

Notice

The information in this guide is subject to change without notice.

Compaq Computer Corporation shall not be liable for technical or editorial errors or omissions contained herein; nor for incidental or consequential damages resulting from the furnishing, performance, or use of this material.

This guide contains information protected by copyright. No part of this guide may be photocopied or reproduced in any form without prior written consent from Compaq Computer Corporation.

Copyright 1992 Compaq Computer Corporation.
All rights reserved. Printed in the U.S.A.

COMPAQ, SYSTEMPRO, FASTART
Registered U.S. Patent and Trademark Office.

ProSignia and QVision are trademarks of Compaq Computer Corporation.

The software described in this guide is furnished under a license agreement or nondisclosure agreement. The software may be used or copied only in accordance with the terms of the agreement.

Product names mentioned herein may be trademarks and/or registered trademarks of their respective companies.

MAINTENANCE AND SERVICE GUIDE
COMPAQ ProSignia Family of PC Servers
First Edition (September 1992)
Text Number 144257-001

Preface

This MAINTENANCE AND SERVICE GUIDE is a troubleshooting guide that can be used for reference when servicing COMPAQ ProSignia Family of Personal Computer Servers.

Compaq Computer Corporation reserves the right to make changes to the COMPAQ ProSignia PC Servers without notice.

Symbols

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

[illegible]

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

[illegible]

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

[illegible]

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

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

Technician Notes

[illegible]

Only authorized technicians trained by Compaq should attempt to repair this equipment. All troubleshooting and repair procedures are detailed to allow only subassembly/module level repair. Because of the complexity of the individual boards and subassemblies, no one should attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs can create a safety hazard. Any indications of component replacement or printed wiring board modifications may void any warranty.

[illegible]

To properly ventilate your system, you must provide at least 3 inches (7.62 cm) of clearance at the front and back of the computer.

[illegible]

The computer is designed to be electrically grounded. To ensure proper operation, plug the AC power cord into a properly grounded AC outlet only.

[illegible]

Locating Additional Information

The following documentation is available to support these products:

- o Documentation Set
- o MS-DOS VERSION 5 REFERENCE GUIDE
- o MS OS/2 STANDARD VERSION 1.2
- o TECHNICAL REFERENCE GUIDE
- o COMPAQ SERVICE QUICK REFERENCE GUIDE
- o Service Training Guides
- o COMPAQ SERVICE ADVISORIES AND BULLETINS
- o COMPAQ QuickFind

Chapter 1 Illustrated Parts Catalog

REFER TO ADDENDUM

Chapter 2 Removal and Replacement Procedures

REFER TO ADDENDUM

This chapter provides subassembly/module-level removal and replacement procedures for the COMPAQ ProSignia PC Server. After completing all necessary removal and replacement procedures, run the DIAGNOSTICS program to verify that all components operate properly.

NOTE: Refer to the support software guide for procedures on using the COMPAQ System Configuration utility when installing or removing expansion boards, mass storage devices, and Extended Industry Standard Architecture (EISA) options.

To service the COMPAQ ProSignia Personal Computer System, you will need the following:

- o Torx T-15 screwdriver
- o Ethernet loop back plug
- o EISA Configuration software
- o Diagnostics software
- o Drive Array Advanced Diagnostics software

ELECTROSTATIC DISCHARGE INFORMATION

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

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

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

- ## REMOVAL AND REPLACEMENT PROCEDURES

[illegible][illegible]

