



ProLiant 6000 Servers

Maintenance and Service Guide

First Edition (May 1997)
Document Part Number 296066-001
Spares Part Number 186881-001
Compaq Computer Corporation

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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 6000 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 6000 Servers without notice. This document contains the following chapters:

- **Chapter 1 - Illustrated Parts Catalog**
Contains Compaq ProLiant 6000 exploded views and spares parts list.
- **Chapter 2 - Removal and Replacement Procedures**
Contains steps for removing and replacing Compaq ProLiant 6000 spare parts.
- **Chapter 3 - Diagnostic Tools**
Describes software and firmware diagnostic tools available for all Compaq server products.
- **Chapter 4 - Switches and Jumpers**
Provides switch and jumper information for the Compaq ProLiant 6000 Servers.
- **Chapter 5 - Physical and Operating Specifications**
Provides the physical and operating specifications for the Compaq ProLiant 6000 Servers.

Symbols

The following text and symbols mark special information 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.


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viii About This Guide


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>)
- Other information sources

Electronic Services

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

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x About This Guide

- Internet: Questions can be submitted to Compaq Technical Support staff using the electronic mail address: support@compaq.com. Compaq files can be accessed using the address: [FTP.COMPAQ.COM](ftp://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>.

- 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”.
- 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
 - *Compaq Service Quick Reference Guide*
 - Service Training Guides
 - Compaq Service Advisories and Bulletins
 - Compaq QuickFind
 - Compaq Insight Manager
-

