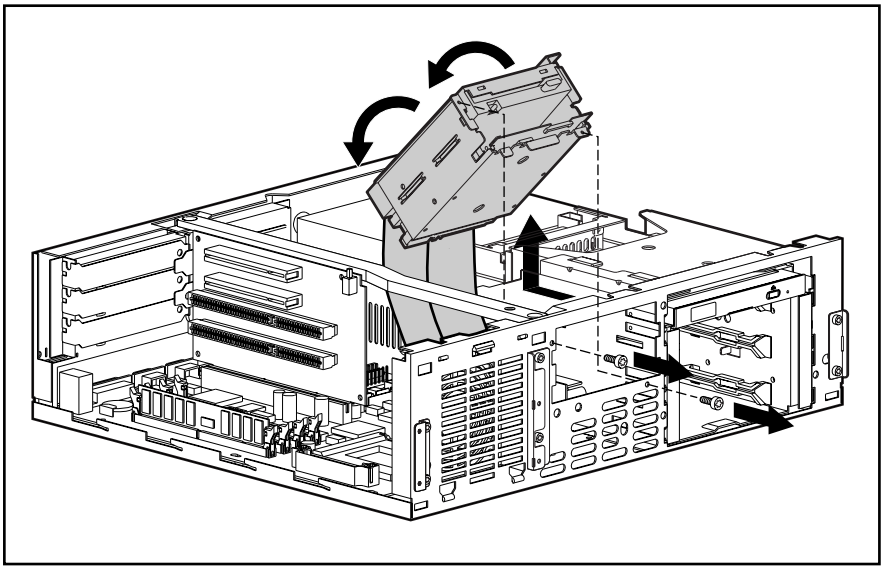

Figure 2-32. Moving the Diskette Drive Cage on a ProLiant 850R 6/200N

7. Remove the heat sink retaining clip ❶ by pressing down on the clip's extended tab until it releases from the safety catch and lifting the clip out of the way ❷.

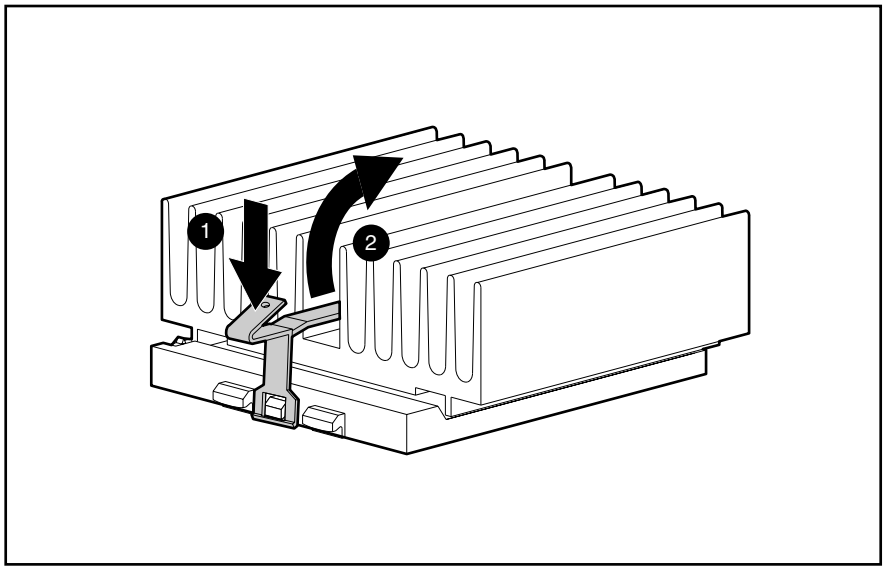

Figure 2-33. Removing the Heat Sink Clip

8. Lift the heat sink and thermal pad off the processor. The thermal pad may be stuck to the heat sink or processor. It should be removed and replaced.

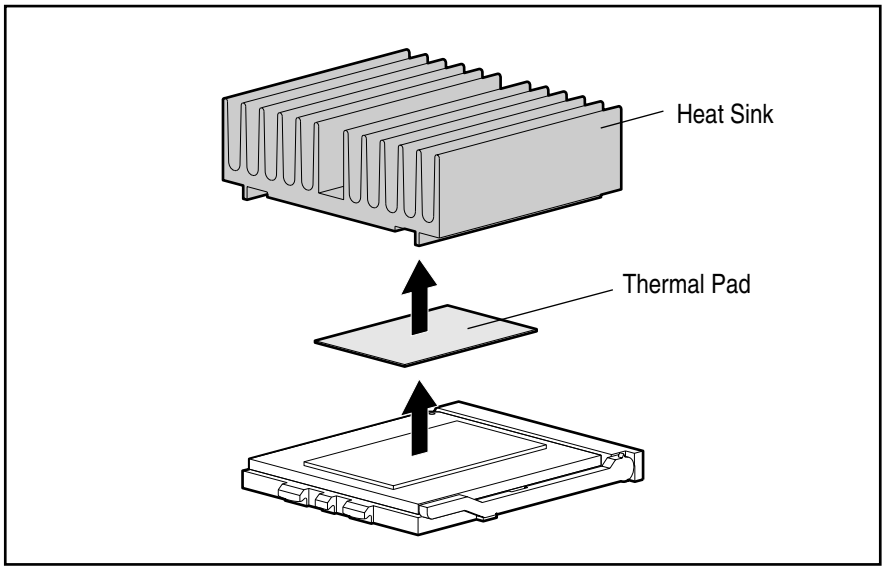

Figure 2-34. Removing the Heat Sink and Thermal Pad

9. Release the processor from the socket by pulling the handle on the ZIF socket out and upward ❶.
10. Lift the processor out of the socket ❷.

CAUTION: The handle on the ZIF socket in your server may not be identical to the handle shown in the drawing. All handle types perform the same function.

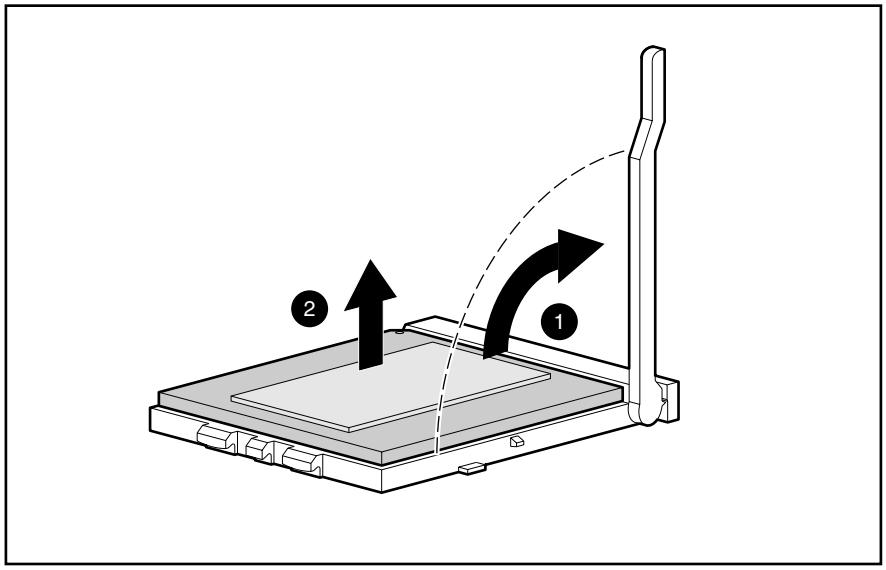

Figure 2-35. Releasing the ZIF Socket and Removing the Processor

Reverse steps 1 through 10 to replace the processor. Use the System Configuration Utility to reconfigure your system. See Chapter 3 for more information.

CAUTION: Processors on the same processor board MUST be installed in matched frequency. All processors installed in a Compaq ProLiant 850R Server must be 200 MHz.

CAUTION: When replacing the processor, the thermal pad MUST be installed or damage WILL occur to your processor.

IMPORTANT: The processor is keyed to be sure correct alignment. Align the pattern of pins in the processor with the pattern of holes in the socket. The pins and holes will not line up if the processor is turned the wrong way.

Processor Power Module

Every Pentium Pro processor comes with a processor power module (DC-to-DC converter) that provides power stability for the processor and the system board.

WARNING: To reduce the risk of personal injury from hot surfaces, allow the internal system components to cool before touching.

To remove a processor power module from socket 1, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.

CAUTION: When removing the feature board, disconnecting an external replacement battery causes configuration data to be lost from memory. If this battery is disconnected, you must reconfigure your system at the conclusion of this procedure.

4. Remove the feature board. See page 2-32.
5. Disconnect any external replacement batteries connected to the feature board.
6. Remove the two screws from the diskette drive cage. Flip the diskette drive cage and rest it on the rear of the chassis and the riser board support bracket.

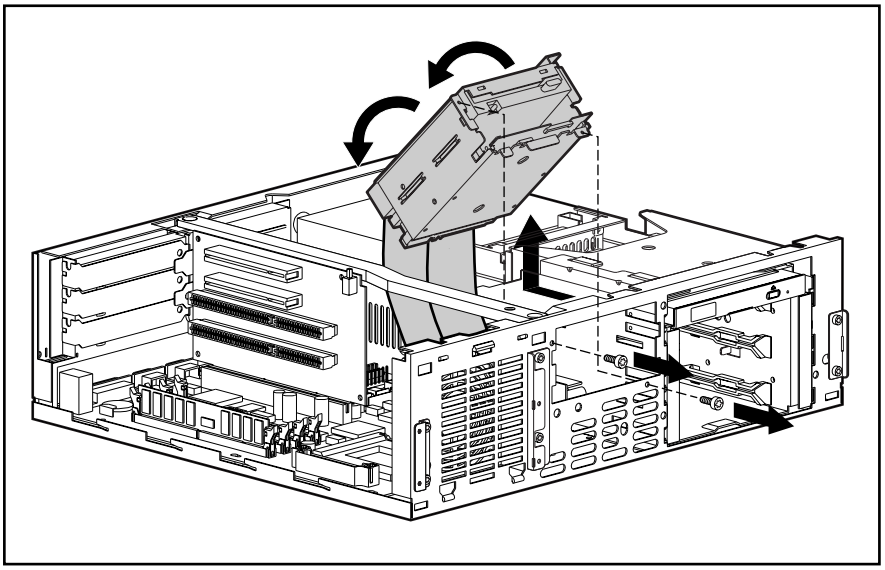

Figure 2-36. Moving the Diskette Drive Cage

7. Press the socket latches outward with your index fingers until the latches snap open.
8. As the socket latches open, the module comes out of the socket.

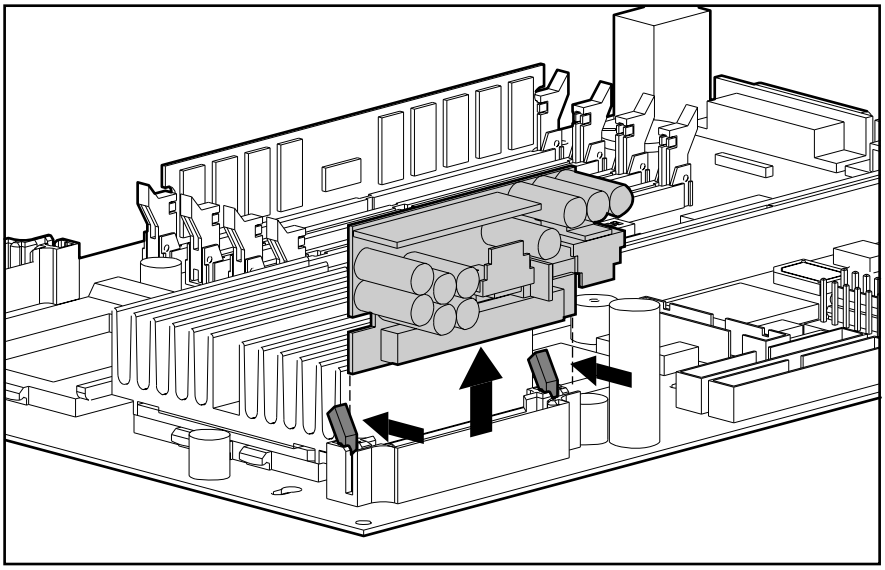

Figure 2-37. Removing a Processor Power Module

Reverse steps 1 through 8 to install a processor power module. The processor power module is keyed to ensure correct alignment. A notch in the bottom edge of the module, near the center, must align with a tab in the mounting bracket. The notch and tab will not line up if the module is turned the wrong way. Use the System Configuration Utility to reconfigure the server. See Chapter 3 for more information.

System Board

To remove the system board, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove the front bezel. See page 2-7.
4. Remove the feature board and all expansion boards. See page 2-32.
5. Remove the riser board and brace. See page 2-33.
6. Remove the diskette drive cage. See page 2-28.
7. Remove the drive cables. See page 2-29.
8. Remove the five T-15 screws mounting the system board to the chassis.

9. Remove any DIMMs. See page 2-34.
10. Remove the processor(s). See page 2-37.
11. Remove the processor power module(s). See page 2-41.
12. Remove the fan. See page 2-12.
13. Remove the five screws securing the system board.
14. Slide the system board toward the front of the unit and lift it from the chassis.

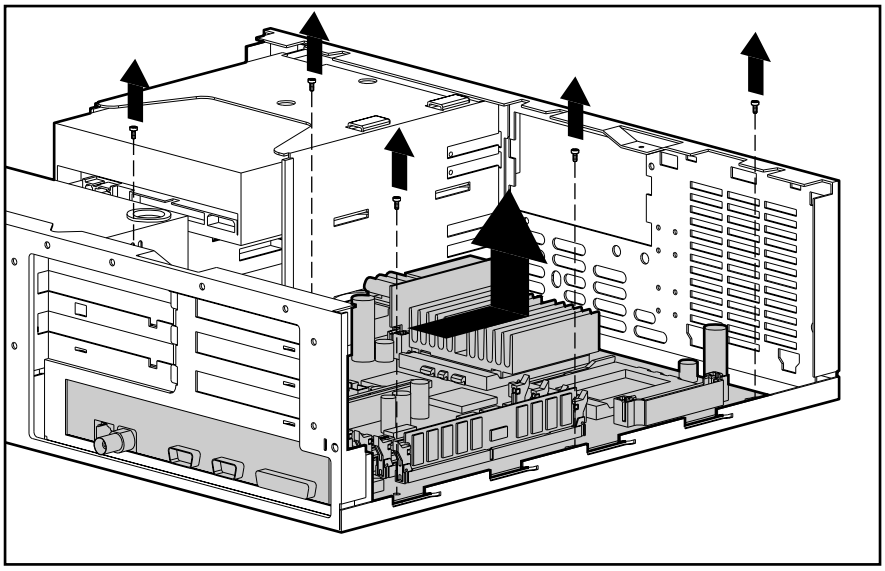

Figure 2-38. Removing the System Board

Reverse steps 1 through 14 to replace the system board.

IMPORTANT: Make sure the system board seats properly over the chassis retaining post near the drive bays.

External Replacement Batteries

The Compaq ProLiant 850R Servers contain two batteries that might require the installation of an external replacement: one on the system board and one on the feature board. Both require the same replacement battery, spares part number 160274-001.

System Board Battery

If the server no longer automatically displays the correct date and time, you may need to replace the battery that provides power to the real-time clock. Under normal use, battery life is usually about five to ten years.

WARNING: The system board contains a clock/CMOS lithium battery, which can explode if mistreated. The battery is soldered in place and can not be removed. Do not abuse or disassemble. Use only replacement batteries supplied by Compaq Computer Corporation (spare part number 160274-001).

To install an external battery on the system board, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove any expansion boards necessary to gain access to the battery header.
4. Change the jumper on header E2 from pins 6-7 to pins 5-6.

IMPORTANT: When a jumper is on header E2 / pins 6-7, the internal battery is used. When a jumper is on header E2 / pins 5-6, the external battery is used.

5. Remove the backing from the adhesive on the hook-and-loop fastener strip.
6. Place the battery and the hook-and-loop fastener strip on the designated chip, as shown in the following illustration.
7. Plug the battery connector onto pins 1-4 of header E2 on the system board.