- ## System Unit Cover Removal

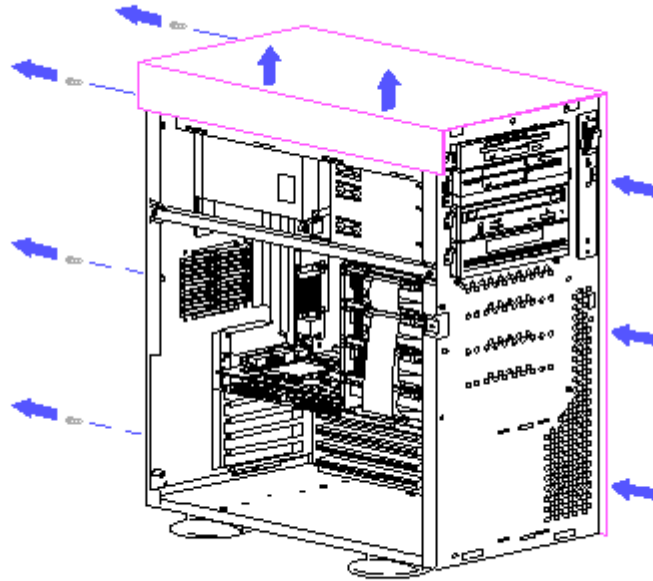


Figure 2-2. Removal of System Unit Cover

1. Remove side access door.
2. Unscrew Torx T-15 screws (4) at back panel.
3. Slide system unit cover backward and then up.
4. Reverse steps for replacing system unit cover.

Mass Storage Devices

The COMPAQ ProSignia PC Server contains two areas for mass storage devices: the removable media area and the side access drive bays.

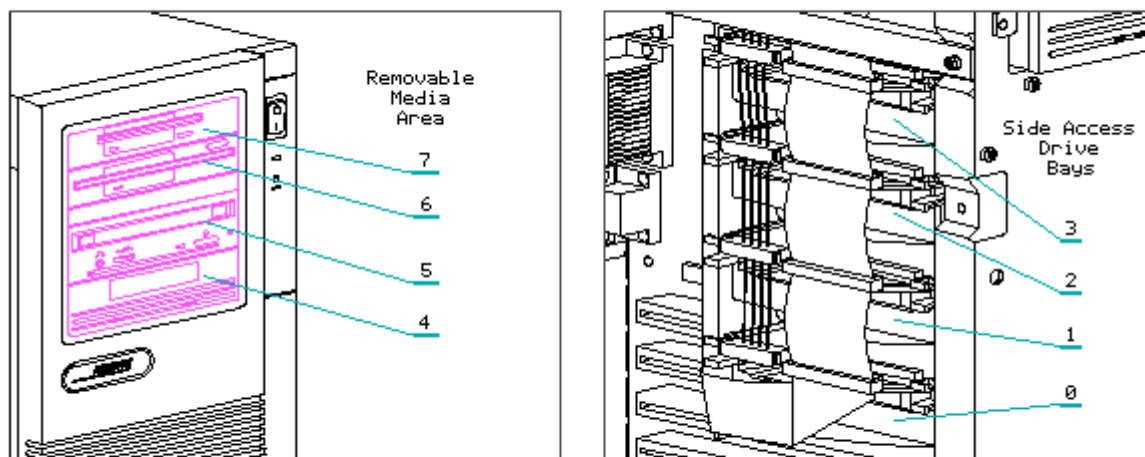


Figure 2-3. Mass Storage Device Locations and Bay Numbers

Removable Media Bays

Figure 2-3 shows the Removable Media Bays are located at the top of the unit in the front panel. Table 2-1 shows the supported mass storage devices and locations for the removable media bays.

Table 2-1. Removable Media Bay Configurations

Mass Storage Device	Storage Bays			
	7	6	5	4
1.44-Megabyte Diskette Drive	X	X		
1.2-Megabyte Diskette Drive	X	X		
3.5-Inch Hard Drive		X	X	X
525-Megabyte Tape Drive		X	X	X
5.0-Gigabyte Digital Audio Tape (DAT) Drive		X	X	X