System Components Exploded View

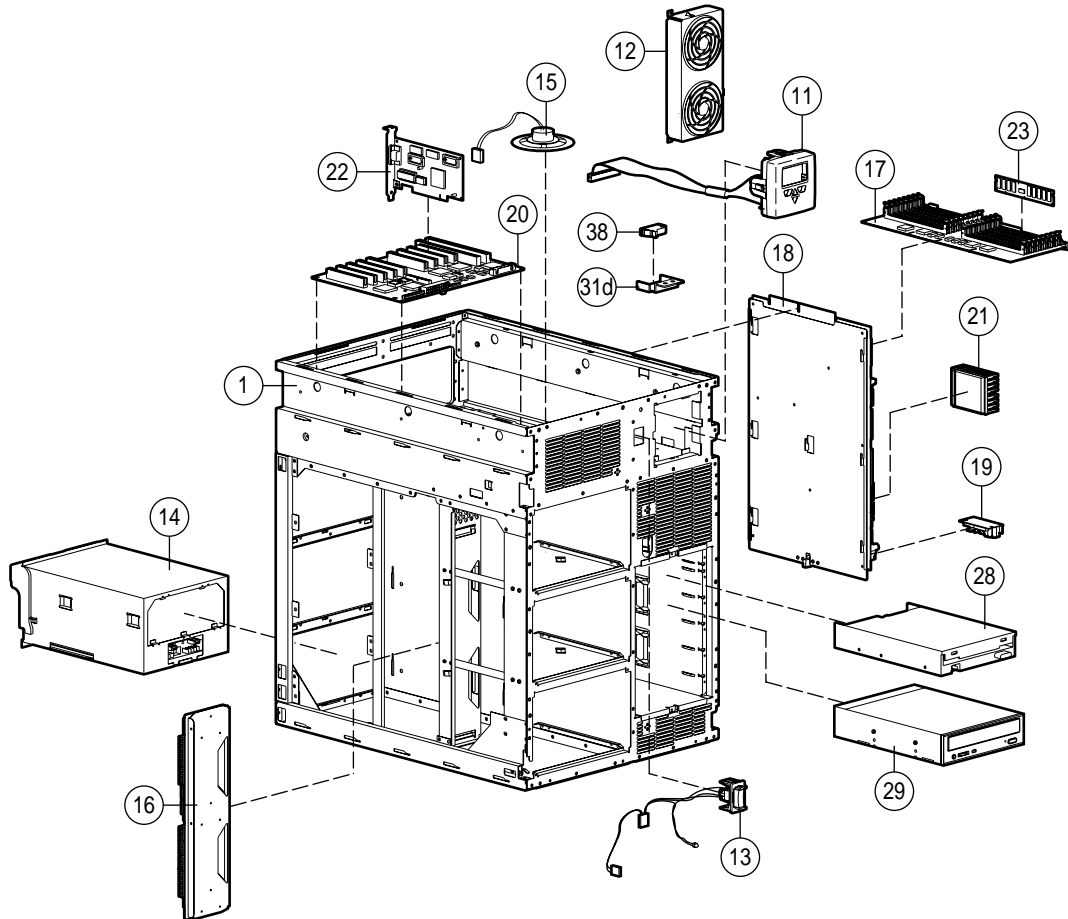


Figure 1-2. Exploded View of the Compaq ProLiant 6000 Server System Components

Spares Parts List

Table 1-1 Spares Parts List - Compaq ProLiant 6000 Servers		
Ref	Description	Spares Part #
CHASSIS		
1	Chassis	289741-001
2	Top Cover	186893-001
3	Casters	296227-001
4	Side Access Panels	186892-001
5	Right Front Bezel	186891-001
6	Left Front Bezel	186890-001
7	Power Supply Lock Bar	296201-001
8	Vent Hood	289744-001
9	PCI/EISA Expansion Board Guide	296204-001
ASSEMBLIES		
10	Drive Cage with Backplane	186894-001
11	Integrated Management Display Panel with Cable	271930-001
12	Twin Fans with Bracket	289743-001
13	On/Standby Switch with Cable	186885-001
SYSTEM COMPONENTS		
14	Power Supply	169286-001
15	Speaker with Clip and Insulator	186887-001
BOARDS		
16	Power Backplane Board	289742-001
17	Memory Expansion Board with Stiffener	289745-001
18	686 Processor Board with Lever	186889-001
19	Processor Power Module	296203-001
20	PCI/EISA Expansion Board	296280-001
21	686/200 Processor, 512KB	289749-001
22	PCI Board 10/100 NIC	169849-001
MEMORY		
23	Memory Module, 16 MB, 60ns, EDO	289746-001
24	Memory Module, 32 MB, 60ns, EDO	281857-001 *
25	Memory Module, 64 MB, 60ns, EDO	281858-001 *
26	Memory Module, 128 MB, 60ns, EDO	281859-001 *
27	Memory Module, 256 MB, 60ns, EDO	281860-001 *

Continued

1-4 Illustrated Parts Catalog

Spares Parts List - Compaq ProLiant 6000 Servers *Continued*

Item	Description	Spares Part #
MASS STORAGE		
28	1.44-MB Diskette Drive	296224-001
29	8X CD-ROM Drive	295934-001
MISCELLANEOUS		
30	Processor Board Locking Lever	296899-001 *
31	Miscellaneous Hardware Kit a) Drive Blank Panel b) Power Supply Blank Panel * c) Removable Media Interlock Bar d) Interlock Switch Bracket	186879-001
32	Miscellaneous Plastics Kit a) Door Snap Receptacle * b) Slide Fillers c) Drive Cage Bezel * d) Option Board Keeper * e) Option Board Retainer * f) Push-Pull Fastener * g) Safety Switch Cover * h) Ribbon Cable Clip	186886-001
33	Miscellaneous Power Cable Kit	186883-001 *
34	Miscellaneous Signal Cable Kit	186884-001 *
35	SCSI Adapter (50/68)	189638-001 *
36	Country Kit	296226-001 *
37	Rackmount Kit	296377-001 *
38	Interlock Switch	297000-001 *
39	Safety Interlock Override Key	296199-001 *
40	4.5V Battery Replacement	296202-001 *
41	Maintenance and Service Guide	186881-001 *
42	Illustrated Parts Map	186882-001 *
KEYBOARDS		
43	Keyboard, US English	160648-101 *
44	Keyboard, U.K. English	160648-103 *
45	Keyboard, German	160648-104 *
46	Keyboard, French	160648-105 *
47	Keyboard, Italian	160648-106 *
48	Keyboard, Spanish	160648-107 *
49	Keyboard, Danish	160648-108 *
50	Keyboard, Norwegian	160648-109 *
51	Keyboard, Swedish/Finnish	160648-110 *
52	Keyboard, Swiss	160648-111 *

Continued

Spares Parts List - Compaq ProLiant 6000 Servers *Continued*

Item	Description	Spares Part #
53	Keyboard, French Canadian	160648-112 *
54	Keyboard, Portuguese	160648-113 *
55	Keyboard, Turkish	160648-114 *
56	Keyboard, Greek	160648-115 *
57	Keyboard, Latin American	160648-116 *
58	Keyboard, Arabic	160648-117 *
59	Keyboard, Belgian	160648-118 *
60	Keyboard, BHCSY	160648-120 *
61	Keyboard, Hungary	160648-121 *
62	Keyboard, Polish	160648-122 *
63	Keyboard, Slovakia	160648-123 *
64	Keyboard, Russia	160648-124 *
65	Keyboard, Czech	160648-129 *
OPTIONS		
66	9-GB Wide-Ultra Hard Drive with tray	199888-001 *
67	4-GB Wide-Ultra Hard Drive with tray, 1-inch	242622-001 *
68	2-GB Wide-Ultra Hard Drive with tray, 1-inch	242603-001 *
69	48W, 12V Processor Power Module, redundant	296851-001 *
70	Fan Assembly, redundant	296898-001 *
* Not Shown		

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 automatically 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.