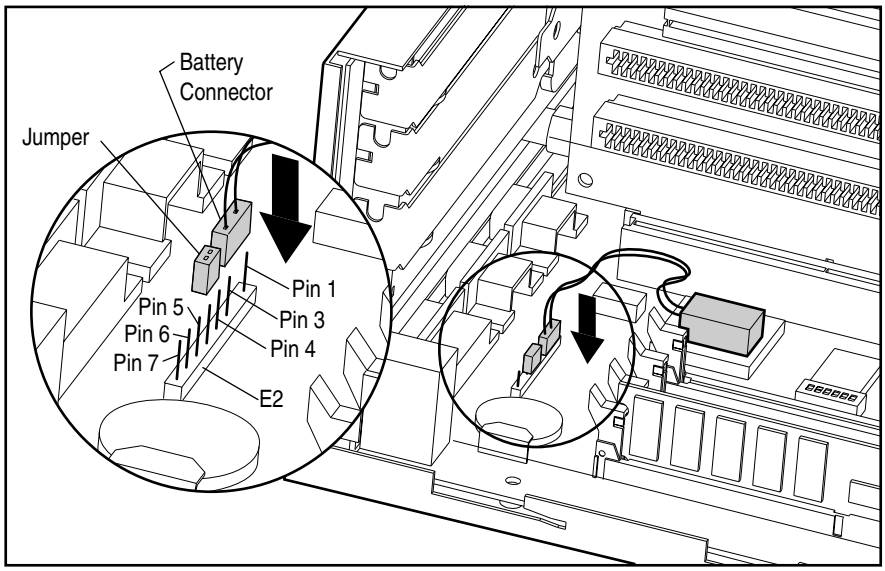

Figure 2-39. System Board Battery and Jumper

8. Place the sticker included with your battery kit on the back of your server above the power connector.
9. Run the Compaq System Configuration Utility to reconfigure the system. See Chapter 3 for more information.

Feature Board Battery

When your server displays an error of "172-1 Configuration Nonvolatile Memory Invalid," it might mean that you need to replace the battery providing power to the nonvolatile CMOS on the feature board. Battery life is usually about five to ten years under normal use. Use Compaq replacement battery spares part number 160274-001.

CAUTION: Do not attempt to remove the feature board battery. It is permanently installed.

To install the new external battery on the feature board, complete the following steps:

1. Perform the preparation procedures. See page 2-3.
2. Remove the server cover. See page 2-6.
3. Remove any boards necessary to gain access to the feature board jumper headers.
4. On the feature board, change the jumper on header E1 from pins 1-2 to pins 2-3.

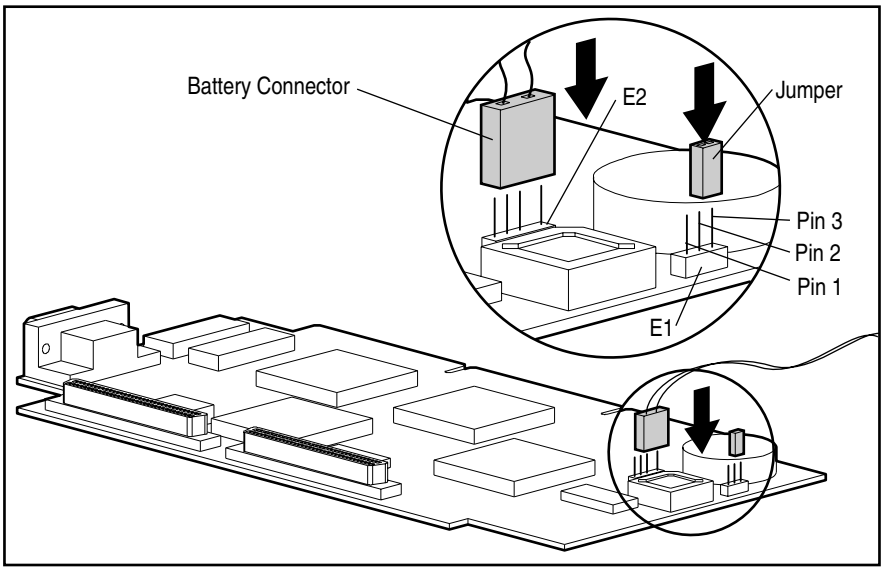

Figure 2-40. Feature Board Battery and Jumper

IMPORTANT: When the jumper is placed at header E1 on pins 1-2 on the feature board, the internal battery is used. When the jumper is placed at header E1 on pins 2-3, the external battery is used.

5. Plug the battery connector onto header E2 on the feature board.
6. Remove the backing from the adhesive on the hook-and-loop fastener strip. Place the battery and the hook-and-loop fastener strip as shown in the following illustration.

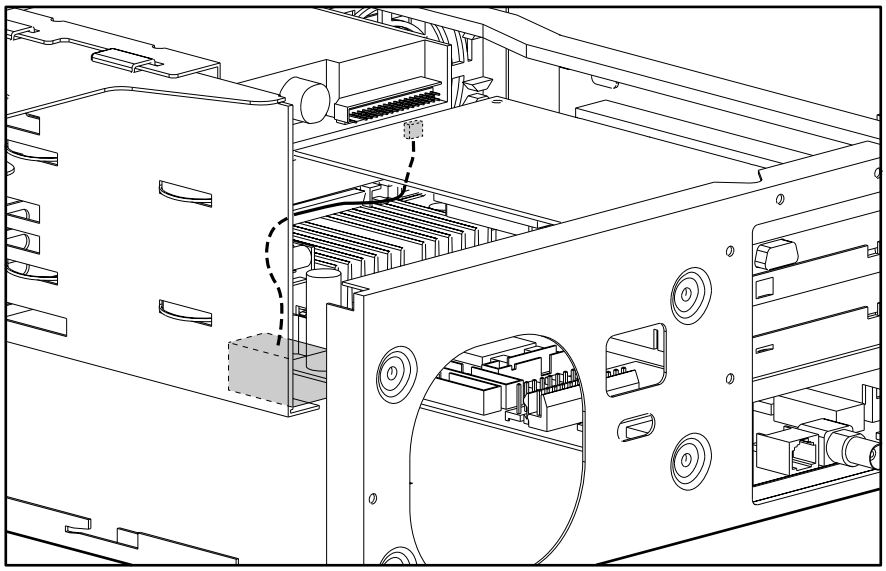

Figure 2-41. Feature Board Battery and Jumper

7. Place the sticker included with your battery kit on the back of your server above the power connector.

WARNING: To reduce the risk of electrical shock or damage to your equipment, do not disable the power cord grounding feature. This equipment is designed to be connected to a grounded (earthed) power outlet that is easily accessible to the operator. The grounding type plug is an important safety feature.

8. Run the Compaq System Configuration Utility to reconfigure the system. See Chapter 3 for more information.

Chapter 3
Diagnostic Tools

This chapter describes software and firmware diagnostic tools available for Compaq server products. These include:

- Diagnostics Software
- Drive Array Advanced Diagnostics (DAAD)
- Rapid Recovery Services
- Remote Service Features
- ROMPaq
- Compaq Insight Manager

Utility Access

The Compaq SmartStart and Support Software CD contains the SmartStart program and many of the Compaq utilities needed to maintain your system, including:

- System Configuration Utility
- Array Configuration Utility
- Drive Array Advanced Diagnostics Utility
- ROMPaq Firmware Upgrade Utilities

CAUTION: Do not select the Erase Utility when running the SmartStart and Support Software CD. This will result in data loss to the entire system.

There are several ways to access these utilities:

- **Run the Utilities on the system partition.**

  If the system was installed using SmartStart, the Compaq utilities will be available on the system partition. The system partition could also have been created during a manual system installation.

  To run the utilities on the system partition, boot the system and press **F10** when you see the following message: "Press F10 for system partition utilities." Then select the utilities from the menu.

  - System Configuration Utility is available under System Configuration menu.
  - Array Configuration Utility is available under the System Configuration menu.

- Drive Array Advanced Diagnostics Utility is available under the Diagnostics and Utilities menu.
- ROMPaq Firmware Upgrade Utility is available under the Diagnostics and Utilities menu.

■ **Run the Utilities from diskette.**

You can also run the utilities from their individual diskettes. If you have a utility diskette newer than the version on the SmartStart and Support Software CD, use that diskette.

You can also create a diskette version of the utility from the SmartStart and Support Software CD. To create diskette versions of the utilities from the CD:

1. Boot the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select *Create Support Software* and select *Next*.
3. Select the diskette you would like to create from the list and follow the instructions on the screen.

■ **Run the Utilities from the Compaq SmartStart and Support Software CD.**

IMPORTANT: Only the System Configuration Utility and the Array Configuration Utility can be executed from the Compaq SmartStart and Support Software CD. All other utilities can be executed only from the system partition or from diskette.

To run these utilities directly from the Compaq SmartStart and Support Software CD:

1. Boot the Compaq SmartStart and Support Software CD.
2. From the Compaq System Utilities screen, select the utility you wish to run and select *Next*.
   - To execute the System Configuration Utility, select *Run System Configuration Utility*.
   - To execute the Array Configuration Utility, select *Run Array Configuration Utility*.

Power-On Self-Test (POST)

POST is a series of diagnostic tests that runs automatically on Compaq computers when the system is turned on. POST checks the following assemblies to ensure that the computer system is functioning properly:

- Keyboard
- Power supply
- System board
- Memory
- Memory expansion boards
- Controllers
- Diskette drives
- Hard drives

If POST finds an error in the system, an error condition is indicated by an audible and/or a visual message. If an error code is displayed on the screen during POST or after resetting the system, follow the instructions in Table 3-1. The error messages and codes listed in Table 3-1 include all codes generated by Compaq products. Your system generates only those codes that are applicable to your configuration and options.