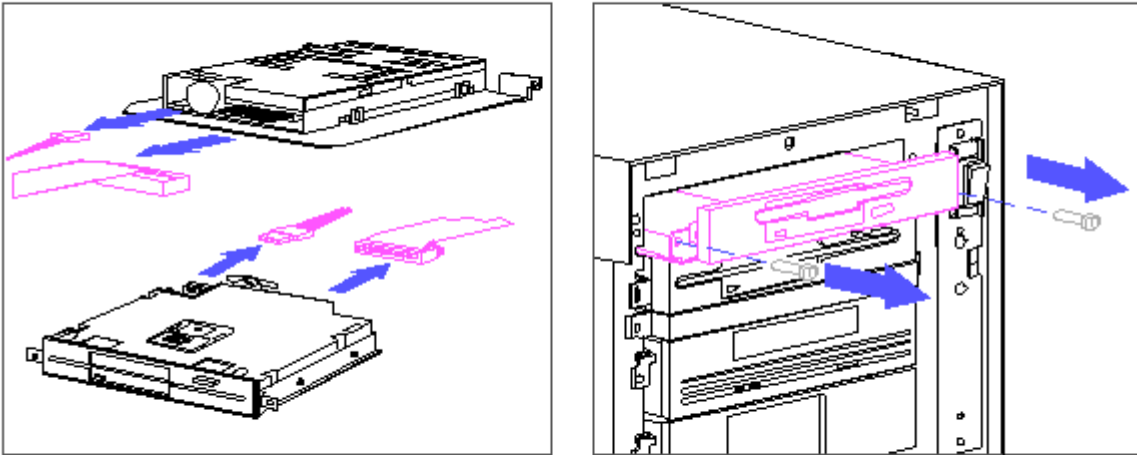


Figure 2-4. Removing a Storage Device from the QuickAccess Area

1. Remove side access door and front bezel.
2. Disconnect power and signal cables from rear of drive.
3. Remove retaining screws (2).
4. Slide mass storage device out.
5. Reverse steps for installation.

Cable Folding Diagrams for Removable Media Bays

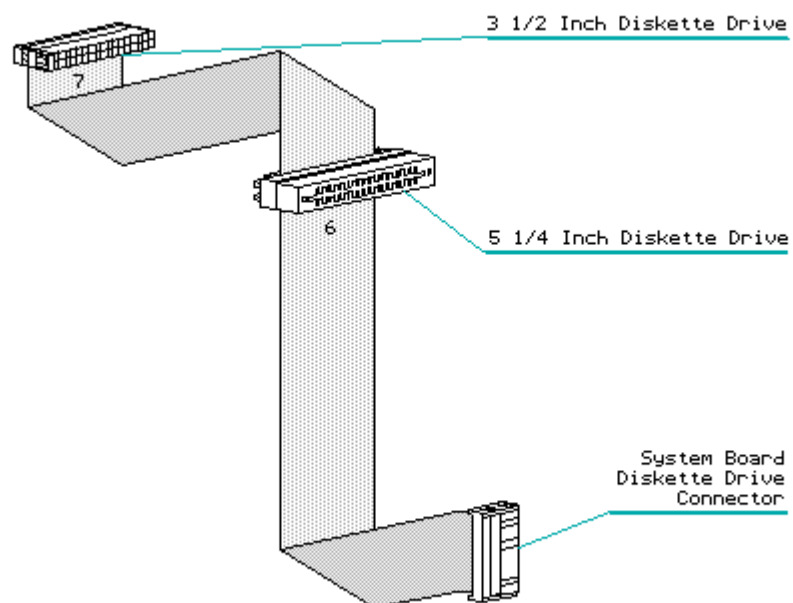


Figure 2-5. Diskette Drive Cable Fold (Spares Part No. 143706-001)

Side Access Drive Bays

The side access drive bay area is located behind the side access door and can hold up to four half height snap-in hard drives.