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3-2 Diagnostic Tools

- 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 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.

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3-4 Diagnostic Tools

104-ASR-2 Timer Failure	None	System board failure.	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.

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3-6 Diagnostic Tools

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.

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3-8 Diagnostic Tools

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.

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3-10 Diagnostic Tools

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.	<ol style="list-style-type: none"> 1. For Intergrated SCSI Controllers, ensure that the internal connector has SCSI termination attached. 2. For option card SCSI controllers, ensure that only one of the two internal connectors has termination attached.

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3-12 Diagnostic Tools

1703-SCSI cable error detected. Internal SCSI cable not attached to system board connector. System halted.	None	Incorrect cabling.	Ensure 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.

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3-14 Diagnostic Tools

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 for Automatic Data Recovery to complete, 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.

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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.

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3-18 Diagnostic Tools

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 <i>X</i> 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 <i>X</i> . 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 <i>X</i> 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 <i>X</i>	None	Hard drive <i>X</i> failed or cable is loose or defective. Following a system restart, this message reminds you that drive <i>X</i> is defective and fault tolerance is being used.	1. Replace drive <i>X</i> as soon as possible. 2. Check loose cables. 3. Replace defective cables.

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3-20 Diagnostic Tools

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. *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, but not because 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.	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.

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.	<ol style="list-style-type: none">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.
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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.

<p>1794-Drive Array - Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be re-enabled when battery reaches full charge.</p>	<p>None</p>	<p>This is a warning that the battery charge is below 75%. Posted writes are disabled.</p>	<p>Replace the Array Accelerator board if batteries do not recharge within 36 power-on hours.</p>
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3-24 Diagnostic Tools

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.	<ol style="list-style-type: none"> 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. Ensure 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.
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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.

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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.
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Primary Processor Test Error Codes

The 100 series of Diagnostic error codes identify 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	DMA page registers test failed	For error codes 103-xx through 106-xx, replace the processor board and retest.
104-xx	Interrupt controller master test failed	
105-xx	Port 61 error	
106-xx	Keyboard controller self-test failed	
107-xx	CMOS RAM test failed	The following steps apply to error codes 107-xx through 109-xx.
108-xx	CMOS interrupt test failed	
109-xx	CMOS clock load data test failed	
		<ol style="list-style-type: none"> 1. Replace the battery/clock module and retest. 2. Replace the system board and retest.
110-xx	Programmable timer load data test failed	For error codes 110-xx through 113-xx, replace the system board and retest.
111-xx	Refresh detect test failed	
112-xx	Speed test slow mode out of range	
113-xx	Protected mode test failed	
114-xx	Speaker test failed	<ol style="list-style-type: none"> 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	Multiprocessor Dispatch test failed	<ol style="list-style-type: none"> 1. Check the system configuration and retest. 2. Replace the processor board and retest. 3. Replace the system board and retest.
123-xx	Interprocessor Communication test failed	

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199-xx	Installed devices test failed	<ol style="list-style-type: none">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.
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Memory Test Error Codes

The 200 series of Diagnostic error codes identify 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	Memory machine ID test 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.
202-xx	Memory system ROM checksum failed	
203-xx	Memory write/read 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.
204-xx	Memory address test failed	
205-xx	Walking I/O test failed	
206-xx	Increment pattern test failed	
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 identify 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:
302-xx	Keyboard long test failed	1. Check the keyboard connection. If disconnected, turn off the computer and connect the keyboard and retest.
303-xx	Keyboard LED test, 8042 self-test failed	2. Replace the keyboard and retest.
304-xx	Keyboard typematic test failed	3. Replace the system board and retest.

Parallel Printer Test Error Codes

The 400 series of Diagnostic error codes identify 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:
402-xx	Printer data register failed	1. Connect the printer and retest.
403-xx	Printer pattern test failed	2. Check the power to the printer and retest.
498-xx	Printer failed or not connected	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.