Table 3-1
POST Error Messages

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
A Critical Error occurred prior to this power-up	None	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
101-ROM Error	1L, 1S	System ROM checksum	Run Diagnostics. Replace failed assembly as indicated.
101-I/O ROM Error	None	Options ROM checksum	Run Diagnostics. Replace failed assembly as indicated.
102-System Board Failure	None	DMA, timers, etc.	Replace the system board. Run the Compaq System Configuration Utility.
104-ASR-2 Timer Failure	None	System board failure stet	Run Diagnostics. Replace failed assembly as indicated.
162-System Options Not Set	2S	Configuration incorrect	Run the System Configuration Utility and correct.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
163-Time & Date Not Set	2S	Invalid time or date in configuration memory.	Run the System Configuration Utility and correct.
164-Memory Size Error	2S	Configuration memory incorrect.	Run the System Configuration Utility and correct.
170- Expansion Device Not Responding	None	EISA or PCI expansion board failure.	Check board for secure installation. Replace the failed board if necessary.
172- Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt or jumper installed.	Run the System Configuration Utility and correct.
172-1 Configuration Nonvolatile Memory Invalid	None	Nonvolatile configuration corrupt.	Run the System Configuration Utility and correct.
173- Slot ID Mismatch	None	Board replaced, configuration not updated.	Run the System Configuration Utility and correct.
174- Configuration/Slot Mismatch Device Not Found	None	EISA or PCI board not found.	Run the System Configuration Utility and correct.
175- Configuration/Slot Mismatch Device Found	None	EISA or PCI board added, configuration not updated.	Run the System Configuration Utility and correct.
176-Slot with Not Readable ID Yields Valid ID	None	EISA or PCI board in slot that should contain an ISA board.	Run the System Configuration Utility and correct.
177-Configuration Not Complete	None	Incomplete System Configuration.	Run the System Configuration Utility and correct.
178-Processor Configuration Invalid	None	Processor type or step does not match configuration memory.	Run the System Configuration Utility and correct.
179-System Revision Mismatch	None	A board was installed that has a different revision date.	Run the System Configuration Utility and correct.
201-Memory Error	None	RAM failure.	Run Diagnostics. Replace failed assembly as indicated.
203-Memory Address Error	None	RAM failure.	Run Diagnostics. Replace failed assembly as indicated.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
205-Cache Memory Error	None	Cache memory error.	Replace the processor board in the slot indicated.
205-Option Cache Memory Error	None	Option cache memory error.	Replace the option cache board.
206-Cache Controller Error	None	Cache controller failure.	Run Diagnostics. Replace failed assembly as indicated.
207-Invalid Memory Configuration - Check DIMM [SIMM] Installation	None	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed - Check DIMM [SIMM] Installation	1L, 1S	The speed of the memory is too slow, where: xx00 = expansion board SIMMs are too slow, or 00yy = system board SIMMs are too slow. xx and yy have corresponding bit set.	The speed of the memory modules must be 60 ns. Verify the speed of the memory modules installed and replace.
211-Cache Switch Set Incorrectly	None	Switch not set properly during installation or upgrade.	Verify switch settings.
212-System Processor Failed/Mapped out	1S	Processor in slot x failed.	Run Diagnostics and replace failed processor.
213-Cache Size Error	None	Invalid optional cache size.	Replace cache with 256K cache.
213-System Processor Not Installed	1S	System processor configured for slot indicated is missing.	Install processor in the slot indicated or run the System Configuration Utility to remove the processor from the *.CFG* file.
214-DC-DC Converter Failed	None	PowerSafe Module (DC-DC Converter) failed.	Run Diagnostics. Replace failed assembly as indicated.
301-Keyboard Error	None	Keyboard failure.	Turn off the computer, then reconnect the keyboard.
301-Keyboard Error or Test Fixture Installed	None	Keyboard failure.	Replace the keyboard.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
ZZ-301-Keyboard Error	None	Keyboard failure. (*ZZ* represents the Keyboard Scan Code.)	1. A key is stuck. Try to free it. 2. Replace the keyboard.
303-Keyboard Controller Error	None	System board, keyboard, or mouse controller failure.	1. Run Diagnostics. 2. Replace failed assembly as indicated.
304-Keyboard or System Unit Error	None	Keyboard, keyboard cable, or system board failure.	1. Make sure the keyboard is attached. 2. Run Diagnostics to determine which is in error. 3. Replace the part indicated.
40X-Parallel Port X Address Assignment Conflict	2S	Both external and internal ports are assigned to parallel port X.	Run the System Configuration Utility and correct.
402-Monochrome Adapter Failure	1L, 2S	Monochrome display controller.	Replace the monochrome display controller.
501-Display Adapter Failure	1L, 2S	Video display controller.	Replace the video board.
601-Diskette Controller Error	None	Diskette controller circuitry failure.	1. Make sure the diskette drive cables are attached. 2. Replace the diskette drive and/or cable. 3. Replace the system board.
605-Diskette Drive Type Error	2S	Mismatch in drive type.	Run the System Configuration Utility to set diskette type correctly.
702-A coprocessor has been detected that was not reported by CMOS	None	Installed coprocessor not configured.	Run the System Configuration Utility and correct.
703-CMOS reports a coprocessor that has not been detected	2S	Coprocessor or configuration error.	1. Run the System Configuration Utility and correct. 2. Replace the coprocessor.
1151-Com Port 1 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM1.	Run the System Configuration Utility and correct.
1152-Com Port 2, 3, or 4 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM2, COM3 or COM4.	Run the System Configuration Utility and correct.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1600-Server Manager/R Failure	None	Server Manager/R board failure. Error code displays after error message.	Run Diagnostics. Replace failed assembly as indicated.
1610-Temperature violation detected. Waiting for system to cool.	2S	Ambient system temperature too hot.	Check fan in system environment.
1611-Fan failure detected.	2S	Required fan not installed or spinning.	Check fans.
1612-Primary power supply failure	2S	Primary power supply has failed.	Replace power supply as soon as possible.
1613-Low System Battery	None	Real time clock system battery is running low on power.	Run Diagnostics. Replace failed assembly as indicated.
1701-SCSI Controller failure	None	A test on the Fast SCSI-2 Controller failed.	Run Diagnostics. Replace failed assembly as indicated.
1702-SCSI cable error detected. System halted.	None	Incorrect cabling.	1. For Integrated SCSI Controllers, be sure that the internal connector has SCSI termination attached. 2. For option card SCSI controllers, be sure that only one of the two internal connectors has termination attached.
1703-SCSI cable error detected. Internal SCSI cable not attached to system board connector. System halted.	None	Incorrect cabling.	Be sure that the integrated SCSI controller has SCSI termination attached.
1704-Unsupported Virtual Mode Disk Operation. DOS Driver Required. System halted.	None	System attempted to perform a virtual mode disk operation without virtual mode memory services.	Use fixed-disk device driver that supports virtual mode memory services.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1705-Locked SCSI Bus Detected. System halted.	None	SCSI bus failure.	Run Diagnostics. Replace failed assembly as indicated.
1730-Fixed Disk 0 does not support DMA Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1731-Fixed Disk 1 does not support DMA Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1740-Fixed Disk 0 failed Set Block Mode command.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1741-Fixed Disk 1 failed Set Block Mode command.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1750-Fixed Disk 0 failed Identify command.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1751-Fixed Disk 1 failed Identify command.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1760-Fixed Disk 0 does not support Block Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1761-Fixed Disk 1 does not support Block Mode.	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1764-Slot x Drive Array - Capacity Expansion Process is temporarily disabled (followed by one of the following): Expansion will resume when Array Accelerator has been reattached. Expansion will resume when Array Accelerator has been replaced. Expansion will resume when Array Accelerator RAM allocation is successful. Expansion will resume when Array Accelerator battery reaches full charge. Expansion will resume when automatic data recovery has been completed.			Reattach or replace Array Accelerator, wait until the Array Accelerator batteries have charged, or Automatic Data Recovery has completed, as indicated.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1765-Slot x Drive Array Option ROM Appears to Conflict With an ISA Card. ISA cards with 16-bit memory cannot be configured in memory range C0000 to DFFFF along with the SMART-2/E 8-bit Option ROM due to EISA bus limitations. Please remove or reconfigure your ISA card.			Remove or reconfigure conflicting ISA cards. Disable "shared memory" on any ISA network cards that may be installed.
1766-Slot x Drive Array requires System ROM Upgrade. Run Systems ROMPaq Utility.			Run the latest Systems ROMPaq Utility to upgrade your System ROMs.
1767-Slot x Drive Array Option ROM is Not Programmed Correctly or may Conflict with the Memory Address Range of an ISA Card. Check the Memory Address Configuration of installed ISA Card(s) or run Options ROMPaq Utility to attempt SMART-2/E Option ROM Reprogramming.			Remove or reconfigure conflicting ISA cards, especially any cards that are not recognized by the System Configuration Utility. Try reprogramming the SMART-2/E Controller's ROMs using the latest Options ROMPaq (version 2.29 or higher).
1768-Slot x Drive Array -Resuming logical drive expansion process.	None	SMART-2 Controller error	No action required. Appears whenever a controller reset or power cycle occurs while array expansion is in progress.
1769-Slot x Drive Array - Drive(s) disabled due to failure during expand. Select **F1** to continue with logical drives disabled. Select **F2** to accept data loss and to re-enable logical drives.	None	SMART-2 Controller error	Data has been lost while expanding the array, therefore the drives have been temporarily disabled. Press **F2** to accept the data loss and re-enable the logical drives. Restore data from backup.
1771-Primary Disk Port Address Assignment Conflict	None	Internal and external hard drive controllers are both assigned to the primary address.	Run the System Configuration Utility and correct.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1772-Secondary Disk Port Address Assignment Conflict	None	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the System Configuration Utility and correct.
1773-Primary Fixed Disk Port Assignment Conflict	None	Fixed disk drive error.	Run the System Configuration Utility and correct.
1774-Slot x Drive Array - Obsolete data found in Array Accelerator. Select **F1** to discard contents of Array Accelerator. Select **F2** to write contents of Array Accelerator to drives.	None	SMART-2 Controller error.	Data found in Array Accelerator is older than data found on drives. Press **F1** to discard the older data in the Array Accelerator and retain the newer data on the drives.
1776-Drive Array - SCSI Port Termination Error.	None	External and internal SCSI drives are both configured to Port 1.	Reconfigure drives.
1777-Drive Array External Drive Subsystem Error.	None	Cooling fan failure, internal temperature alert or open side panel.	Inspect for cooling fan failure or open side panel.
1778-Drive Array resuming Automatic Data Recovery process.	None	This message appears whenever a controller reset or power cycle occurs while Automatic Data Recovery is in progress.	No action necessary.
1779-Drive Array Controller detects replacement drives.	None	Intermittent drive failure and/or possible loss of data.	If this message appears and drive *X* has not been replaced, this indicates an intermittent drive failure. This message also appears once immediately following drive replacement whenever data must be restored from backup.
1780-Disk 0 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1781-Disk 1 Failure	None	Hard drive/format error.	Run Diagnostics. Replace failed assembly as indicated.
1782-Disk Controller Failure	None	Hard disk drive circuitry error.	Run Diagnostics. Replace failed assembly as indicated.
1784-Drive Array Drive Failure, Physical Drive	None	Defective drive and/or cables.	Check for loose cables. Replace defective drive *X* and/or cable(s).
1785-Drive Array not Configured.	None	Configuration error.	Run the System Configuration Utility and correct.
1786-Drive Array Recovery Needed The following drive(s) need Automatic Data Recovery: Drive *X*. Select "F1" to continue with recovery of data to drive(s). Select "F2" to continue without recovery of data to drive(s).	None	Interim Data Recovery mode. Data has not been recovered yet.	Press **F1** key to allow Automatic Data Recovery to begin. Data will automatically be restored to drive *X* now that the drive has been replaced or now seems to be working. -Or- Press the **F2** key and the system will continue to operate in the Interim Data Recovery mode.
1787-Drive Array Operating in Interim Recovery Mode. Physical drive replacement needed: Drive *X*	None	Hard drive *X* failed or cable is loose or defective. Following a system restart, this message reminds you that drive *X* is defective and fault tolerance is being used.	1. Replace drive X as soon as possible. 2. Check loose cables. 3. Replace defective cables.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
*1788-Incorrect Drive Replaced: Drive *X* Drive(s) were incorrectly replaced: Drive *Y* Select "F1" to continue - drive array will remain disabled. Select "F2" to reset configuration - all data will be lost.	None	Drives are not installed in their original positions, so the drives have been disabled. *See* note below.	Reinstall the drives correctly as indicated. Press **F1** to restart the computer with the drive array disabled. -Or- Press **F2** to use the drives as configured and lose all the data on them.
***NOTE**: The 1788 error message might also be displayed inadvertently due to a bad power cable connection to the drive or by noise on the data cable. If this message was due to a bad power cable connection, not an incorrect drive replacement, repair the connection and press **F2**. -Or- If this message was not due to a bad power cable connection and no drive replacement took place, this could indicate noise on the data cable. Check cable for proper routing.			
1789-Drive Not Responding, Physical Drive Check cables or replace physical drive *X*. Select "F1" to continue - drive array will remain disabled. Select "F2" to fail drive(s) that are not responding - Interim Recovery Mode will be enabled if configured for fault tolerance.	None	Cable or hard drive failure.	1. Check the cable connections. 2. If cables are connected, replace the drive. 3. If you do not want to replace the drives now, press F2.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1790-Disk 0 Configuration Error	None	Hard drive error or wrong drive type.	Run the System Configuration Utility and Diagnostics and correct.
1791-Disk 1 Error	None	Hard drive error or wrong drive type.	Run the System Configuration Utility and Diagnostics and correct.
1792-Drive Array Reports Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Power was then restored within eight to ten days, and the data in the Array Accelerator was flushed to the drive array.	No action necessary; no data has been lost. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.
1793-Drive Array - Array Accelerator Battery Depleted - Data Lost. (Error message 1794 also displays.)	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. Array Accelerator batteries failed. Data in Array Accelerator has been lost.	Power was not restored within eight to ten days. Perform orderly system shutdowns to avoid data remaining in the Array Accelerator.
1794-Drive Array - Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.	None	This is a warning that the battery charge is below 75%. Posted writes are disabled.	Replace the Array Accelerator board if batteries do not recharge within 36 power-on hours.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1795-Drive Array - Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	None	This indicates that while the system was in use, power was interrupted while data was in the Array Accelerator memory. The data stored in the Array Accelerator does not correspond to this drive array.	Match the Array Accelerator to the correct drive array, or run the System Configuration Utility to clear the data in the Array Accelerator.
1796-Drive Array - Array Accelerator Not Responding. Array Accelerator is temporarily disabled.	None	Array Accelerator is defective or has been removed.	1. Check that the Array Accelerator is properly seated. 2. Run the System Configuration Utility to reconfigure the Compaq IDA-2 without the Array Accelerator.
1797-Drive Array - Array Accelerator Read Error Occurred. Data in Array Accelerator has been lost. Array Accelerator is disabled.	None	Hard parity error while reading data from posted writes memory.	Enable Array Accelerator.

Continued

POST Error Messages *Continued*

Error Code	Audible Beeps L=Long S=Short	Probable Source of Problem	Action
1798-Drive Array - Array Accelerator Write Error Occurred. Array Accelerator is disabled.	None	Hard parity error while writing data to posted writes memory.	Enable Array Accelerator.
1799-Drive Array - Drive(s) Disabled due to Array Accelerator Data Loss. Select "F1" to continue with logical drives disabled. Select "F2" to accept data loss and to re-enable logical drives.	None	Volume failed due to loss of data in posted-writes memory.	Press **F1** to continue with logical drives disabled or **F2** to accept data loss and re-enable logical drive.
Beeps only: 2 Long + 2 Short	2L, 2S	Power is cycled. Temperature too hot. Processor fan not installed or spinning.	Check fans.
(Run System Configuration Utility - **F10** key)	None	A configuration error occurred during POST.	Press **F10** to run System Configuration Utility.
(RESUME - **F1** KEY)	None	As indicated to continue.	Press the **F1** key.

Diagnostics Software

The error messages and codes listed in Table 3-1 include all codes generated by Compaq products. Your system generates only those codes that are applicable to your configuration and options.

When you select Diagnostics and Utilities from the System Configuration Utility main menu, the utility prompts you to test, inspect, upgrade, and diagnose the server.

Diagnostics and Utilities are located on the system partition on the hard drive and must be accessed when a system configuration error is detected during the Power-On Self-Test (POST). Compaq Diagnostics software is also available on the Compaq SmartStart and Support Software CD.

The following options are available from the Diagnostics and Utilities menu:

- Test Computer
- Inspect Computer
- Upgrade Firmware
- Remote Utilities
- Diagnose Drive Array

Diagnostic error codes are generated when the diagnostics software recognizes a problem. These error codes help identify possible defective subassemblies. Tables 3-2 through 3-17 list possible error codes, a description of the error condition, and the action required to resolve the error condition.

In each case, the Recommended Action column lists the steps necessary to correct the problem. After completing each step, run the diagnostics program to verify whether the error condition has been corrected. If the error code reappears, perform the next step, then run the diagnostics program again. Follow this procedure until the diagnostics program no longer detects an error condition.

If you encounter an error condition, complete the following steps before starting problem isolation procedures:

1. Be sure that there is proper ventilation. The computer should have approximately 12 inches (30.5 cm) clearance at the front and back of the system unit.
2. Turn off the computer and peripheral devices.
3. Disconnect any peripheral devices not required for testing. Do not disconnect the printer if you want to test it or use it to log error messages.
4. Turn on the computer.
5. Delete the power-on password, if set. You will know that the power-on password is set when a key icon appears on the screen when POST completes. If this occurs, you must enter the password to continue. To delete the password, type the current password, a forward slash (/), and press the **Enter** key.

6. If you do not have access to the password, you must disable the power-on password by using the Password Disable switch on the system board.
7. When required by diagnostics, install a loopback plug (Part Number 142054-001).
8. Run the latest version of diagnostics.

Running Diagnostics

There are two ways to access the utilities:

- From the System Partition
- From diskette. A diskette can be created from the SmartStart CD.

Accessing the utilities from the system partition:

1. Reboot the server by pressing the **Ctrl+Alt+Delete** keys.
2. Press **F10** when the following prompt appears at the top of the screen during POST.

> Press **"F10"** for System Partition Utilities.

IMPORTANT: The text appears for only two seconds. If you do not press **F10** during this time, you must reboot the server.

3. From the System Configuration Main Menu, select *Diagnostics and Utilities.*

   If there are errors detected in your Server Health Log, the Diagnostics Utility automatically displays the following screen message:

> CAUTION: Errors have been detected in you Server Health Log. Diags will now identify your system hardware.

4. Press the **Enter** key to continue.
5. After a short pause, the Server Health Log menu displays with a list of system errors. If there is more than one error, press the Spare Bar to select the error you want to correct, then press **Enter**.
6. The Diagnostics Utility prompts you and suggests corrective action.

Primary Processor Test Error Codes

The 100 series of Diagnostic error codes identifies failures with processor and system board functions. Corrective action may require replacement of system boards or processor assemblies (either processor boards or system boards that include the processor).

Table 3-2
Primary Processor Test Error Codes

Error Code	Description	Recommended Action
101-xx	CPU test failed.	Replace the processor board and retest.
103-xx 104-xx 105-xx 106-xx	DMA page registers test failed. Interrupt controller master test failed. Port 61 error. Keyboard controller self-test failed.	For error codes 103-xx through 106-xx, replace the processor board and retest.
107-xx 108-xx 109-xx	CMOS RAM test failed. CMOS interrupt test failed. CMOS clock load data test failed.	The following steps apply to error codes 107-xx through 109-xx. 1. Replace the battery/clock module and retest. 2. Replace the system board and retest.
110-xx 111-xx 112-xx 113-xx	Programmable timer load data test failed. Refresh detect test failed. Speed test slow mode out of range. Protected mode test failed.	For error codes 110-xx through 113-xx, replace the system board and retest.
114-xx	Speaker test failed.	1. Verify the speaker connection and retest. 2. Replace the speaker and retest. 3. Replace the system board and retest.
116-xx	Cache test failed.	Replace the system board and retest.
122-xx 123-xx	Multiprocessor Dispatch test failed. Interprocessor Communication test failed.	1. Check the system configuration and retest. 2. Replace the processor board and retest. 3. Replace the system board and retest.
199-xx	Installed devices test failed.	1. Check the system configuration and retest. 2. Verify cable connections and retest. 3. Check switch and/or jumper settings and retest. 4. Run the Configuration utility and retest. 5. Replace the processor board and retest. 6. Replace the system board and retest.

Memory Test Error Codes

The 200 series of Diagnostic error codes identifies failures with the memory subsystem. Corrective action may require replacement of the memory expansion board, the memory modules, or the processor assembly.

Table 3-3
Memory Test Error Codes

Error Code	Description	Recommended Action
200-xx	Invalid memory configuration.	Reinsert memory modules in correct location and retest.
201-xx 202-xx	Memory machine ID test failed. Memory system ROM checksum failed.	The following steps apply to error codes 201-xx and 202-xx: 1. Replace the system ROM and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
203-xx 204-xx 205-xx 206-xx	Memory write/read test failed. Memory address test failed. Walking I/O test failed. Increment pattern test failed.	The following steps apply to error codes 203-xx through 210-xx: 1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
207-xx	Invalid memory configuration-check DIMM installation. DIMMs installed have 8K refresh.	Replace DIMMs.
208-xx	Invalid memory speed detected - check DIMM installation. Slow DIMMs may cause data loss.	Replace DIMMs with timing greater than 60 ns.
210-xx	Random pattern test failed.	The following steps apply to error code 210-xx: 1. Replace the memory module and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
215	Non-functioning DC-DC converter for processor X.	Replace the DC-DC converter (processor power module).

Keyboard Test Error Codes

The 300 series of Diagnostic error codes identifies failures with keyboard and system board functions. Corrective action may require replacement of the keyboard or the system board assembly.

Table 3-4
Keyboard Test Error Codes

Error Code	Description	Recommended Action
301-xx	Keyboard short test, 8042 self-test failed.	The following steps apply to error codes 301-xx through 304-xx: 1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard and retest. 2. Replace the keyboard and retest. 3. Replace the system board and retest.
302-xx	Keyboard long test failed.	
303-xx	Keyboard LED test, 8042 self-test failed.	
304-xx	Keyboard typematic test failed.	

Parallel Printer Test Error Codes

The 400 series of Diagnostic error codes identifies failures with parallel printer interface card or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

Table 3-5
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
401-xx	Printer failed or not connected.	The following steps apply to error codes 401-xx through 498-xx: 1. Connect the printer and retest. 2. Check the power to the printer and retest. 3. Install the loopback connector and retest. 4. Check the switch on the Serial/Parallel Interface board (if applicable) and retest. 5. Replace the Serial/Parallel Interface board (if applicable) and retest. 6. Replace the system board and retest.
402-xx	Printer data register failed.	
403-xx	Printer pattern test failed.	
498-xx	Printer failed or not connected.	

Video Display Unit Test Error Codes

The 500 series of Diagnostic error codes identifies failures with video or system board functions. Corrective action may require replacement of the video board or the system board assembly.

Table 3-6
Video Display Unit Test Error Codes

Error Code	Description	Recommended Action
501-xx	Video controller test failed.	The following steps apply to error codes 501-xx through 516-xx: 1. Replace the monitor and retest. 2. Replace the Advanced VGA board and retest. 3. Replace the system board and retest.
502-xx	Video memory test failed.	
503-xx	Video attribute test failed.	
504-xx	Video character set test failed.	
505-xx	Video 80 x 25 mode 9 x 14 character cell test failed.	
506-xx	Video 80 x 25 mode 8 x 8 character cell test failed.	
507-xx	Video 40 x 25 mode test failed.	
508-xx	Video 320 x 200 mode color set 0 test failed.	
509-xx	Video 320 x 200 mode color set 1 test failed.	
510-xx	Video 640 x 200 mode test failed.	
511-xx	Video screen memory page test failed.	
512-xx	Video gray scale test failed.	
514-xx	Video white screen test failed.	
516-xx	Video noise pattern test failed.	