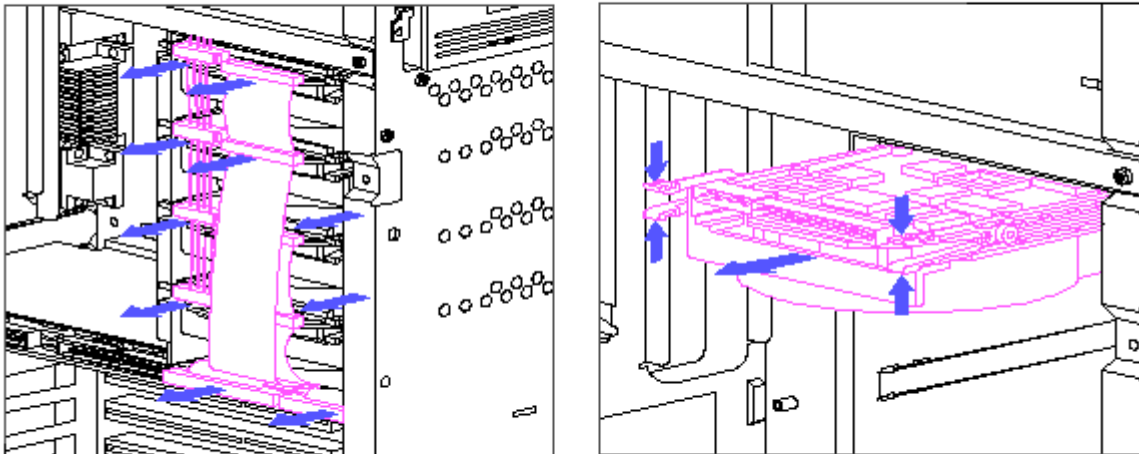


Figure 2-6. Removal of Mass Storage Device

1. Disconnect power and signal cables.
2. Remove hard drives by squeezing drive retaining clips and sliding drives out.
3. Reverse order for installing drives.

Cable Folding Diagrams for SCSI Devices and Side Access Drive Bays

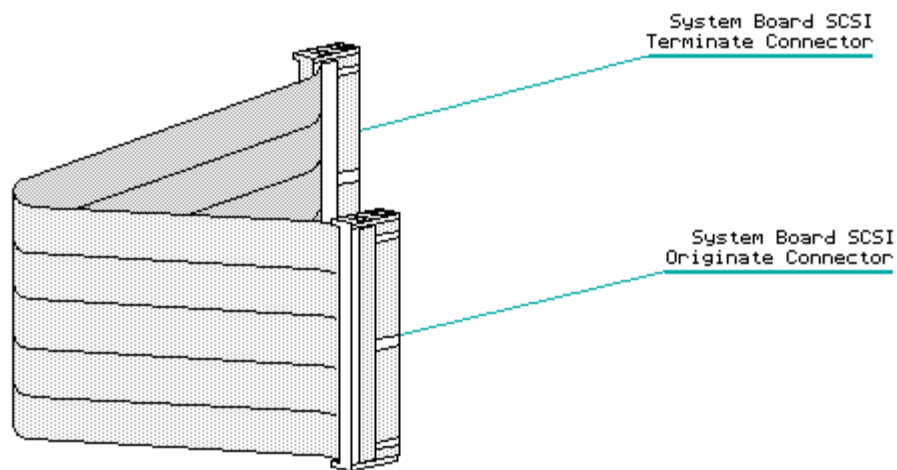


Figure 2-7. Zero-Device Terminating Cable (Spares Part No. 143715-001)

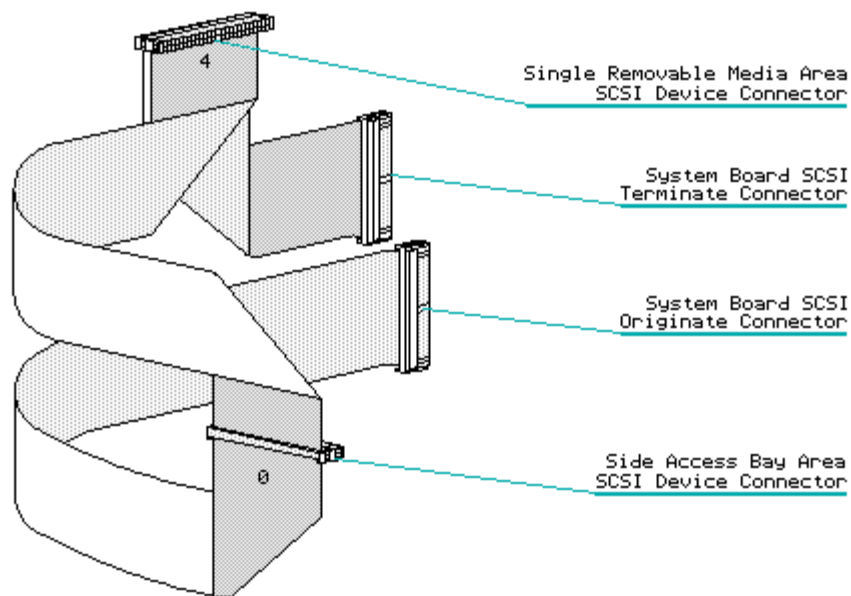


Figure 2-8. SCSI 2-Device Integrated Controller Signal Cable (Spares Part No. 144275-001)