Video Display Unit Test Error Codes

The 500 series of Diagnostic error codes identify 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 identify 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 identify 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
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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 identify 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: <ol style="list-style-type: none">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 identify 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: <ol style="list-style-type: none">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 identify 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
1701-xx	Fixed disk format test failed	
1702-xx	Fixed disk read test failed	1700-xx through 1799-xx: 1. Run the System Configuration Utility and
1703-xx	Fixed disk write/read/compare test failed	
1704-xx	failed	verify the drive type.
1705-xx	Fixed disk random seek test failed	2. Replace the fixed disk drive signal and power cables and retest.
1708-xx	Fixed disk controller test failed	
1709-xx	Fixed disk format bad track test failed	3. Replace the fixed disk drive controller and retest.
1710-xx	Fixed disk reset controller test failed	
1715-xx	Fixed disk park head test failed	4. Replace the fixed disk drive and retest.
1716-xx	Fixed disk head select test failed	
1717-xx	Fixed disk conditional format test failed	5. Replace the system board and retest.
1719-xx	Fixed disk ECC* test failed	
1736-xx	Fixed disk drive power mode test failed	
1799-xx	Drive Monitoring failed	
	Invalid fixed disk drive type failed	

* Error Checking and Correcting

Tape Drive Test Error Codes

The 1900 series of Diagnostic error codes identify 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 identify 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 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	

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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	
2418-xx	response	
2419-xx	ECG/VGC memory test failed	
2420-xx	ECG/VGC ROM checksum test failed	
2421-xx	ECG/VGC attribute test failed	
2422-xx	ECG/VGC 640 x 200 graphics mode test	
2423-xx	failed	
2424-xx	ECG/VGC 640 x 350 16-color set test	
2425-xx	failed	
2431-xx	ECG/VGC 640 x 350 64-color test failed	
2432-xx	ECG/VGC monochrome text mode test	
2448-xx	failed	
2451-xx	ECG/VGC monochrome graphics mode	
2456-xx	test failed 640 x 480 graphics test failure 320 x 200 graphics (256-color mode) test failure Advanced VGA Controller test failed 132-column Advanced VGA test failed 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 identify 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	<p>The following steps apply to error codes 6000-xx through 6089-xx:</p> <ol style="list-style-type: none"> 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	failed	
6506-xx	SCSI Disk Read Test Failed	
6509-xx	SCSI Disk SA/Media test failed	
6523-xx	SCSI Disk Erase tape test failed	
6528-xx	SCSI Disk Random Read test failed Media load/unload test failed	

SCSI/IDE CD-ROM Drive Test Error Codes

The 6600 series of Diagnostic error codes identify 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
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6600-xx	CD-ROM ID failed	The following steps apply to error codes 6600-xx through 6605-xx: <ol style="list-style-type: none">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 identify 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: <ol style="list-style-type: none">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 identify 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	

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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 identify 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: <ol style="list-style-type: none"> 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 that contain 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	Array accelerator board has been temporarily disabled.	Check the Disable Code field.

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disabled		
Accelerator status:	A status returned from the array	Obtain the latest version of
Unrecognized	accelerator board that DAAD	DAAD.
status	does not recognize.	

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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	Run the latest version of System Configuration Utility to configure the controller and nonvolatile RAM.

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this.

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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.

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Controller reported POST error. Error Code: x	The controller returned an error from its internal Power-On Self Tests.	Replace the controller.
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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.

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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.
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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.

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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	Check the fans and the operating environment.

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	operating levels and it has shut down to avoid damage.	
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.

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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 mismatch	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

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		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.

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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 is 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	This is a list of the individual	The drive may need to be

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for drive (bay) X	thresholds that have been violated for this drive.	replaced. Run the Compaq Diagnostics Utility to determine if the drive has been initialized and the threshold violation warrants drive replacement.
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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

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- 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