Diskette Drive Test Error Codes

The 600 series of Diagnostic error codes identifies failures with diskette, diskette drive, or system board functions. Corrective action may require replacement of the diskette, the diskette drive, or the system board assembly.

Table 3-7
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
600-xx	Diskette ID drive types test failed.	The following steps apply to error codes 600-xx through 698-xx: 1. Replace the diskette and retest. 2. Check and/or replace the diskette power and signal cables and retest. 3. Replace the diskette drive and retest. 4. Replace the system board and retest.
601-xx	Diskette format failed.	
602-xx	Diskette read test failed.	
603-xx	Diskette write/read/compute test failed.	
604-xx	Diskette random seek test failed.	
605-xx	Diskette ID media failed.	
606-xx	Diskette speed test failed.	
607-xx	Diskette wrap test failed.	
608-xx	Diskette write protect test failed.	
609-xx	Diskette reset controller test failed.	
610-xx	Diskette change line test failed.	
694-xx	Pin 34 is not cut on 360 KB diskette drive.	
697-xx	Diskette type error.	
698-xx	Diskette drive speed not within limits.	
699-xx	Diskette drive/media ID error.	The following steps apply to 699-xx error codes: 1. Replace the media and retest. 2. Run the Configuration utility and retest.

Monochrome Video Board Test Error Codes

The 800 series of Diagnostic error codes identifies failures with monochrome video boards or system board functions. Corrective action may require replacement of a monochrome video board or the system board assembly.

Table 3-8
Monochrome Video Board Test Error Codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed.	The following steps apply to error codes 802-xx and 824-xx: 1. Replace monitor and retest. 2. Replace the Advanced VGA board and retest. 3. Replace monochrome board and retest. 4. Replace the system board and retest.
824-xx	Monochrome video text mode test failed.	

Serial Test Error Codes

The 1100 series of Diagnostic error codes identifies failures with serial/parallel interface board or system board functions. Corrective action may require replacement of the serial/parallel interface board or the system board assembly.

Table 3-9
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	The following steps apply to error codes 1101-xx and 1109-xx: 1. Check the switch settings on the Serial/Parallel Interface board (if applicable) and retest. 2. Replace the Serial/Parallel Interface board (if applicable) and retest. 3. Replace the system board and retest.
1109-xx	Clock register test failed.	

Modem Communications Test Error Codes

The 1200 series of Diagnostic error codes identifies failures with the modem. Corrective action may require replacement of the modem.

Table 3-10
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed.	The following steps apply to error codes 1201-xx through 1210-xx: 1. Refer to the modem documentation for correct setup procedures and retest. 2. Check the modem line and retest. 3. Replace the modem and retest.
1202-xx	Modem time-out test failed.	
1203-xx	Modem external termination test failed.	
1204-xx	Modem auto originate test failed.	
1206-xx	Dial multi-frequency tone test failed.	
1210-xx	Modem direct connect test failed.	

Fixed Disk Drive Test Error Codes

The 1700 series of Diagnostic error codes identifies failures with fixed disk drives, fixed disk drive controller boards, fixed disk drive cabling, and system board functions. Corrective action may require replacement of the fixed disk drive cables, fixed disk drive controller, fixed disk, or system board assembly. If your system uses a drive array controller, see the section for Drive Array Advanced Diagnostics (DAAD).

Table 3-11
Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
1700-xx	Fixed disk ID drive types test failed.	The following steps apply to error codes 1700-xx through 1799-xx: 1. Run the System Configuration Utility and verify the drive type. 2. Replace the fixed disk drive signal and power cables and retest. 3. Replace the fixed disk drive controller and retest. 4. Replace the fixed disk drive and retest. 5. Replace the system board and retest.
1701-xx	Fixed disk format test failed.	
1702-xx	Fixed disk read test failed.	
1703-xx	Fixed disk write/read/compare test failed.	
1704-xx	Fixed disk random seek test failed.	
1705-xx	Fixed disk controller test failed.	
1708-xx	Fixed disk format bad track test failed.	
1709-xx	Fixed disk reset controller test failed.	
1710-xx	Fixed disk park head test failed.	
1715-xx	Fixed disk head select test failed.	
1716-xx	Fixed disk conditional format test failed.	
1717-xx	Fixed disk ECC* test failed.	
1719-xx	Fixed disk drive power mode test failed.	
1736-xx	Drive Monitoring failed.	
1799-xx	Invalid fixed disk drive type failed.	

* Error Checking and Correcting

Tape Drive Test Error Codes

The 1900 series of Diagnostic error codes identifies failures with tape cartridge, tape drive, tape drive cabling, adapter board, or system board assembly. Corrective action may require replacement of the tape cartridge, tape drive cabling, adapter board, tape drive, or system board assembly.

Table 3-12
Tape Drive Test Error Codes

Error Code	Description	Recommended Action
1900-xx	Tape ID failed.	The following steps apply to error codes 1900-xx through 1906-xx: 1. Replace the tape cartridge and retest. 2. Check and/or replace the signal cable and retest. 3. Check the switch settings on the adapter board (if applicable). 4. Replace the tape adapter board (if applicable) and retest. 5. Replace the tape drive and retest. 6. Replace the system board and retest.
1901-xx	Tape servo write failed.	
1902-xx	Tape format failed.	
1903-xx	Tape drive sensor test failed.	
1904-xx	Tape BOT/EOT test failed.	
1905-xx	Tape read test failed.	
1906-xx	Tape write/read/compare test failed.	

Advanced VGA Board Test Error Codes

The 2400 series of Diagnostic error codes identifies failures with the video board, monitor, or system board assembly. Corrective action may require replacement of the monitor, video board, or system board assembly.

Table 3-13
Advanced VGA Board Test Error Codes

Error Code	Description	Recommended Action
2402-xx	Video memory test failed.	The following steps apply to error codes 2402-xx through 2456-xx: 1. Run the System Configuration Utility. 2. Replace the monitor and retest. 3. Replace the Advanced VGA board or other video board and retest. 4. Replace the system board and retest.
2403-xx	Video attribute test failed.	
2404-xx	Video character set test failed.	
2405-xx	Video 80 x 25 mode 9 x 14 character cell test failed.	
2406-xx	Video 80 x 25 mode 8 x 8 character cell test failed.	
2407-xx	Video 40 x 25 mode test failed.	
2408-xx	Video 320 x 320 mode color set 0 test failed.	
2409-xx	Video 320 x 320 mode color set 1 test failed.	
2410-xx	Video 640 x 200 mode test failed.	
2411-xx	Video screen memory page test failed.	
2412-xx	Video gray scale test failed.	
2414-xx	Video white screen test failed.	The following steps apply to error codes 2402-xx through 2456-xx: 1. Run the System Configuration Utility. 2. Replace the monitor and retest. 3. Replace the Advanced VGA board or other video board and retest. 4. Replace the system board and retest.
2416-xx	Video noise pattern test failed.	
2417-xx	Lightpen text mode test failed, no response.	
2418-xx	ECG/VGC memory test failed.	
2419-xx	ECG/VGC ROM checksum test failed.	
2420-xx	ECG/VGC attribute test failed.	
2421-xx	ECG/VGC 640 x 200 graphics mode test failed.	
2422-xx	ECG/VGC 640 x 350 16-color set test failed.	
2423-xx	ECG/VGC 640 x 350 64-color test failed.	
2424-xx	ECG/VGC monochrome text mode test failed.	
2425-xx	ECG/VGC monochrome graphics mode test failed.	
2431-xx	640 x 480 graphics test failed.	
2432-xx	320 x 200 graphics (256-color mode) test failed.	
2448-xx	Advanced VGA Controller test failed.	
2451-xx	132-column Advanced VGA test failed.	
2456-xx	Advanced VGA 256-Color test failed.	
2458-xx	Advanced VGA Bit BLT Test	The following steps apply to error codes 2458-xx through 2480-xx: 1. Run Setup. 2. Replace the system board and retest.
2468-xx	Advanced VGA DAC Test	
2477-xx	Advanced VGA Data Path Test	
2480-xx	Advanced VGA DAC Test	

32-Bit DualSpeed NetFlex-2 Controller and 32-Bit DualSpeed NetFlex-2 Token Ring Controller Test Error Codes

The 6000 series of Diagnostic error codes identifies failures with 32-bit DualSpeed NetFlex-2/Token Ring Controllers. Corrective action may require replacement of the 32-bit DualSpeed NetFlex-2/Token Ring Controller.

Table 3-14
32-Bit DualSpeed NetFlex-2 Controller and 32-Bit DualSpeed NetFlex-2 Token Ring Controller Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network card ID failed.	The following steps apply to error codes 6000-xx through 6089-xx: 1. Check the controller installation in the EISA slot. 2. Check the interrupt type and number setting. 3. Check the media connection at the controller and Multistation Access Unit (MAU)*. 4. Check the media speed (4/16) and type Unshielded Twisted Pair/Shielded Twisted Pair (UTP/STP) settings. 5. Check the MAU, cabling, or other network components. 6. Replace the controller.
6001-xx	Network card setup failed.	
6002-xx	Network card transmit failed.	
6014-xx	Network card Configuration failed.	
6016-xx	Network card Reset failed.	
6028-xx	Network card Internal failed.	
6029-xx	Network card External failed.	
6089-xx	Network card Open failed.	

SCSI Fixed Disk Drive Test Error Codes

The 6500 series of Diagnostic error codes identify failures with SCSI fixed disk drives, SCSI fixed disk drive controller boards, SCSI fixed disk drive cabling, and system board functions. Corrective action may require replacement of the fixed disk drive cables, fixed disk drive controller, fixed disk, or system board assembly. If your system uses a drive array controller, see the section for Drive Array Advanced Diagnostics (DAAD).

Table 3-15
SCSI Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
6500-xx	SCSI Disk ID drive types test failed.	The following steps apply to error codes 6500-xx through 6599-xx: 1. Run the System Configuration Utility and verify the drive type. 2. Replace the SCSI disk drive signal and power cables and retest. 3. Replace the SCSI controller and retest. 4. Replace the SCSI disk drive and retest. 5. Replace the system board and retest.
6502-xx	SCSI Disk Unconditional Format test failed.	
6505-xx	SCSI Disk Read Test Failed.	
6506-xx	SCSI Disk SA/Media test failed.	
6509-xx	SCSI Disk Erase tape test failed.	
6523-xx	SCSI Disk Random Read test failed.	
6528-xx	Media load/unload test failed.	

SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of Diagnostic error codes identifies failures with the CD-ROM cabling, CD-ROM drive, adapter board, or system board assembly. Corrective action may require replacement of the CD-ROM cabling, CD-ROM drive, adapter board, or system board assembly.

Table 3-16
SCSI/IDE CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
6600-xx	CD-ROM ID failed.	The following steps apply to error codes 6600-xx through 6605-xx: 1. Replace the CD-ROM media and retest. 2. Check and/or replace the signal cable and retest. 3. Check the switch settings on the adapter board (if applicable). 4. Replace the SCSI controller (if applicable) and retest. 5. Replace the CD-ROM drive and retest. 6. Replace the system board and retest.
6605-xx	CD-ROM Read failed.	

SCSI Tape Drive Test Error Codes

The 6700 series of Diagnostic error codes identifies failures with tape cartridge, tape drive, media changer, tape drive cabling, adapter board, or system board assembly. Corrective action may require replacement of the tape cartridge, tape drive, media changer, tape drive cabling, adapter board, or system board assembly.

Table 3-17
SCSI Tape Drive Test Error Codes

Error Code	Description	Recommended Action
6700-xx	SCSI Tape ID drive types test failed.	The following steps apply to error codes 6700-xx through 6799-xx: 1. Run the System Configuration Utility and verify the drive type. 2. Replace the SCSI Tape drive signal and power cables and retest. 3. Replace the SCSI controller and retest. 4. Replace the SCSI Tape drive and retest. 5. Replace the system board and retest.
6706-xx	SCSI Disk SA/Media test failed.	
6709-xx	SCSI Disk Erase tape test failed.	
6728	Media load/unload test failed.	

Server Manager/R Board Test Error Codes

The 7000 series of Diagnostic error codes identifies failures with the Server Manager/R board. Corrective action may require replacement of the Server Manager/R board, the Integrated 2400-baud modem, voice ROM, or battery on the Server Manager/R board.

Table 3-18
Server Manager/R Board Test Error Codes

Error Code	Description	Recommended Action
7000-11	Processor (80186 Timer)	For error codes 7000-11 through 7000-46, replace the Server Manager/R board and retest.
7000-12	Processor (80186 Registers)	
7000-13	Processor (Watch Dog Timer)	
7000-14	Processor (8570 RAM)	
7000-15	Processor (8570 RTC)	
7000-21	Memory	
7000-22	Memory Write/Read	
7000-23	Memory Address	
7000-24	Memory Refresh Alert	
7000-25	Memory Increment	
7000-26	Memory Random Data	
7000-27	Memory Disturb Address	
7000-28	Memory HBM	
7000-33	HBM IO	
7000-34	HBM BMIC	
7000-35	HBM Video	
7000-41	ser_int	
7000-42	ser_int	
7000-43	ser_ext	
7000-44	ser_ext	
7000-45	ser_ext_int	
7000-46	ser_ext_int	
7000-51	mdm_int	For error codes 7000-51 through 7000-57, replace the Server Manager/R board Enhanced 2400-Baud Integrated Modem and retest.
7000-52	mdm_int	
7000-53	mdm_ext	
7000-54	mdm_ext	
7000-55	mdm_ext_int	
7000-56	mdm_ext_int	
7000-57	mdm\c\analog	
7000-61	Voice/DTMF Internal Loopback	For 7000-61 and 7000-62 error codes, replace the Server Manager/R board Voice ROM.
7000-62	Voice/DTMF Internal Loopback	
7000-78	Host ADC Measurements	For 7000-78 and 7000-79 error codes, replace the Server Manager/R board battery.
7000-79	Battery	

Pointing Device Interface Test Error Codes

The 8600 Diagnostic error codes identifies failures with the pointing device (mouse, trackball, and so forth) or the system board assembly. Corrective action may require replacement of the pointing device or the system board assembly.

Table 3-19
Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing Device Interface test failed.	The following steps apply for 8601-xx error codes: 1. Replace with a working pointing device and retest. 2. Replace the system board and retest.

Drive Array Advanced Diagnostics (DAAD)

Drive Array Advanced Diagnostics (DAAD) is a DOS-based tool designed to run on all Compaq products containing a Compaq Drive Array Controller. The error messages and codes listed include all codes generated by Compaq products. Your system generates only those codes that are applicable to your configuration and options. The two main functions of DAAD are to collect all possible information about the array controllers in the system and to offer a list of all detected problems.

NOTE: : Refer to the *Drive Array Advanced Diagnostics User Guide* for complete details and procedures about this diagnostic tool.

DAAD works by issuing multiple commands to the array controllers to determine if a problem exists. This data can then be saved to a file and, for severe situations, this file can be sent to Compaq for analysis. In most cases, DAAD will provide enough information to initiate problem resolution immediately.

NOTE: : DAAD does not write to the drives or destroy data. It does not change or remove configuration information.

Starting DAAD

To start DAAD:

1. Insert the DAAD diskette into drive A.
2. Reboot the system - OR - if you are at the DOS prompt, enter the following:

   A:DAAD

NOTE: To generate a DAAD report without starting the interactive portion of the utility, enter the following at the DOS prompt:

DAAD *filename*

where *filename* is the name of the file or report.

3. A dialog box is displayed, indicating the version of DAAD installed. Press the **Enter** (or '**C**') key to continue, or press the **Esc** (or '**E**') key to exit without continuing.
4. If you continue, a Please Wait panel is displayed, indicating that DAAD is identifying the system parameters.

   DAAD gathers all the information it can from all of the array controllers in the system. The time it takes to gather this information depends on the size of your system.

   A second Please Wait panel may be displayed to indicate that the utility is identifying the ROM version of an array controller in the system.

CAUTION: Do not cycle the power because the utility must perform low-level operations that, if interrupted, could cause the controller to revert to a previous level of firmware if the firmware was soft-upgraded.