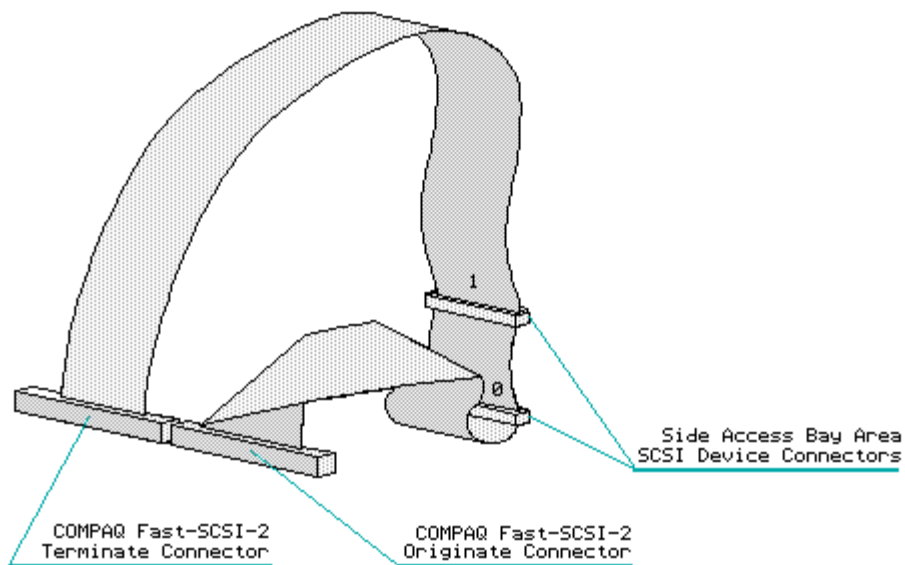


Figure 2-9. 2-Device 32-Bit Fast SCSI-2 Controller Board Signal Cable (Spares Part No. 143716-001)

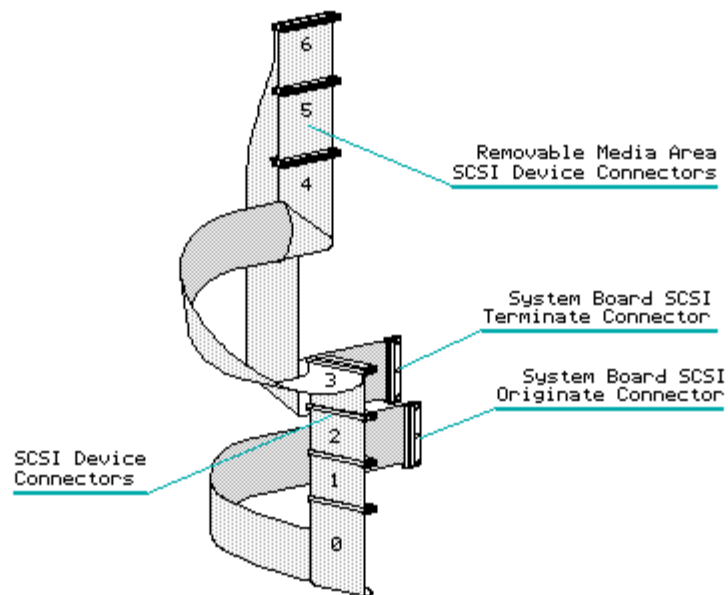


Figure 2-10. 7-Device Integrated SCSI-2 Signal Cable (Spares Part No. 144278-001)