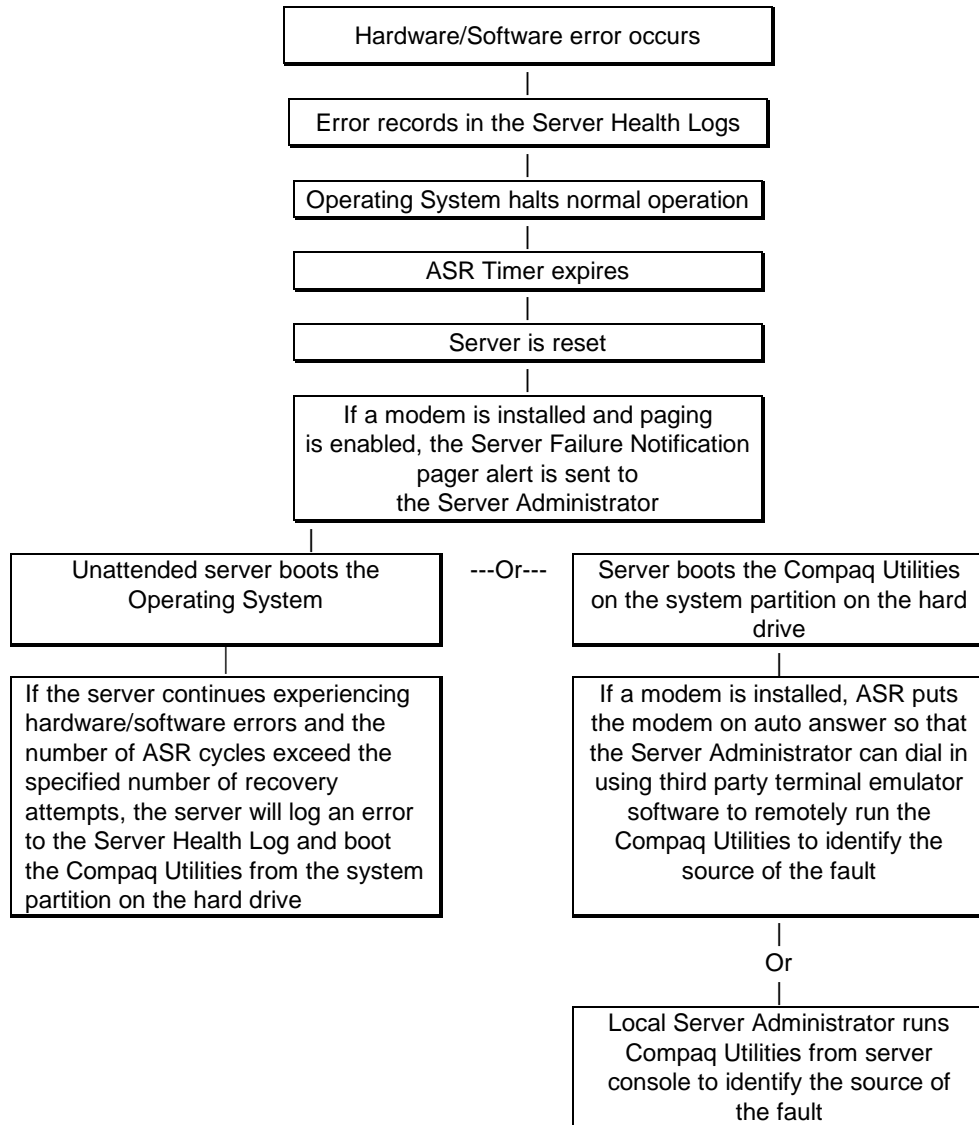
The Compaq Health Driver resets the ASR-2 timer according to the frequency you specified in the System Configuration Utility (for example, 10 minutes). If the ASR-2 timer counts down to zero before being reset, ASR-2 restarts the server into either Compaq Utilities or the operating system (as indicated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

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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 onsite, 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.

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Network	ETHERNE	Select the frame type for your network. Selections include
frame type	T_II	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.

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3-80 *Diagnostic Tools*

NMI- Automatic Server Recovery Timer Expiration	The operating system has received notice of an impending ASR-2 timer expiration.
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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.
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- 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.

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Chapter 4

Switch and Jumper Information

This chapter provides switch and jumper information for the Compaq ProLiant 6000 Servers.

Processor Board

The locations of switches SW1 - SW4, SW6, SW7, and SW9 are illustrated in the figure below.