When the information gathering process is complete, the main DAAD screen is displayed.

NOTE: To generate a DAAD report without starting the interactive portion of the utility, enter the following at the DOS prompt:

DAAD *filename*

where *filename* is the name of the file or report.

Table 3-20 lists diagnostic messages in alphabetical order.

Table 3-20
DAAD Diagnostic Messages

Message	Description	Recommended Action
Accelerator board not detected	Array controller did not detect a configured array accelerator board.	Install array accelerator board on array controller. If an array accelerator board is installed, check for proper seating on the array controller board. You may need to run the System Configuration Utility and disable the array accelerator board to get this message off the screen.
Accelerator error log	List of the last 32 parity errors on transfers to or from memory on the array accelerator board. Displays starting memory address, transfer count, and operation (read and write).	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity read errors: n	Number of times that read memory parity errors were detected during transfers from memory on array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator parity write errors: n	Number of times that write memory parity errors were detected during transfers to memory on the array accelerator board.	If there are many parity errors, you may need to replace the array accelerator board.
Accelerator status: Permanently disabled	Array accelerator board has been permanently disabled. It will remain disabled until it is reinitialized using the System Configuration Utility.	Check the Disable Code field. Run the System Configuration Utility to reinitialize the array accelerator board.
Accelerator status: Possible data loss in cache	Possible data loss detected during power-up due to all batteries being below sufficient voltage level and no presence of the identification signatures on the array accelerator board.	There is no way to determine if dirty or bad data was in the cache and is now lost.
Accelerator status: Temporarily disabled	Array accelerator board has been temporarily disabled.	Check the Disable Code field.
Accelerator status: Unrecognized status	A status returned from the array accelerator board that DAAD does not recognize.	Obtain the latest version of DAAD.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Accelerator status: Valid data found at reset	Valid data was found in posted write memory at reinitialization. Data will be flushed to disk.	Not an error or data loss condition. No action needs to be taken.
Accelerator status: Warranty alert	Catastrophic problem with array accelerator board. Refer to other messages on Diagnostics screen for exact meaning of this message.	Replace the array accelerator board.
Adapter/NVRAM ID mismatch	EISA nonvolatile RAM has an ID for a different controller from the one physically present in the slot.	Run the System Configuration Utility.
Battery pack X below reference voltage	Battery pack on the array accelerator is below the required voltage levels.	Allow enough time for batteries to recharge (36 hours). If batteries have not recharged after 36 hours, replace the array accelerator board.
Battery X not fully charged	Battery is not fully charged.	If 75% of the batteries present are fully charged, the array accelerator is fully operational. If more than 75% of the batteries are **not** fully charged, allow 36 hours to recharge them.
Board not attached	Array controller configured for use with array accelerator board, but one is not attached.	Attach array accelerator board to array controller.
NVRAM configuration present, controller not detected	EISA nonvolatile RAM has a configuration for an array controller but there is no board in this slot. Either a board has been removed from the system or a board has been placed in the wrong slot.	Place the array controller in the proper slot or run the System Configuration Utility to reconfigure nonvolatile RAM to reflect the removal or new position.
Compatibility port problem detected	Compatibility port configured for this IDA controller. When DAAD was verifying this interface, a serious problem was detected.	A hardware problem has occurred; replace the IDA controller.
Configuration signature is zero	DAAD detected that nonvolatile RAM contains a configuration signature that is zero. Old versions of the System Configuration Utility could cause this.	Run the latest version of System Configuration Utility to configure the controller and nonvolatile RAM.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Configuration signature mismatch	Array accelerator board configured for a different array controller board. Configuration signature on array accelerator board does not match the one stored on the array controller board.	To recognize the array accelerator board, run the System Configuration Utility.
Controller communication failure occurred	Controller communication failure occurred.	DAAD was unable to successfully issue commands to the controller in this slot.
Controller detected. NVRAM configuration not present	EISA nonvolatile RAM does not contain a configuration for this controller.	Run the System Configuration Utility to configure the nonvolatile RAM.
Controller firmware needs upgrading	Controller firmware is below the latest recommended version.	Run Options ROMPaq to upgrade the controller to the latest firmware revision.
Controller firmware needs upgrading (DAAD Error 102)	Controller is correct, however, IDA firmware version should be greater than 1.26.	Obtain the latest firmware.
Controller is located in special "video" slot	Controller is installed in slot for special video control signals. If controller is used in this slot, LED indicators on front panel may not function properly.	Install the controller in a different slot and run the System Configuration Utility to configure the controller and nonvolatile RAM.
Controller is not configured	Controller is not configured. If controller was previously configured and you change drive locations, there may be a problem with placement of the drives. DAAD examines each physical drive and looks for drives that have been moved to a different drive bay.	Look for messages indicating which drives have been moved. If none appear and drive swapping did not occur, run the System Configuration Utility to configure the controller and nonvolatile RAM. **Do not** run the System Configuration Utility if you believe drive swapping has occurred.
Controller needs replacing (DAAD Error 102)	IDA firmware is less than version 0.96.	Replace the controller as soon as possible.
Controller needs replacing (DAAD Error 104)	The Intelligent Array Expansion System firmware is less than version 1.14.	Replace the controller as soon as possible.
Controller reported POST error. Error Code: x	The controller returned an error from its internal Power-On Self Tests.	Replace the controller.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Controller restarted with a signature of zero	DAAD did not find a valid configuration signature to use to get the data. Nonvolatile RAM may not be present (unconfigured) or the signature present in nonvolatile RAM may not match the signature on the controller.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
DAAD recorded errors attempting to access: X	DAAD found errors while attempting to access physical drive X, believed to be operational. Message followed by specific information about the error.	Replace the drive, or correct the condition that caused the error.
Disable command issued	Posted writes have been disabled by the issuing of the Accelerator Disable command. This occurred because of an operating system device driver.	Restart the system. Run the System Configuration Utility to reinitialize the array accelerator board.
Drive (bay) X needs replacing (DAAD Error 102)	The 210-megabyte hard drive has firmware version 2.30 or 2.31.	Replace the drive.
Drive Monitoring features are unobtainable	DAAD unable to get monitor and performance data due to fatal command problem such as drive time-out, or unable to get data due to these features not supported on the controller.	Check for other errors (time-outs, etc.). If no other errors occur, upgrade the firmware to a version that supports monitor and performance, if desired.
Drive Monitoring is NOT enabled for drive bay X	The monitor and performance features have not been enabled.	Run the System Configuration Utility to initialize the monitor and performance features.
Drive time-out occurred on physical drive bay X	DAAD issued a command to a physical drive and the command was never acknowledged.	The drive or cable may be bad. Check the other error messages on the Diagnostics screen to determine resolution.
Drive (bay) X firmware needs upgrading	Firmware on this physical drive is below the latest recommended version.	Run the Options ROMPaq Utility to upgrade the drive firmware to the latest revision.
Drive (bay) X has invalid M&P stamp	Physical drive has invalid monitor and performance data.	Run the System Configuration Utility to properly initialize this drive.
Drive X indicates position Y	Message indicates which physical drive appears to be scrambled or in a drive bay other than the one for which it was originally configured.	Examine the graphical drive representation on DAAD to determine proper drive locations. Remove drive X and place it in drive position Y. Rearrange the drives according to the DAAD instructions.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Drive (bay) X RIS copy mismatch	The copies of the RIS on this drive do not match.	This drive may need to be replaced. Check for other errors.
Drive (bay) X upload code not readable	An error occurred while DAAD was trying to read the upload code information from this drive.	If there were multiple errors, this drive may need to be replaced.
Duplicate write memory error	Data could not be written to the array accelerator board in duplicate due to the detection of parity errors. This is not a data loss situation.	Replace the array accelerator board.
Error occurred reading RIS copy from drive (bay) X	An error occurred while DAAD was trying to read the RIS from this drive.	If there were multiple errors, this drive may need to be replaced.
FYI: Drive (bay) X is non-Compaq supplied	The installed drive was not supplied by Compaq.	If problems exist with this drive, replace it with a Compaq drive.
Identify controller data did not match with NVRAM	The identify controller data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured. It could also occur if the firmware on the controller has been upgraded and the System Configuration Utility was not run.	Check the identify controller data under the Inspect Utility. If the firmware version field is the only thing different between the controller and nonvolatile RAM data, this is not a problem. Otherwise run the System Configuration Utility.
Identify logical drive data did not match with NVRAM	The identify unit data from the array controller did not match with the information stored in nonvolatile RAM. This could occur if new, previously configured drives have been placed in a system that has also been previously configured.	Run the System Configuration Utility to configure the controller and nonvolatile RAM.
Insufficient adapter resources	The adapter does not have sufficient resources to perform operations to the array accelerator board. Drive rebuild may be occurring.	Operate the system without the array accelerator board until the drive rebuild completes.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Less than 75% batteries at sufficient voltage	The operation of the array accelerator board has been disabled due to less than 75% of the battery packs being at the sufficient voltage level.	Allow sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the array accelerator board.
Logical drive X failed due to cache error	This logical drive failed due to a catastrophic cache error.	Replace the array accelerator board and reconfigure using the System Configuration Utility.
Logical Drive X status = FAILED	This status could be issued for several reasons. If this logical drive is configured for No Fault Tolerance and one or more drives fail, this status will occur. If mirroring is enabled, and any two mirrored drives fail, this status will occur. If Data Guarding is enabled, and two or more drives fail in this unit, this status will occur. This status may also occur if another configured logical drive is in the WRONG DRIVE REPLACED or LOOSE CABLE DETECTED state.	Check for drive failures, wrong drive replaced, or loose cable messages. If there was a drive failure, replace the failed drive(s) and then restore the data for this logical drive from the tape backup. Otherwise, follow the wrong drive replaced or loose cable detected procedures.
Logical Drive X status = INTERIM RECOVERY	A physical drive in this logical drive has failed. The logical drive is operating in interim recovery mode and is vulnerable.	Replace the failed drive as soon as possible.
Logical Drive X status = LOOSE CABLE DETECTED	A physical drive has a cabling problem.	Turn the system off and attempt to reattach the cable onto the drive. If this does not work, replace the cable.
Logical Drive X status = NEEDS RECOVER	A physical drive in this logical drive has failed and has now been replaced. This drive needs to be rebuilt from the mirror drive or the parity data.	When booting up the system, select the "F1 - rebuild drive" option to rebuild the replaced drive.
Logical Drive X status = OVERHEATED	The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels and it has shut down to avoid damage.	Check the fans and the operating environment.
Logical Drive X status = OVERHEATING	The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels.	Check the fans and the operating environment.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Logical Drive X status = RECOVERING	A physical drive in this logical drive has failed and has now been replaced. The replaced drive is rebuilding from the mirror drive or the parity data.	Nothing needs to be done. Normal operations can occur.
Logical Drive X status = WRONG DRIVE REPLACED	A physical drive in this logical drive has failed. The incorrect drive was replaced.	Replace the drive that was incorrectly replaced. Then, replace the original drive that failed with a new drive. Do not run the System Configuration Utility to reconfigure; you will lose data on the drive.
Loose cable detected - logical drives may be marked FAILED until corrected	Controller unable to communicate with one or more physical drives, probably because of a cabling problem. Logical drives may be in a FAILED state until the condition is corrected, preventing access to data on the controller.	Check all controller and drive cable connections.
Mirror data miscompare	Data was found at reinitialization in the posted write memory; however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.	Replace the array accelerator board.
Mirrored memory location errors	Soft errors occurred when attempting to read the same data from both sides of the mirrored memory. Data loss will occur.	Replace the array accelerator board.
No configuration for Accelerator Board	The array accelerator board has not been configured.	If the array accelerator board is present, run the System Configuration Utility to configure the board, if desired.
Drive (bay) X has loose cable	The array controller could not communicate with this drive at power-up. This drive has not previously failed.	Check all cable connections first. The cables could be bad, loose, or disconnected. Turn on the system and attempt to reconnect data/power cable to the drive. If this does not work, replace the cable. If that does not work, the drive may need to be replaced.
Drive (bay) X is a replacement drive	This drive has been replaced. This message displays if a drive is replaced in a fault tolerant logical volume.	If the replacement was intentional, allow the drive to rebuild.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Drive (bay) X is a replacement drive marked OK	This drive has been replaced and marked OK by the firmware. This may occur if a drive has an intermittent failure (for example, if a drive has previously failed, then when DAAD is run, the drive starts working again).	Replace the drive.
Drive (bay) X failed	The indicated physical drive has failed.	Replace this drive.
Drive (bay) X has insufficient capacity for its configuration	Drive has insufficient capacity to be used in this logical drive configuration.	Replace this drive with a larger capacity drive.
Drive (bay) X is undergoing drive recovery	This drive is being rebuilt from the corresponding mirror or parity data.	Normal operations should occur.
Drive (bay) X was inadvertently replaced	The physical drive was incorrectly replaced after another drive failed.	Replace the drive that was incorrectly replaced and replace the original drive that failed. Do not run the System Configuration Utility and try to reconfigure; data will be lost.
SCSI port X, drive ID Y firmware needs upgrading	Drive's firmware may cause problems and should be upgraded.	Run Options ROMPaq to upgrade the drive's firmware to a later revision.
Set configuration command issued	The configuration of the array controller has been updated. The array accelerator board may remain disabled until it is reinitialized.	Run the System Configuration Utility to reinitialize the array accelerator board.
Soft Firmware Upgrade required	DAAD has determined that your controller is running firmware that has been soft upgraded by the Compaq Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system.	Run the Compaq Upgrade Utility to place the latest firmware on all drives.
Threshold for drive (bay) X violated	This message indicates that a monitor and performance threshold for this drive has been violated.	Check for the particular threshold that has been violated.
Threshold violations for drive (bay) X	This is a list of the individual thresholds that have been violated for this drive.	The drive may need to be replaced. Run the Compaq Diagnostics Utility to determine if the drive has been initialized and the threshold violation warrants drive replacement.

Continued

DAAD Diagnostic Messages *Continued*

Message	Description	Recommended Action
Unknown disable code	A code was returned from the array accelerator board that DAAD does not recognize.	Obtain the latest version of DAAD.
Warning bit detected	A monitor and performance threshold violation may have occurred. The status of a logical drive may not be OK.	Check the other error messages for an indication of the problem.
WARNING - Drive Write Cache is enabled on X	Drive has its internal write cache enabled. The drive may be a third-party drive or the drive's operating parameters may have been altered. Condition may cause data corruption if power to the drive is interrupted.	Replace the drive with a Compaq supplied drive, or restore the drive's operating parameters.
Wrong Accelerator	This could mean that either the board was replaced in the wrong slot or placed in a system that was previously configured with another board type. Included with this message is a message indicating the type of adapter sensed by DAAD and a message indicating the type of adapter last configured in EISA nonvolatile RAM.	Check the diagnosis screen for other error messages. Run the System Configuration Utility to update the system configuration.

Rapid Recovery Services

Compaq servers provide rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery.

Rapid recovery means fast identification and resolution of complex faults. The Rapid Recovery Engine and Insight Management Agents notify the system administrator when a failure occurs, ensuring that the server experiences minimal downtime. You enable these features through the System Configuration Utility. These integrated server management features are:

- Automatic Server Recovery-2 (ASR-2)
- Server Health Logs
- Storage Fault Recovery Tracking
- Storage Automatic Reconstruction
- Network Interface Fault Recovery Tracking
- Memory Fault Recovery Tracking (with option upgrade kit)

These are discussed in more detail on the Systems Reference Library CD (SRL).

Automatic Server Recovery-2

Automatic Server Recovery-2 (ASR-2) lets the server restart automatically from the operating system or the Compaq Utilities. To use this feature, you must use the System Configuration Utility to install Compaq Utilities in the system partition.

You can tell ASR-2 to restart your server after a critical hardware or software error occurs. Using the Compaq System Configuration Utility, configure the system for either automatic recovery or for attended local or remote access to diagnostic and configuration tools.

You can also configure ASR-2 to page an administrator when the system restarts. ASR-2 depends on the application and driver that routinely notify the ASR-2 hardware of proper system operations. If the time between ASR-2 notifications exceeds the specified period, ASR-2 assumes a fault has occurred and initiates the recovery process.

To configure ASR-2, follow this procedure:

1. Execute the System Configuration Utility.
2. Select *View and Edit Details*.
3. Set the software error recovery status to Enabled.
4. Set the software error recovery time-out.