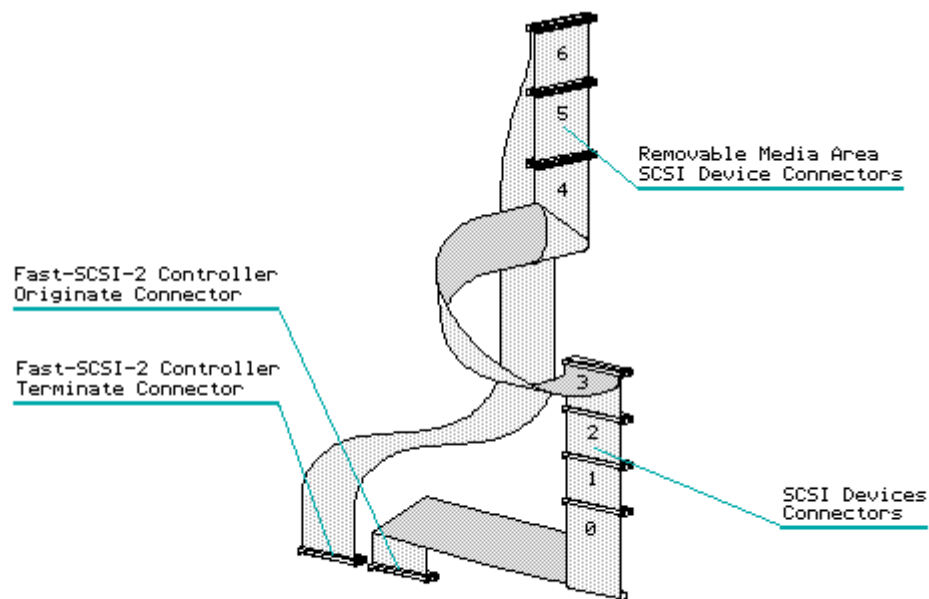


Figure 2-11. 7-Device Fast SCSI-2 Controller Board Signal Cable (Spares Part No. 144277-001)

Cable Folding Diagrams for IDE Drives

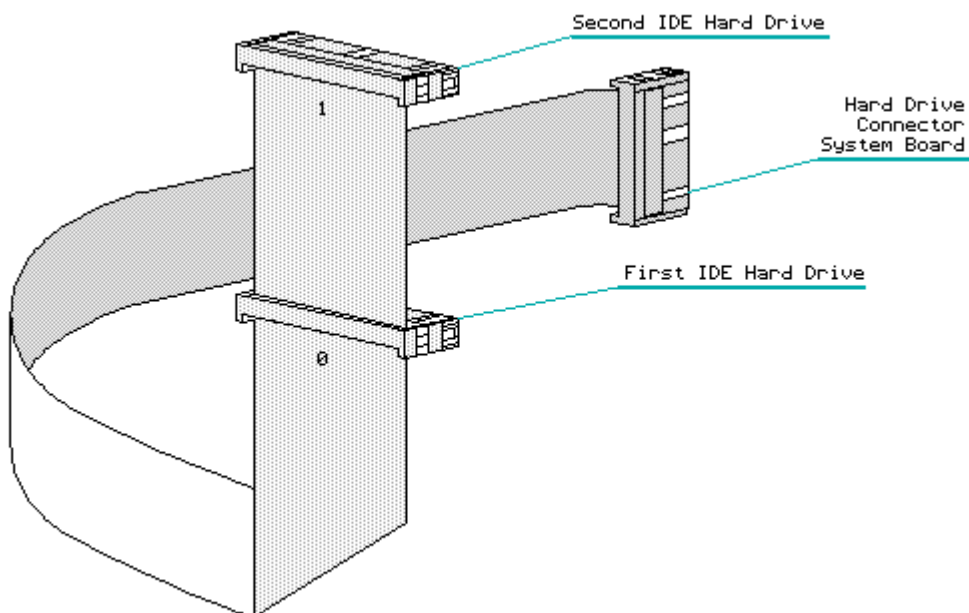


Figure 2-12. Dual IDE Hard Drive Signal Cable (Spares Part No. 143707-001)