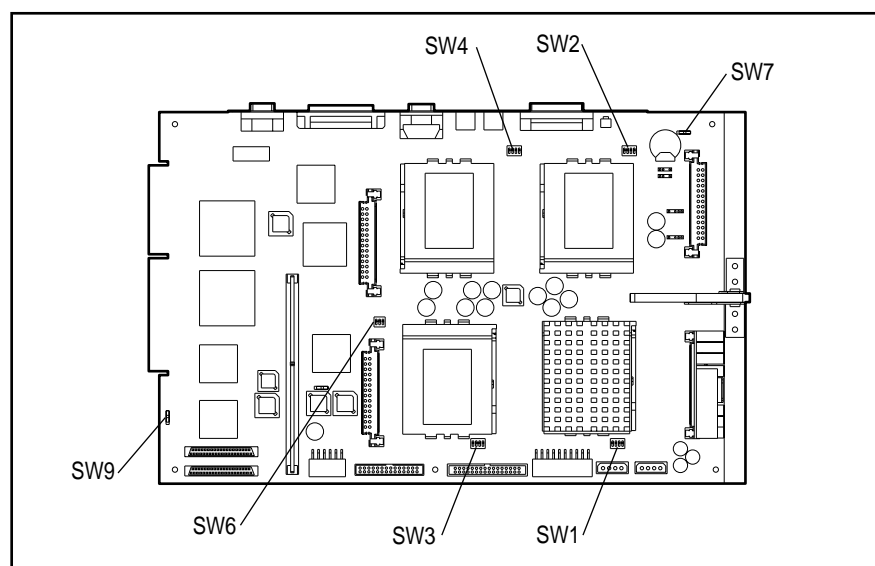


Figure 4-1. Location of Compaq ProLiant 6000 Processor Board Switches

4-2 Switch and Jumper Information

SW1 - SW 4: Bus/Core Frequency Ratio

Switches SW1 through SW4 on the processor board control the bus/core frequency ratio for the Compaq ProLiant 6000.

Table 4-1
SW1- SW4 - Bus/Core Frequency Ratio

Bus/Core Ratio		S1	S2	S3	S4
1/2	<i>Reserved</i>	ON	ON	ON	ON
2/5	<i>Reserved</i>	ON	ON	ON	OFF
1/3	<i>Default for 200 MHz models</i>	ON	ON	OFF	ON
2/7	<i>Reserved</i>	ON	ON	OFF	OFF
1/4	<i>Reserved</i>	ON	OFF	ON	ON
2/9	<i>Reserved</i>	ON	OFF	ON	OFF
1/5	<i>Reserved</i>	ON	OFF	OFF	ON
2/11	<i>Reserved</i>	ON	OFF	OFF	OFF
Reserved		OFF	X	X	X



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.

SW6: Bus Clock Frequency

Switchbank SW6 controls the bus clock frequency for the Compaq ProLiant 6000.

Table 4-2
SW6 - Bus Clock Frequency

Frequency	1	2	3
50 MHz	ON	ON	OFF
60 MHz	ON	OFF	ON
66.66 MHz <i>Default</i>	OFF	ON	ON

SW7: Internal/External Battery

SW7 controls the processor board battery setting. If you install a replacement battery, change the switch to the external battery setting.

SW9: System Fan Speed

SW9 controls the system fan speed. Low speed setting is the default. When set to low, the system fan is controlled by temperature sensors and software.

PCI/EISA Expansion Board

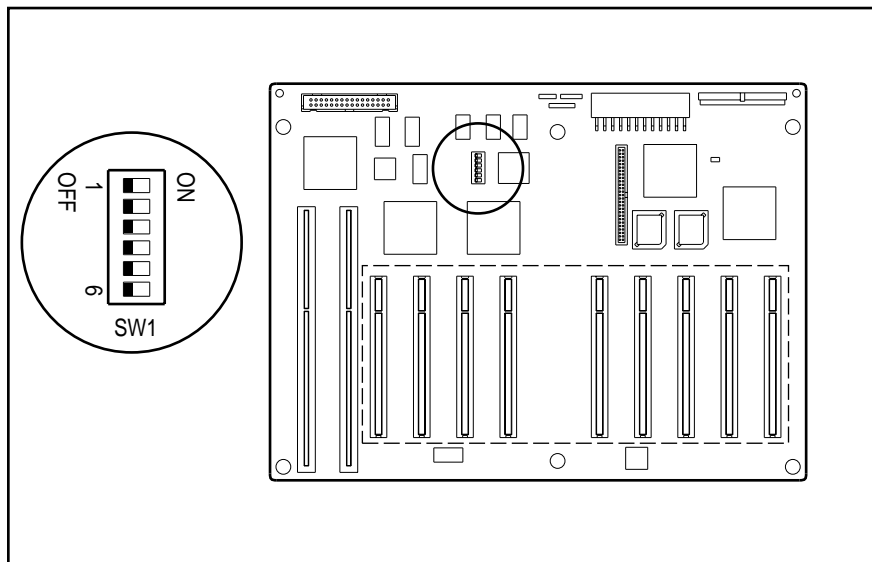


Figure 4-2. Location of PCI/EISA Expansion Board Switches

Switch SW1 is a six-position switchbank (S1-S6) that controls the security features and configuration of the computer.