The available recovery features are:

- **Software Error Recovery** – automatically restarts the server after a software-induced server failure
- **Environmental Recovery** – allows the server to restart when temperature, fan, or AC power conditions return to normal

Unattended Recovery

For unattended recovery, ASR-2 logs the error information to the Critical Error Log, resets the server, pages you (if a modem is present and you selected paging), and tries to restart the operating system. Often the server restarts successfully, making unattended recovery the ideal choice for remote locations where trained service personnel are not immediately available.

ASR-2 tries to restart the server up to 10 times. If ASR-2 cannot restart the server within 10 attempts, it places a critical error in the Critical Error Log, starts the server into Compaq Utilities, and enables remote access (if you configured remote access).

To use this level of ASR-2, you must configure ASR-2 to load the operating system after restart.

Attended Recovery

For attended recovery, ASR-2 takes the following actions:

- Logs the error information to the Critical Error Log
- Resets the server
- Pages you (if a modem is present and you selected Paging)
- Starts Compaq Utilities from the hard drive
- Enables remote access

During system configuration, these utilities are placed on the system utilities partition of the hard drive.

If you have configured for dial-in access and have a modem with an auto-answer feature installed, you can dial in and remotely diagnose or reconfigure the server.

If you have configured the Compaq Utilities for network access, you can access the utilities over the network. You can use Compaq Insight Manager for dial-in or network access.

Hardware Requirements

To use this level of ASR-2 over a modem, you need the following:

- Compaq modem or optional Hayes modem
- System Configuration Utility and Diagnostics Utility installed on the system partition of the hard drive
- ASR-2 configured to load Compaq Utilities after restart

You may also run Compaq Utilities remotely over an IPX or IP network using the Network feature:

- To use Compaq Utilities on an IPX network, you must have Compaq Insight Manager 2.0 or later or an NVT (Novell Virtual Terminal) Terminal Emulator with VT100 or ANSI terminal capabilities.
- To use Compaq Utilities on an IP network, you must have Compaq Insight Manager 2.10 or later, or a Telnet Terminal Emulator with VT100 or ANSI capabilities.

If you are notified that ASR-2 restarted the server and you have restarted to Compaq Utilities, use the Inspect Utility or Compaq Insight Manager to view the critical error in the Critical Error Log. Run Diagnostics to diagnose and resolve the problem.

You can configure ASR-2 to restart the server into Compaq Utilities to diagnose the critical error, or to start the operating system to return the server to operational status as rapidly as possible.

When you enable ASR-2 to start the operating system, the server tries to start from the primary partition. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access Compaq Utilities.

When you enable ASR-2 to start Compaq Utilities, your server restarts after a critical error and loads Compaq Utilities from the system partition on the hard drive.

You can configure your server to start Compaq Utilities in four different ways:

- Without remote console support; for example, to run Compaq Utilities from the server console only
- With remote console support using modems for dial-in access
- With remote console support using a modem to dial a predetermined telephone number
- With remote console support through a network connection (IP or IPX)

Compaq Integrated Remote Console

The standard Compaq Integrated Remote Console performs a wide range of configuration activities. Some of the console's features include

- Accessible using ANSI terminal
- Operates independently of the operating system
- Provides for remote server reboot
- Provides access to system configuration
- Uses out-of-band communication with dedicated management modem installed in the server

For more information, see the *Integrated Remote Console User Guide*.

IMPORTANT: Before configuring ASR-2, verify that the System Configuration Utility and Diagnostics software are installed on the system partition. ASR-2 must have this to start Compaq Utilities after a system restart. Compaq recommends this even if you configure ASR-2 to start the operating system.

Compaq Health Driver

The Compaq Health Driver resets the ASR-2 timer according to the frequency you specified in the System Configuration Utility (for example, 10 minutes). If the ASR-2 timer counts down to zero before being reset, ASR-2 restarts the server into either Compaq Utilities or the operating system (as indicated by the System Configuration parameters). The default value is 10 minutes. The allowable settings are 5, 10, 20, and 30 minutes

For remote and off-site (unattended) servers, setting the software error recovery time-out for 5 minutes reduces the server downtime and allows the server to recover quickly. For local (attended) servers located on site, you can set the software error recovery time-out for 20 or 30 minutes, giving you time to arrive at the server and diagnose the problem.

The Compaq Health Driver is independent of the ASR-2 timer. You can load it without enabling the ASR-2 timer. This allows the driver to log information in the Server Health Logs without restarting the server if a critical error occurs. However, you cannot enable the ASR-2 timer without loading the Compaq Health Driver.

The following ASR-2 flow chart shows you the sequence of events after a hardware or software error occurs:

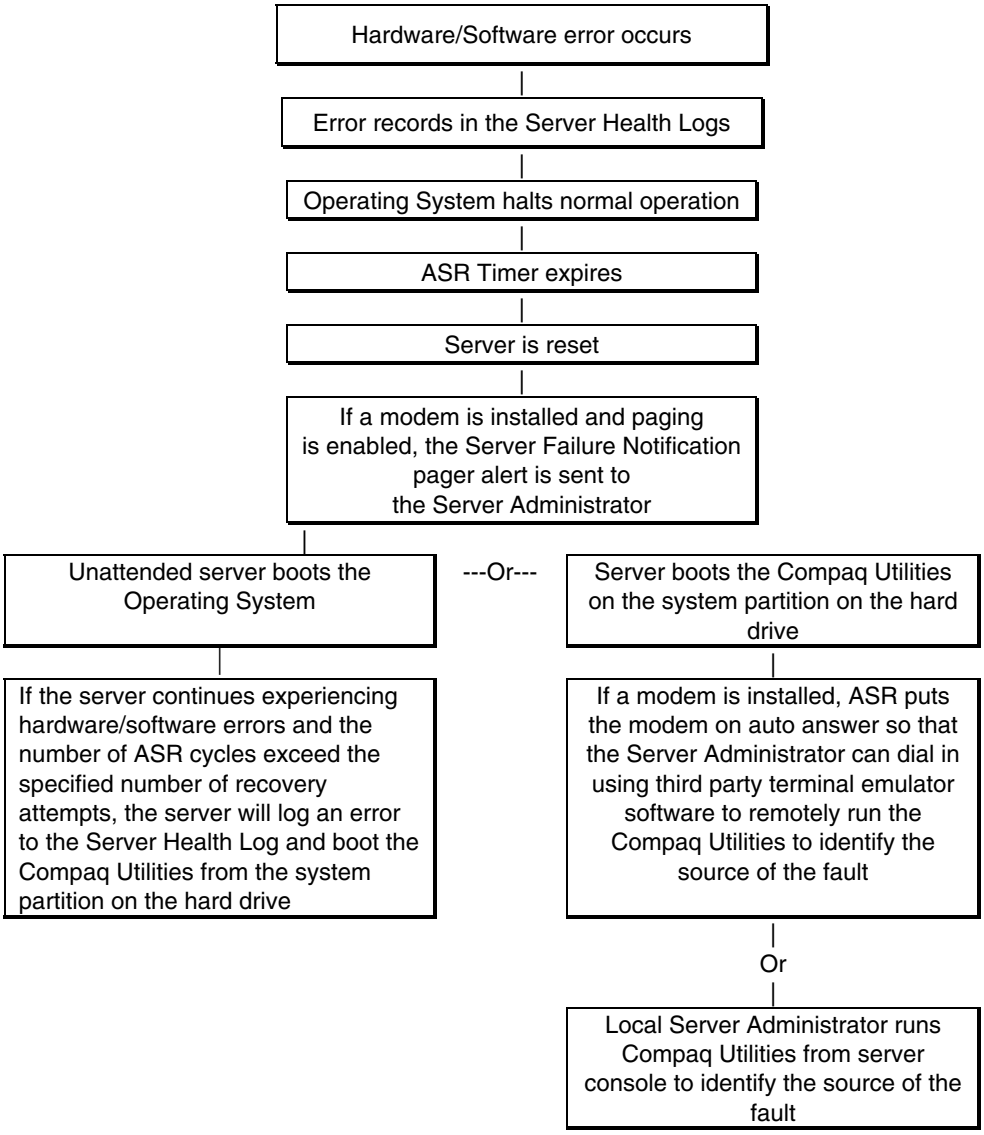

Figure 3-1. ASR-2 Flow Chart

Booting into Compaq Utilities

When you enable ASR-2 to start into Compaq Utilities and a critical error occurs, the operating-system-specific Health Driver logs the error information in the Critical Error Log and the ASR-2 feature restarts the server. When the system reinitializes, the system pages the designated administrator (if enabled), and starts Compaq Utilities from the hard drive

If Dial-In status is enabled, the modem is placed in auto-answer mode. If you enable Dial-Out status, you are automatically enabled for Dial-In.

If Network Status is enabled, the appropriate network support software is loaded, depending on the network protocol, IP or IPX. This allows remote access via the network.

IMPORTANT: Compaq Utilities are loaded from a specially created system partition on the hard drive. This partition was configured during server configuration.

You can access the server and view the Server Health Logs remotely by modem, in-band over the network, or directly from the server. For modem access, you must have either Compaq Insight Manager 2.0 or above or have a VT100 or ANSI terminal type device. You may use a standard CRT with VT100 or ANSI emulation capability, or you may use a PC with a VT100 or ANSI terminal emulation package. The communication parameters must be set for 8 data bits, no parity, and 1 stop bit.

You can also enable ASR-2 to allow network access using the Network Status feature in the System Configuration Utility. You must have either Compaq Insight Manager 2.0 or greater or a Novell Virtual Terminal (NVT) emulator on an IPX network to use this feature. You must also have version 2.24 or later of the System Configuration Utility. For IP access, you must have either Compaq Insight Manager 2.10 or later, or a Telnet Terminal emulator to use this feature. You also must have version 2.24 or later of the System Configuration Utility.

The System Configuration Utility settings should resemble the settings in the following table when you enable ASR-2 to start into Compaq Utilities.

Table 3-21
Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities

Pager Data	Setting	Description
Pager status	Enabled	Indicates if the pager feature is enabled or disabled.
Pager dial string	ATDT 555-5555	Indicates the pager dial string and delay before the pager message. Pagers typically use one of the following formats: Local pagers: ATDT 555-5555 Wide area pagers: ATDT 1-800-555-5555,1234567#
Pager message	1234567#	Represents a unique number (maximum seven digits, numeric only) that you must designate to identify the server on your pager display. The ROM adds a three-digit code to the front of this number. The first two indicate the subsystem and the third indicates the severity of the error that caused the alert. The # symbol usually terminates the message. If no message is required, delete the # symbol.
Pager test	Select to test pager setup	Use this to test the current pager settings. Press Enter to dial the pager number, and the pager message (if present) displays. You must configure the computer before testing the pager and the Pager Status must be set to Enabled. Do not test the pager if you are running remotely and are using only one modem.
Serial interface	COM1	Select the communications port for the modem used by the pager and the remote ASR-2 functions. The options are COM1 and COM2.
Dial-in status	Enabled	Set Dial-In Status to Enabled. Be sure the Reset Boot option is set to Boot Compaq Utilities. When the system starts because of an ASR reset, it starts to the Compaq Utilities, sets the Management Modem to auto-answer, and waits for the administrator to dial in and run the Compaq Utilities. You automatically disable this option when you configure the software error recovery start option to Boot Operating System. When ASR pages you, you cannot dial in unless ASR-2 exceeds 10, the threshold number of server restart retries. When this happens, ASR-2 restarts the server into the Compaq Utilities and places the modem in auto-answer mode.

Continued

Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities *Continued*

Pager Data	Setting	Description
Dial-out status	Enabled	Allows ASR-2 to dial out to a remote workstation. If you selected this option, Dial In Status is automatically selected. To use the dial-out feature, set Dial-Out Status to Enabled and set the Dial-Out String to the correct phone number. You must also set the Reset Boot option to Boot Compaq Utilities. When the system restarts because of an ASR reset, the administrator is paged via Pager Status and Pager Dial String, the system restarts to the Compaq Utilities, and dials out to the phone number provided in the Dial-Out string. The dial-out number will be tried five times. If it fails to connect after five attempts, the modem is put in auto-answer mode.
Dial-out string	555-1234	Enter the dial string followed by the remote computer's telephone number.
Network status	Enabled	To allow network access to Compaq Utilities, set Network Status to Enabled and make sure the Reset Boot option is set to Boot Compaq Utilities.
Network protocol		To use IPX network access, set Network Protocol to IPX. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IPX network support. This enables remote access via NVT. To use IP network access, set Network protocol to IP. Also make sure to set Network IP address, Network IP net mask, and Network IP router address. When the system restarts to the Compaq Utilities because of an ASR reset, it loads IP network support. This enables remote access via Telnet. **NOTE:** The Network Status must be set to Enabled for network access.
Network controller	Compaq	For all Compaq Standard Network Controllers.
Network host name	CPQHOU	Enter the network name of the server. Use underscores instead of spaces within the name, for example, Compaq_Server. If you are using IPX network access to the Compaq Utilities, this server name is used to advertise NVT host services. This server name displays in the Compaq Insight Manager server list when it determines it can communicate via NVT. Set this name to be the same as the server name you assign when the host OS is running.
Network card slot	Slot #	Select the slot number of the network interface card you wish to use for network access to Compaq Utilities.
Network frame type	ETHERNET_II	Select the frame type for your network. Selections include both Ethernet and Token Ring topologies.

Continued

Compaq System Configuration Utility Pager Settings for Booting into Compaq Utilities *Continued*

Pager Data	Setting	Description
Network IP address		Enter the IP address for this server in standard dot notation. **NOTE:** This is not used if you select Custom for Network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.
Network IP net mask		Enter the net mask for this server in standard dot notation. **NOTE:** This is not used if you select Custom for network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.
Network IP router address		Enter the router to be used for this server in standard dot notation. **NOTE:** This is not used if you select Custom for network controller. You must enter your IP address in the NET. CFG file that you load into the system partition.

If you configure the server to boot into Compaq Utilities, the server prepares for remote communications, so you can remotely run Diagnostics software, Inspect Utility, or System Configuration Utility using a workstation running terminal emulation software, such as Compaq Insight Manager or PC Anywhere.

Booting into the Operating System

When you enable ASR-2 to restart into the operating system and a critical error occurs, ASR-2 logs the error in the Critical Error Log and restarts the server. The system ROM pages the designated administrator, and executes the normal restart process.

IMPORTANT: When you enable ASR-2 to restart into the operating system, Modem Dial-In Status, Network Status, and Modem Dial-Out Status are automatically disabled. In this mode, ASR-2 can page you if a critical error occurs, but you cannot access the server, and the server cannot dial out to a remote workstation.

During the recovery process, the ASR-2 feature tries to restart the server up to 10 times. If the ASR-2 feature cannot restart the server within 10 attempts, it logs a critical error in the Critical Error Log, restarts the server into the Compaq Utilities, and puts the modem into auto-answer mode.

Your System Configuration Utility setting should resemble the following when you enable ASR to restart into the operating system:

- Serial interface — COM1
- Dial-in status — Disabled
- Dial-out status — Disabled
- Dial-out string — 555-1234
- Network status — Disabled
- Network protocol — IPX
- Network controller — Compaq
- Network host name — CPQHOU
- Network card slot — Slot #
- Network frame type — ETHERNET_II
- Network IP address — xxx.xxx.xxx.xxx
- Network IP net mask — xxx.xxx.xxx.xxx
- Network IP router address — xxx.xxx.xxx.xxx

ASR-2 Security

The standard Compaq password features function differently during ASR-2 than during a typical system startup.

During ASR-2, the system does not prompt for the Power-On Password. This allows the ASR-2 to restart the operating system or Compaq Utilities without user intervention.

To maintain system security, set the server to boot in Network Server Mode (an option in the System Configuration Utility). This option ensures that the server keyboard is locked until you enter the Keyboard Password.

Select an Administrator Password (an option in the System Configuration Utility). During attended ASR-2 (local or remote), you must enter this Administrator Password before any modifications can be made to the server configuration.

Server Health Logs

The Server Health Logs contain information to help identify and correct any server failures and correlate hardware changes with server failure. The Server Health Logs are stored in nonvolatile RAM and consist of the Critical Error Log and the Revision History Table.

If errors occur, information about the errors is automatically stored in the Critical Error Log.

Whenever boards or components (that support revision tracking) are updated to a new revision, the Revision History Table will be updated.

Critical Error Log

The Critical Error Log records memory errors as well as catastrophic hardware and software errors that cause the system to fail. This information helps you quickly identify and correct the problem, thus minimizing downtime.

You can view the Critical Error Log through the Inspect Utility, Diagnostics Utility, or Compaq Insight Manager. The Diagnostics Utility either resolves the error or suggests corrective action.