Cable Folding Diagrams for IDA-2 Drives

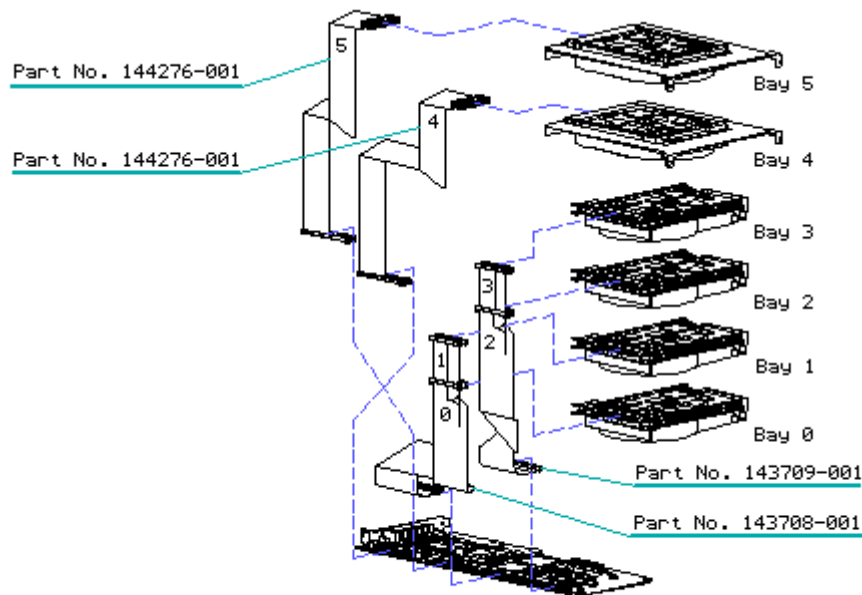


Figure 2-13. IDA-2 Hard Drive Signal Cables
 (Side Access Bays 0 and 1) Spares Part No. 143708-001
 (Side Access Bays 2 and 3) Spares Part No. 143709-001
 (Removable Media Bays 4 or 5) Spares Part No. 144276-001

Boards

Memory

The COMPAQ ProSignia PC Server comes standard with either 4 or 8 megabytes of system memory (depending on model). Memory can be expanded to a maximum of 128 megabytes by installing any combination of 1-, 2-, 4-, 8-, 16-, or 32-Megabyte industry-standard SIMM modules in the four SIMM sockets on the system board.

NOTE: The COMPAQ ProSignia supports a maximum of 128 MB of system RAM. The standard 4 or 8 megabytes of system board memory will be ignored if all 4 SIMM sockets have 32-MB SIMMs installed.

NOTE: COMPAQ only supports 16-MB SIMMS that use 16-megabit DRAM chips. SIMM modules that use 4-megabit DRAM chips are not supported.

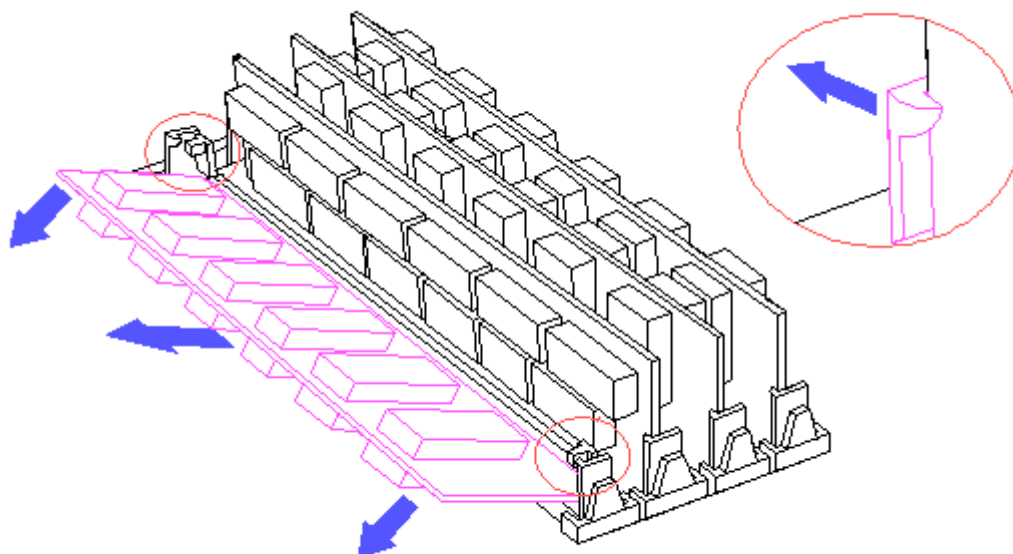


Figure 2-14. Removal of SIMM Module

1. Remove all cables located near memory connectors.
2. Press SIMM connector latches outward.
3. Tilt SIMM module forward.
4. Lift SIMM module out.
5. To replace SIMM module reverse steps.
6. Run COMPAQ EISA Configuration utility if installed memory size has changed.