Table 4-3
SW1 - System Maintenance Switch Settings

Switch	Function	ON	OFF
❶	Disable On-Board Video	On-board video is disabled.	<i>Default</i>
❷	Lock configuration information	You cannot change configuration information.	<i>Default</i>
❸	Tower-to-Rack Conversion	Converts the unit to a rack configuration.	<i>Default</i>
❹	Disable Diskette Boot	System booting from the diskette drive is disabled.	<i>Default</i>
❺	Disable Password	Clears passwords.	<i>Default</i>
❻	Clear NVRAM	Clears NVRAM.	<i>Default</i>

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4-4 *Switch and Jumper Information*

SCSI Devices

No two SCSI devices connected to the same SCSI controller can 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 the installation procedure for this additional drive. 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 4-4
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 6000 Family of Servers and optional hardware.

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

5-2 Physical and Operating Specifications

System Unit

**Table 5-1
System Unit Specifications**

Dimensions		
Height	24.25 in	61.6 cm
Depth	22.8 in	57.9 cm
Width	17.5 in	44.5 cm
Weight		
No drives, one power supply	98.2 lb	44.5 kg
Input Requirements (per power supply)	Low range	High range
Rated Input Voltage	100 to 120 V	200 to 240 V
Rated Input Frequency	50 - 60 Hz	50 to 60 Hz
Rated Input Current	8 A	6 A
Heat Dissipation *	2594BTU/h	3754 BTU/h
Power Supply Output Power (per power	Low range	High range
Rated Steady-State Power	500 W	750 W
Maximum Peak Power	549 W	780 W
Temperature Range		
Operating	50° to 95° F	10° to 35° C
Shipping	-22° to 122° F	-30° to 60° C
Relative Humidity (noncondensing)		
Operating	20% to 80%	20% to 80%
Nonoperating	5% to 90%	5% to 90%
Maximum Wet Bulb Temperature	101.7° F	38.7° C
* Heat dissipation based on single power supply configuration loaded to maximum output rated steady-state power.		

Power Supply

**Table 5-2
Power Supply Specifications**

Input Specifications		
Nominal Line Voltage	100 to 120 VAC	200 to 240 VAC
Range Input Line	90 to 132 VAC	180 to 270 VAC
Frequency Range	47 to 63 Hz	47 to 63 Hz
Power Factor	0.95	0.95
Input Power	760 W	1100 W
Input Current	8 A at 100 VAC	6 A at 200 VAC
Inrush Current	<150 A at 132 VAC (cold start)	<150 A at 132 VAC (cold start)
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	1.0 A on + 5V output; 1.0 A on +12V output 0.5 A on +3.3 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/minute	
Input to Ground	1500 VAC/minute	
Input Transient Susceptibility:		
Common and Differential Mode (superimposed on AC line) Differential Mode	2500V, 1 μ s, damped sinusoid 600V, 10 μ s pulse 20% step change in AC input voltage	

DIMM

Table 5-3
DIMM Specifications

Size	16, 32, 64, or 256 MB
Speed	60 ns or faster
Upgrade Requirement	Bank of 4 identical DIMMs installed or removed at a time

NOTE: Use only 16, 32, 64, or 256 MB; EDO- or FASTPAGE-buffered; gold-connector; 4 K or 8 K refreshed DIMMs.

1.44-MB Diskette Drive

Table 5-4
1.44 MB Diskette Drive Specifications

Size	3 1/2-inch
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 (rpm)	300
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)	169/94 ms
Settling Time	15 ms
Latency Average	100 ms
Cylinders (high/low)	80/80
Read/Write Heads	Two