The Critical Error Log identifies and records all the following errors. Each error type is briefly explained below. If you encounter any of these errors, run the Diagnostics Utility.

Table 3-22
Critical Error Log Messages

Message	Description
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Server Recovery-2 (ASR-2) timer expiration.
Automatic Server Recovery Extended Memory Parity Error	The system detected a data error in extended memory following a reset due to the ASR-2 timer expiration.
Automatic Server Recovery Memory Parity Error	The system ROM was unable to allocate enough memory to create a stack. Then, it was unable to put a message on the screen or continue booting the server.

Continued

Critical Error Log Messages *Continued*

Message	Description
Automatic Server Recovery Reset Limit Reached	The maximum number of system resets due to ASR-2 timer expiration has been reached, resulting in the loading of Compaq Utilities.
Battery Failing	Low system battery warning. Replace battery within 7 days to prevent loss of nonvolatile configuration memory. Failure of the battery supporting the system's nonvolatile RAM is imminent.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Diagnostic Error	An error was detected by the Diagnostics Utility. See the specific error code in this chapter for a detailed explanation.
Error Detected On Boot Up	The server detected an error during the Power-On Self-Test (POST).
Processor Prefailure	A CPU has passed an internal corrected error threshold; excessive internal ECC cache errors .
NMI - PCI Bus Parity Error	A parity error was detected on the PCI bus.
NMI - Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a server failure.
NMI - Expansion Bus Master Time-Out	A bus master expansion board in the indicated slot did not release the bus after its maximum time, resulting in a server failure.
NMI - Expansion Bus Slave Time-Out	A board on the expansion bus delayed a bus cycle beyond the maximum time, resulting in a server failure.
NMI - Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a server failure.
Processor Exception	The indicated processor exception occurred.
NMI - Processor Parity Error	The processor detected a data error, resulting in a server failure.
Server Manager Failure	An error occurred with the Server Manager/R.
NMI - Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a server failure.
Caution: Temperature Exceeded	The operating system has detected that the temperature of the system has exceeded the caution level. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
Abnormal Program Termination	The operating system has encountered an abnormal situation that has caused a system failure.
ASR-2 Test Event	The System Configuration Utility generated a test alert.
NMI- Automatic Server Recovery Timer Expiration	The operating system has received notice of an impending ASR-2 timer expiration.

Continued

Critical Error Log Messages *Continued*

Message	Description
Required System Fan Failure	The required system fan has failed. Accompanying data in the log notes if an auto-shutdown sequence has been invoked by the operating system.
UPS A/C Line Failure Shutdown or Battery Low	The UPS notified the operating system that the AC power line has failed. Accompanying data indicates if an auto-shutdown sequence has been invoked or if the battery has been nearly depleted.
ASR-2 detected by ROM	An ASR-2 activity has been detected and logged by the system ROM.

Revision History Table

Some errors can be resolved by reviewing changes to the server's configuration. The server has an Automatic Revision Tracking (ART) feature that helps you review recent changes to the server's configuration.

One ART feature is the Revision History Table, which contains the hardware version number of the system board and any other system boards providing ART-compatible revision information. This feature lets you determine the level of functionality of an assembly in a system without opening or powering down the unit.

Table 3-23
Revision History Format

Current Revisions	
Data	10/31/95
System Board Revision	03
Assembly Version	1
Functional Revision Level	C
Processor 01 Revision	01
Assembly Version	1
Functional Revision Level	A

Continued

Revision History Format *Continued*

Previous Revisions	
Date	9/21/95
System Board Revision	03
Assembly Version	1
Functional Revision Level	C
Processor 01 Revision	01
Assembly Version	1
Functional Revision Level	A

The Revision History Table is stored in nonvolatile RAM and is accessed through Diagnostics Utility, Inspect Utility, and Compaq Insight Manager.

Storage Fault Recovery Tracking

This feature tracks over 12 failure indication parameters, such as time-outs, spin-up and self-test errors of SCSI drives. You can use these parameters to pinpoint failed storage subsystem components and to recover from controller or hard drive failure.

Storage Automatic Reconstruction

This feature automatically reconstructs data to an online spare or to a replaced drive if a drive fails. To use the reconstruction feature, you must configure your server for drive mirroring or data guarding. The reconstruction decreases system downtime by allowing rapid recovery to full system operation if a drive fails.

Network Interface Fault Recovery Tracking

This feature tracks over 20 failure-indication parameters, such as alignment errors, lost frames, and frame copy errors, of Ethernet and Token Ring network interfaces. It decreases network downtime by enabling diagnosis of actual network interface failures.

Memory Fault Recovery Tracking

This feature inspects the operation of the memory subsystem looking for uncorrectable memory errors.

Remote Service Features

Compaq servers have the following management features that you can access by modem or network:

Table 3-24
Compaq Servers Remote Management Features

Feature	Description
Service Session	Provides remote access to all the utilities on the system partition, including Diagnostics utilities, Inspect, ROMPaq, Drive Array Advanced Diagnostics (DAAD), and the System Configuration Utility. Also provides the capability for remote file transfer services to and from the system partition.
Disk-Based Diagnostics	Provides remote diagnostic capability after you configure ASR-2 and the reset restart option to restart from Compaq Utilities. Also allows you to view Health Logs. Disk-based diagnostics can also be run locally. Press **F10** during the restart process when the cursor moves to the upper-right corner of the monitor.
Server Restart	Provides the ability to restart the server remotely from Compaq Insight Manager while the operating system is running. Allows the server to restart back to the operating system or restart to the system partition. Provides a complete system reset to all peripherals. If you select Boot to Compaq Utilities from Compaq Insight Manager, Compaq Utilities loads the appropriate remote services so that remote access is available. If network status is enabled, network support is loaded. If Dial-In status is enabled, the modem is set to auto-answer.
Configuration Utility	Allows you to run the System Configuration Utility remotely. You can also run the remote configuration utility locally. Press **F10** during the restart process when the cursor moves to the upper-right corner of the monitor.
Firmware Updates	Allows you to update the server's firmware remotely. Uses firmware images on the system partition that might have been previously uploaded with the file transfer services.

ROMPaq

Using flash ROM in Compaq servers allows the firmware (BIOS) to be upgraded with system or option ROMPaq utilities. To upgrade the ROM:

- Run the ROMPaq utility from the system partition, or
- Insert a ROMPaq diskette into drive A and cold boot the system.

The ROMPaq utility then checks the system and provides a choice (if more than one exists) of ROM revisions to which the system can be upgraded. This procedure is the same for both system and option ROMPaq utilities.

CAUTION: Do not turn the power off during a firmware upgrade. A loss of power during upgrade may corrupt the firmware and prevent the system from booting.

Compaq Insight Manager

Compaq Insight Manager is the Compaq application for easily managing network devices. Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your servers.

Features of Compaq Insight Management

Compaq Insight Management features include:

- Comprehensive Fault Management - For all major subsystems, including pre-failure alerting for disks, memory, and Pentium Pro processors.
- Integration Management - In conjunction with SmartStart, allows you to effectively deploy and manage configurations throughout the enterprise using the Integration Server and Insight Version Control.
- Performance Management - Sets performance and capacity thresholds for management variables related to CPU and bus utilization, NIC throughput, logical disk capacity, and more
- Workstation Management - Monitors and manages Compaq Professional Workstations.
- Client Management - Manages faults and assets on Compaq Deskpro computers
- Netelligent Management - Receives alarms from Netelligent devices. Full management of Netelligent devices is supported through integration with Compaq Netelligent Management Software

- Asset Management - Exports asset information from the Compaq Insight Manager database to leading database and spreadsheet applications
- Remote Management - Manages in-band or out-of-band devices, on-line or off-line, from anywhere
- Reporting - Using Automatic Data Collection, gathers historic performance information for graphing or export purposes.
- Integration with Enterprise Management Platforms - Provides integration with leading management platforms including HP OpenView, IBM NetView, SunNet Manager, and Microsoft Systems Management Server.

Compaq Insight Management Software Architecture

The Compaq Insight Management software architecture is typical of other network management solutions. It has a client/server architecture and is composed of agent software (Compaq Insight Management Agents) and the management application software (Compaq Insight Manager).

Insight Management Agents

Insight Agents operate on Compaq systems (such as servers and workstations), performing in-depth monitoring of the system's state by collecting and measuring system parameters. These parameters indicate the current state of subsystems by counting the occurrence of particular events (for example, the number of read operations performed on a disk drive) or monitoring the state of a critical function (such as whether or not the cooling fan is operating).

Insight Desktop Agents operate on Compaq Deskpro computers monitoring functions that include temperature sensing and disk pre-failure alerting.

Insight Agents provide information to management applications such as Compaq Insight Manager and can generate alarm notifications if significant changes occur in the fault or performance aspects of system operation. Information is delivered to and from the Insight Agents by the industry-standard Simple Network Management Protocol or SNMP.

Compaq Insight Manager

Compaq Insight Manager delivers intelligent monitoring and alerting as well as visual control of your Compaq hardware. In the unlikely event of hardware failures, Compaq Insight Manager also provides a full complement of remote maintenance and control facilities.

For additional information, refer to the online *Compaq Insight Manager User Guide* on the Systems Reference Library CD that accompanied your server.

Chapter 4
Switches and Jumpers

This chapter provides switch and jumper information for the Compaq ProLiant 850R Servers.

System Board

The Compaq ProLiant 850R Server system boards contain the system maintenance switchbank and the external battery jumper.

Switch SW1 - System Maintenance Switchbank

Switch SW1 is an eight-position switchbank (S1-S8) that controls the security features and maintenance of the computer.

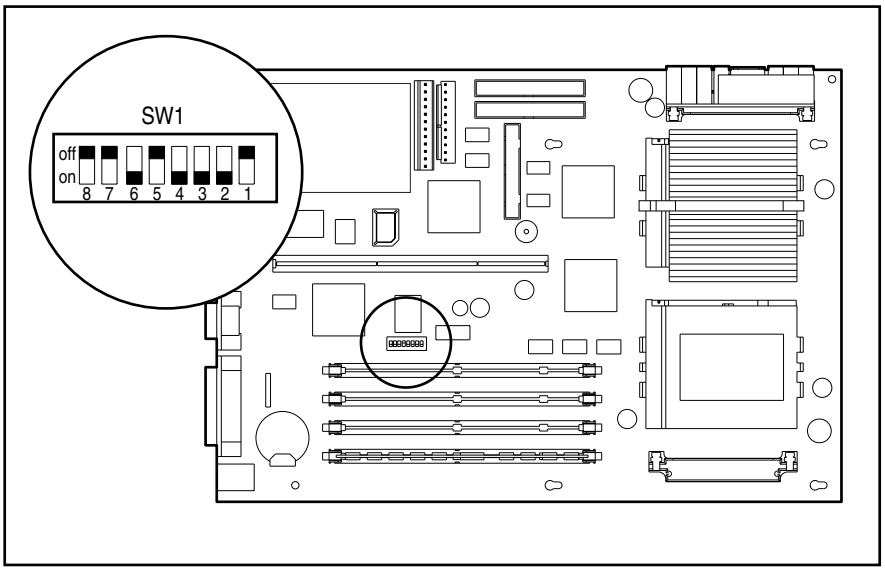

Figure 4-1. Location of the System Board Switch SW1

The following table defines the function for each switch setting of SW1. The default positions are indicated below.

Table 4-1
System Maintenance Switch Settings - SW1

Switch	Function	Set to ON	Set to OFF
1	Power-On Password Defeat	Enabled. Permanently clears all system passwords. For new passwords, turn switch off and run System Configuration Utility.	Default. Disabled.
2	Reserved - ON *	Factory use only.	Factory use only.
3	Reserved - ON *	Factory use only.	Factory use only.
4	Reserved - ON *	Factory use only.	Factory use only.
5	Reserved - OFF *	Factory use only.	Factory use only.
6	Reserved - ON *	Factory use only.	Factory use only.
7	Maintenance	Places the server in maintenance mode status for testing.	Default. Server is not in maintenance mode.
8	Diskette Boot Override	Enables system booting from the diskette drive regardless of the System Configuration settings.	Default. System booting from the diskette drive is controlled by the System Configuration settings.

* Must be set as shown for the server to operate correctly.

CAUTION: Setting the processor switchbanks incorrectly can result in permanent damage to the processor and/or data loss.

CAUTION: Processors on the same processor board MUST be installed in matched frequency. All processors installed in a Compaq ProLiant 850R Server must be 200 MHz.

Battery Jumper

The system board allows you to add an external battery if the embedded battery fails. A jumper on header E2 on the system board allows you to choose the internal battery or an external battery. Placing the jumper on pins 6-7 selects the internal battery. Placing the jumper on pins 5-6 selects the external battery.

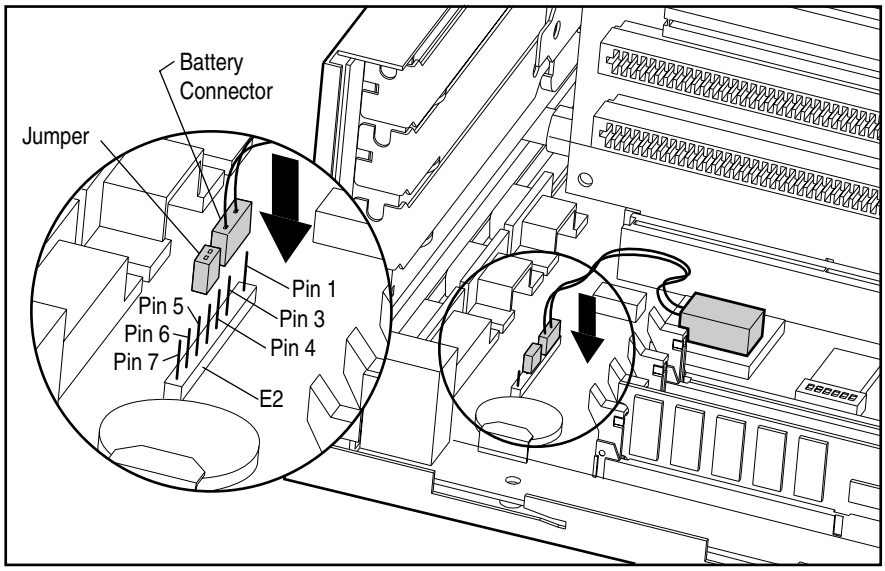

Figure 4-2. System Board Battery Jumper

Feature Board Battery

You can add an external battery to the feature board if the embedded battery fails. A jumper on header E1 on the feature board selects between the internal battery and an external battery. Placing the jumper on pins 1-2 selects the internal battery. Placing the jumper on pins 2-3 selects the external battery.

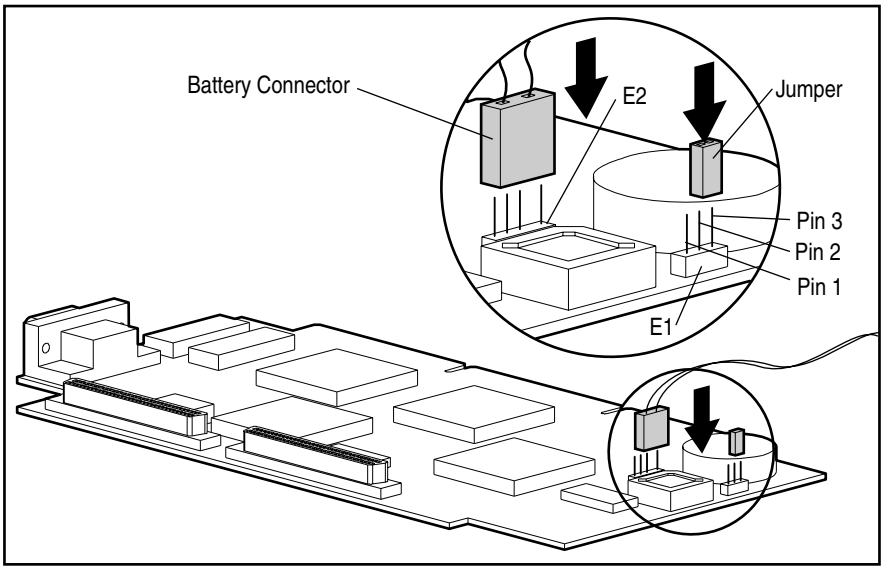

Figure 4-3. Feature Board Battery Jumper

SCSI Devices

No two SCSI devices connected to the same SCSI controller have the same SCSI ID. If another SCSI device is connected to the same controller, check its SCSI ID in the Compaq System Configuration Utility before beginning installation procedures for an additional drive (see Chapter 3). The SCSI ID is set by jumpers ID 2, ID 1, and ID 0 located on each SCSI device.

The following chart provides the SCSI ID jumper settings for Compaq SCSI hard drives.

Table 4-2
SCSI ID Settings

SCSI ID	Bit 2	Bit 1	Bit 0
6	ON	ON	OFF
5	ON	OFF	ON
4	ON	OFF	OFF
3	OFF	ON	ON
2	OFF	ON	OFF
1	OFF	OFF	ON
0	OFF	OFF	OFF

Chapter 5
Physical and Operating Specifications

This section provides operating and performance specifications for Compaq ProLiant 850R Servers and optional hardware.

- System Unit
- Power Supply
- Memory
- Diskette Drive
- IDE CD-ROM Drives
- Controllers
- Hard Drives
- Network Controller
- Network Cables

System Unit

Table 5-1
Compaq ProLiant 850R Servers
System Unit Specifications

	U.S	International
Dimensions		
Height	5.1 in	12.85 cm
Depth	15.8 in	40.13 cm
Width	17.7 in	45.00 cm
Weight		
Fully Configured	30.0 lb	13.64 kg
Input Requirements		
Rated Input Voltage	100 to 120 VAC	220 to 240 VAC
Rated Input Voltage	50 - 60 Hz	
Rated Input Current	5.0 A	3.0 A
Power Supply Output Power		
Rated Stead-State Power	200 W	
Maximum Peak Power	200 W	
BTUs	1010 Btu/h	1010 Btu/h
Temperature Range		
Operating Range	50° to 95°F	10° to 35°C
Non-operating Range	-4° to 122°F	-20° to 50°C
Relative Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Wet Bulb Temperature	101.7°F	38.7°C

Power Supply

Table 5-2
Power Supply Specifications

	U.S	International
Input Specifications		
Nominal Line Voltage	100 to 120 VAC	220 to 240 VAC
Range Input Line	90 to 132 VAC	180 to 264 VAC
Frequency Range	47 to 63 Hz	47 to 63 Hz
Power Factor	0.6	0.6
Input Power	300 W	300 W
Input Current Requirement		
Maximum steady state	<5.5 A rms	<3 A rms
Inrush Current		
Cold start	<80 A	<80 A
Hot start	<80 A	<80 A
Holdup Time	20 ms from zero crossing at 120 VAC	20 ms from zero crossing at 240 VAC
General Specifications		
Full Output Rating	To 40°C and 5,000 ft	
	To 32°C and 10,000 ft (derate linearly)	
Minimum Load	3.0 A on +12 V output 0.0 A on +3.5 V output 0.0 A on +12 V output 0.0 A on -12 V output 0.0 A on -5 V output	
Ambient Temperature Range		
Operating	50° to 122°F	10° to 40°C
Storage	-40° to 149°F	-40° to 65°C
Dielectric Voltage Withstand		
Input to Output	3000 VAC/min	
Input to Ground	1500 VAC/min	
Safety Standard	UL 1950; CSA 22.2 #950 or CSA 22.2 #234; TUV/VDE EN 60 950 (VDE0805/11.91); EMKO-TSE 207/94	
EMI	3 dB below CISPR Publication 22 Class B; 6 dB below BMPT - AmtsblVfg 243/1991 limits; 6 dB below CFR 47, Part 15 Class B limits.	
Input Transient Protection	Complies with conditions as defined in the following specifications: IEC801-4 or IEC801-5.	

Memory

Table 5-3
Dual Inline Memory Module Specifications

Size	16, 32, 64, 128 MB
Speed	60 ns
Width	72 bits
Upgrade Requirement	Any combination of DIMMs with minimum of 32 MB total memory required

NOTE: Use only 16-, 32-, 64-, or 128-MB, EDO, unbuffered, 72-bit wide, 4-K refreshed, 3.3-volt, ECC DIMMs. DIMMs must be 60-ns or faster. Use Compaq DIMMs only.

1.44-MB Internal Diskette Drive

Table 5-4
1.44-MB Internal Diskette Drive Specifications

Size	3 1/2 in
LED Indicators (front panel)	Green
Read/Write Capacity per Diskette (high/low density)	1.44 MB/720 KB
Drive Supported	One
Drive Height	One-third
Drive Rotation	300 rpm
Transfer Rate bits/sec (high/low)	500 K/250 K
Bytes/Sector	512
Sectors/Track (high/low)	18/9
Tracks/Side (high/low)	80/80
Access Times	
Track-to-Track (high/low)	3 ms/6 ms
Average (high/low)	169 ms/94 ms
Settling Time	15 ms
Latency Average	100 ms
Cylinders (high/low)	80/80
Read/Write Heads	Two

Low-Profile IDE CD-ROM Drive (Proliant 850R 6/200H only)

Table 5-5
Low-Profile IDE CD-ROM Drive Specifications

Applicable Disk	CD-ROM (Mode 1 and 2); CD-XA (Mode 2, Form 1 and 2); CD-1 (Mode 2, Form 1 and 2); CD-1 Ready; CD-Bridge; PhotoCD (Single and Multi Session); CD-WO (Fixed packets only)	
Capacity	550 MB (Mode 1, 12 cm); 640 MB (Mode 2, 12 cm); 180 MB (8 cm)	
Block Size	2638, 2352 bytes (Mode 0); 2352, 2340, 2336, 1024 bytes (Mode 1); 2352, 2340, 2336, 2048, 1024 bytes (Mode 2)	
Dimensions		
Height	0.5 in	12.7 mm
Depth	5.12 in	130 mm
Width	5.16 in	131 mm
Weight	< 12.35 oz	< 350 g
Data Transfer Rate		
Sustained	1200 KB/s	
Burst	8.3 MB/s	
Access Times (typical)		
Full Stroke	< 600 ms	
Random, 8X speed	< 275 ms	
Disk		
Diameter	4.7 in, 3.15 in	12 cm, 8 cm
Rotational speed	1840 to 4240 rpm	
Center Hole (diameter)	.6 in	15 mm
Thickness	.05 in	1.2 mm
Track pitch	1.6 µm	
Interface	IDE	
Cache/Buffer	256 KB	
Audio Output Level, Line Out	0.7 VRMS at 47 kΩ	
Cache buffer	256 KB	
Startup Time	<10 seconds	
Stop Time	<5 seconds	
Laser Parameters		
Type	Semiconductor Laser GaAlAs	
Wave Length	780 nm +/- 35 nm	
Divergence Angle	53.5 degrees +/- 1.5 degrees	
Output Power	0.13 mW	
Operating Conditions		
Temperature	41° to 113°F	5° to 45°C
Humidity	10% - 80%	

8X IDE CD-ROM Drive (Proliant 850R 6/200N only)

Table 5-6
8X IDE CD-ROM Drive Specifications

Applicable Disk	CD-ROM (Mode 1 and 2); CD-DA, CD-XA (Mode 2, Form 1 and 2);Photo CD (single and multi session); Mixed Mode (audio and data combined)	
Capacity	550 MB (Mode 1, 12 cm); 640 MB (Mode 2, 12 cm); 180 MB (8 cm)	
Block Size	2048, 1024 b (Mode 1); 2340, 2336, 1024 b (Mode 2); 2352 b (CD-DA)	
Dimensions		
Height	1.69 in	4.29 cm
Depth	8.19 in	20.8 cm
Width	5.75 in	14.6 cm
Weight	2.09 lb	.95 kg
Data Transfer Rate		
Sustained / Burst	1200 KB/s / 4 MB/s	
Access Times (typical)		
Full Stroke	350 ms	
Random	150 ms	
Disk		
Diameter	4.7 in, 3.15 in	12 cm, 8 cm
Rotational speed	1840 to 4240 rpm	
Center Hole (diameter)	.6 in	15 mm
Thickness	.05 in	1.2 mm
Track pitch	1.6 µm	
Interface	IDE	
Cache/Buffer	128 KB (minimum)	
Audio Output Level		
Line Out	0.7 VRMS at 47 kΩ	
Headphone	0.6 VRMS at 32 Ω (at maximum volume)	
Cache buffer	128 KB	
Startup Time	<7 seconds	
Stop Time	<4 seconds	
Laser Parameters		
Type	Semiconductor GaAlA	
Wave Length	780 nm +/- 35 nm	
Divergence Angle	53.5 degrees +/- 0.5 degrees	
Output Power	Less than 0.2 mW/10,869 Wm^{-2} sr^{-1}	
Polarization	Circular 0.25	
Numerical Aperture	0.45 in +/- 0.04 in	
Operating Conditions		
Temperature	41° to 113°F	5° to 45°C
Humidity	10% - 80%	

Video Controller

Table 5-7
Video Controller Specifications

Controller Chip	Cirrus Logic CL-GD54M30
Video DRAM	1 MB Video DRAM
Data Transfer Method	32-bit PCI
Supported Resolutions:	Supported Color Depths:
640 x 480	16.7M, 64K, 256, 16
800 x 600	64K , 256, 16
1024 x 768	256, 16
Connector	VGA

Integrated Wide-Ultra SCSI-3 Controller

Table 5-8
Integrated Wide-Ultra SCSI-3 Controller Specifications

Drives Supported	Up to 4 internal or 7 external
Data Transfer Method	32-bit PCI bus master
Host Bus Transfer Rate	132 MB/s
SCSI Transfer Rate	40 MB/s
External SCSI Connector	68-pin Fast-Wide SCSI-2
Internal SCSI Connector	68-pin Wide-Ultra SCSI

SMART-2DH Array Controller

Table 5-9
SMART-2DH Array Contoller Specifications

Protocol	Wide-Ultra SCSI-3
SCSI Electrical Interface	Single-ended
Drives supported	Up to 14
Data Transfer Method	32-bit PCI bus master
Maximum Transfer Rate on PCI Bus (peak)	132 MB/s
Simultaneous Drive Transfer Channels	Two
SCSI Bus Termination	Required
Total Transfer Rate	80 MB/s (40-MB/s per channel)
Software Upgradable Firmware	Yes

Continued

SMART-2DH Array Controller Specifications *Continued*

Cache (Read Only)	16-MB ECC-protected cache, removable with battery backup
Logical Drives Supported	32
Reliability Features	
Distributed Data Guarding (RAID 5)	Yes
Drive Mirroring (RAID 4)	Yes
Drive Striping (RAID 0)	Yes
Controller Duplexing	Operator-system dependent
Automatic Data Recovery	Yes

SMART-2SL Array Controller

Table 5-10
SMART-2SL Array Contoller Specifications

Protocol	Wide-Ultra SCSI-3
SCSI Electrical Interface	Single-ended
Drives supported	Up to 7 Wide-Ultra SCSI-3, or Fast-Wide or Fast-SCSI-2 hard drives
Data Transfer Method	32-bit PCI bus master
Maximum Transfer Rate on PCI Bus (peak)	132 MB/s
Simultaneous Drive Transfer Channels	One
Total Transfer Rate	40 MB/s
Software Upgradable Firmware	Yes
Cache (Read Only)	6-MB ECC-protected Read Cache
Logical Drives Supported	32
Reliability Features	
Distributed Data Guarding (RAID 5)	Yes
Drive Mirroring (RAID 4)	Yes
Drive Striping (RAID 0)	Yes
Controller Duplexing	Operator-system dependent
Automatic Data Recovery	Yes

SMART-2/P Controller

Table 5-11
SMART-2/P Controller Specifications

Dimensions		
Height	3.9 in	9.9 cm
Length	13.75 in	34.9 cm
Thickness (including Array Accelerator)	0.60 in	1.5 cm
Total Weight (including Array Accelerator)	N/A	N/A
Temperature Range		
Operating	50° to 95°F	10° to 35°C
Shipping	-22° to 140°F	-30° to 60°C
Relative Humidity (non-condensing)		
Operating	20% to 80%	20% to 80%
Non-operating	5% to 90%	5% to 90%
Power Required		
+5 V	2.6 A	
+12 V	20 mA	
-12 V	20 mA	
Heat Dissipated (maximum)	13.5 W	
SCSI Channels	2	
Drives Supported (maximum, internal and external)	14	
Data Transfer Method	32-bit bus master	
SCSI Bus Transfer Rate (maximum)	40 MB/s (10 MHz)	
PCI Bus Transfer Rate (maximum)	132 MB/s	
SCSI Bus Termination	Required	
SCSI Port Connectors (internal and external)	68-pin Fast-Wide SCSI-2	

2.1-Gigabyte Fast-Wide SCSI-2 Drive (ProLiant 850R 6/200N only)

Table 5-12
2.1-Gigabyte Fast-Wide SCSI-2 Drive Specifications

Capacity	2104.3 MB
Block Size	512 bytes
Interface	Single-Ended Fast-Wide SCSI-2
Synchronous Transfer Rate	Up to 20 MB/s
Buffer Size	256 KB
RPM	7200 RPM
Average Access	9.0 ms

4.3-Gigabyte Fast-Wide SCSI-2 Drive (ProLiant 850R 6/200N only)

Table 5-13
4.3-Gigabyte Fast-Wide SCSI-2 Drives Specifications

Capacity	4293.6 MB
Block Size	512 bytes
Interface	Single-Ended Fast-Wide SCSI-2
Synchronous Transfer Rate	Up to 20 MB/s
Buffer Size	512 KB
RPM	7200 rpm
Average Access	9.0 ms

2.1-Gigabyte Wide-Ultra SCSI Drive

Table 5-14
2.1-Gigabyte Wide-Ultra SCSI Drives Specifications

Capacity	2097.4 MB
Height	Third, 1 in
Size	3.5 in
Interface	Wide-Ultra SCSI
Transfer Rate	40 MB/s
Sector Interleave	1:1
Seek Times (typical, including settling)	
Single Track	1.9 ms
Average	9.5 ms
Full Stroke	18.5 ms
Rotational Speed	7200 RPM

4.3-Gigabyte Wide-Ultra SCSI Drive

Table 5-15
4.3-Gigabyte Wide-Ultra SCSI Drives Specifications

Capacity	4293.6 MB
Height	Third, 1 in
Size	3.5 in
Interface	Wide-Ultra SCSI
Transfer Rate	40 MB/s
Sector Interleave	1:1
Seek Times (typical, including settling)	
Single Track	1.0 ms
Average	7.9 ms
Full Stroke	19.0 ms
Rotational Speed	7200 RPM

9.1-Gigabyte Wide-Ultra SCSI Drive (ProLiant 850R 6/200N only)

Table 5-16
9.1-Gigabyte Wide-Ultra SCSI Drives Specifications

Capacity	9100.0 MB
Height	Half
Size	3.5-inch
Interface	Wide-Ultra SCSI
Transfer Rate	40 MB/s
Sector Interleave	1:1
Seek Times (typical, including settling)	
Single Track	1.0 ms
Average	7.9 ms
Full Stroke	19.0 ms
Rotational Speed	7200 RPM

Integrated 10/100 TX UTP Controller

Table 5-17
Integrated 10/100 TX UTP Controller

Network Interface	10base-T/10Base-2/100base-TX
Compatibility	IEEE 802.3/802.3u compliant
Data Transfer Method	32-bit bus-master PCI
Network Transfer Rate:	
10Base-T (Half-Duplex), 10Base-2	10 Mb/sec
10Base-T (Full-Duplex)	20 Mb/sec
100Base-TX (Half-Duplex)	100 Mb/sec
100Base-TX (Full-Duplex)	200 Mb/sec
Cable Support:	
10Base-T	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 100 meters (328 feet)
100Base-TX	Category 5 UTP (2 pair); up to 100 meters (328 feet)
OS Driver Support	Novell NetWare DOS ODI and Requestor for OS/2, 3.x and 4.x Server; NDIS 2.0 DOS and OS/2: Microsoft LAN Manager, Windows for Workgroups; IBM LAN Server NDIS 3.0: Microsoft Windows NT, Windows 95, Windows for Workgroups; SCO UNIX

Ethernet Cable (10/100BASE-T)

Table 5-18
Ethernet Cable Specifications Twisted Pair (10/100BASE-T)

Connector type	RJ-45, 8-pin
Cable type	Unshielded twisted pair (UTP) 22-26AWG, 100 Ω @ 1 MHz
Cable Support:	
10Base-T	Categories 3, 4, or 5 UTP (2 or 4 pair); up to 100 meters (328 feet)
100Base-TX	Category 5 UTP (2 pair); up to 100 meters (328 feet)
Distance	Up to 100 meters from node to concentrator

10Base-2 Thin Ethernet Cable (Coax)

Table 5-19
10Base-2 Thin Ethernet Cable (Coax)

Connector type	BNC
Cable type	RG 58, 50 Ohm
Distance	Up to 200 meters

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