IDE CD-ROM Drive

Table 5-5
8X CD-ROM Drive Specifications

Applicable Disk	CD-ROM (Mode 1 and 2) CD-DA, CD-XA; Photo CD (single and multi session) Mixed Mode (audio and data combined)	
Capacity	540 MB (Mode 1, 12 cm) 630 MB (Mode 2, 12 cm) 180 MB (8 cm)	
Block Size	2048 bytes (Mode 1) 2340, 2336, bytes (Mode 2) 2352 bytes (CD-DA) 2328 bytes (CD-XA)	
Dimensions		
Height	1.68 in	42.9 mm
Depth	5.85 in	150.1 mm
Width	8.11 in	208.0 mm
Weight	2.09 lb	.950 g
Data Transfer Rate		
Sustained	150 KB/s (sustained 1X), 1200 KB/sec (sustained 8X)	
Burst	4.0 MB/sec	
Access Times (typical)		
Full Stroke	350 ms	
Random	150 ms	
Diameter	4.7 in, 3.15 in	12 cm, 8 cm
Thickness	.05 in	1.2 mm
Track pitch	1.6 μ m	
Cache/Buffer	128 KB	
Startup Time	< 7 s	
Stop Time	< 4 s (single); <30 s (multi-session)	
Laser Parameters		
Type	Semiconductor Laser GaAlAs	
Wave Length	790 +/- 25 nm	
Divergence Angle	53.5° +/- 1.5°	
Output Power	0.14 mW	
Operating Conditions		
Temperature	41° to 113°F	5° to 45°C
Humidity	10% - 80%	5% to 90%

2.1-Gigabyte Wide-Ultra SCSI Drive

Table 5-6
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 5-7
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

Table 5-8
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

SMART-2/P Array Controller

Table 5-9
SMART-2/P Array 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		
+5V	2.6 amps	
+12V	20 ma	
-12V	20 ma	
Heat Dissipated (maximum)	13.5 watts	
SCSI Channels	2	

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5-8 *Physical and Operating Specifications*

Continued

SMART-2/P Array Controller Specifications *Continued*

Drives Supported (maximum, internal and external)	14
Data Transfer Method	32-Bit bus master
SCSI Bus Transfer Rate (maximum)	20 MB/sec (10 MHz)
PCI Bus Transfer Rate (maximum)	132 MB/sec
SCSI Bus Termination	Required
SCSI Port Connectors (internal and external)	68-pin Fast-Wide SCSI-2

SMART-2/E Controller

Table 5-10
SMART-2/E Controller Specifications

Dimensions		
Height	4.5 in	11.4 cm
Length	13.5 in	34.3 cm
Thickness (including Array Accelerator)	0.6 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		
+5V	3.0 a	
+12V	20 ma	
-12V	20 ma	
Heat Dissipated (maximum)	15.5 watts	
SCSI Channels	2	
Drives Supported (maximum, internal and external)	14	
Data Transfer Method	32-Bit Bus Master	
SCSI Bus Transfer Rate (maximum)	20 MB/sec (10 MHz)	
EISA Bus Transfer Rate (maximum)	33 MB/sec	
SCSI Bus Termination	Required	
SCSI Port Connectors (internal and external)	68-pin Fast-Wide SCSI-2	

Wide-Ultra SCSI Controller

Table 5-11
Wide-Ultra SCSI Controller Specifications

Drives Supported	Up to 7 total (internal)
Data Transfer Method	32-bit bus master
SCSI Channel Transfer Rate	40 MB/s
Maximum Transfer Rate on PCI Bus	132 MB/s
SCSI Termination	Active termination
External SCSI Connector	68-Pin wide SCSI Connector
Internal SCSI Connector	50-Pin Fast-SCSI-2 Connector 68-Pin wide SCSI Connector

32-Bit Fast-Wide SCSI-2/P Controller

Table 5-12
32-Bit Fast-Wide SCSI-2/P Controller Specifications

Drives Supported	Up to 7 total (internal or external)
Data Transfer Method	32-bit bus master
SCSI Channel Transfer Rate	20 MB/s
Maximum Transfer Rate on PCI Bus	132 MB/s
SCSI Termination	Active termination
External SCSI Connector	68-Pin wide SCSI Connector
Internal SCSI Connector	50-Pin Fast-SCSI-2 Connector 68-Pin wide SCSI Connector

32-Bit Fast-Wide SCSI-2/E Controller

Table 5-13
32-Bit Fast-Wide SCSI-2/E Controller Specifications

Dimensions		
Height	4.5 in	11.43 cm
Depth	0.375 in	0.95 cm
Width	10.5 in	26.67 cm
Total Weight	7.13 oz	205 g
Drives Supported	Up to 7 total (internal or external)	
Data Transfer Method	32-bit bus master	
SCSI Channel Transfer Rate	20 MB/s	
Maximum Transfer Rate on EISA Bus	33 MB/s	
SCSI Termination	Active termination	
External SCSI Connector	68-Pin wide SCSI Connector	
Internal SCSI Connector	50-Pin Fast-SCSI-2 Connector	
	68-Pin wide SCSI Connector	

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