Table 2-2 shows a sample of typical memory configurations for the COMPAQ ProSignia PC Server.

Table 2-2. Example of SIMM Upgrade Combinations

Total Memory	Standard System Memory	SIMM Socket 1	SIMM Socket 2	SIMM Socket 3	SIMM Socket 4
8 MB	4 MB	4-MB			
12 MB	4 MB	4-MB	4-MB		
16 MB	4 MB	8-MB	4-MB		
24 MB	4 MB	16-MB	4-MB		
36 MB	4 MB	32-MB			
52 MB	4 MB	32-MB	16-MB		
60 MB	4 MB	32-MB	16-MB	8-MB	
68 MB	4 MB	32-MB	32-MB		
76 MB	4 MB	32-MB	32-MB	8-MB	
84 MB	4 MB	32-MB	32-MB	16-MB	
92 MB	4 MB	32-MB	32-MB	16-MB	8-MB
100 MB	4 MB	32-MB	32-MB	32-MB	

116 MB	4 MB	32-MB	32-MB	32-MB	16-MB
128 MB	4 MB *	32-MB	32-MB	32-MB	32-MB
12 MB	8 MB	4-MB			
16 MB	8 MB	8-MB			
24 MB	8 MB	16-MB			
36 MB	8 MB	16 MB	8-MB	4-MB	
40 MB	8 MB	32-MB			
56 MB	8 MB	32-MB	16-MB		
64 MB	8 MB	32-MB	16-MB	8-MB	
72 MB	8 MB	32-MB	32-MB		
88 MB	8 MB	32-MB	32-MB	16-MB	
104 MB	8 MB	32-MB	32-MB	32-MB	
112 MB	8 MB	32-MB	32-MB	32-MB	8-MB
120 MB	8 MB	32-MB	32-MB	32-MB	16-MB
128 MB *	8 MB *	32-MB	32-MB	32-MB	32-MB

* The standard 4 or 8 megabytes of system board memory will be ignored if all 4 SIMM sockets have 32-MB SIMMs installed.

Option Boards

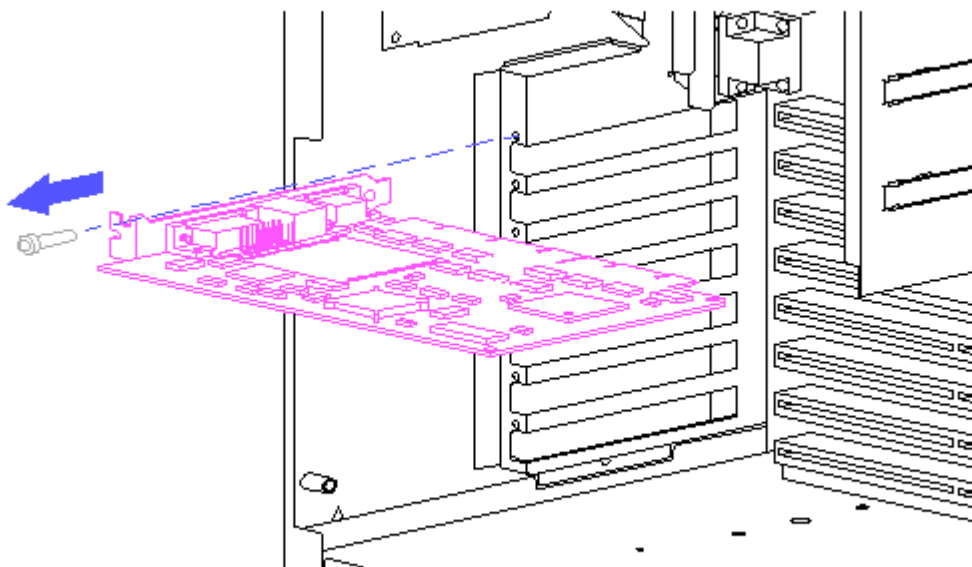


Figure 2-15. Removal of Option Board

1. Remove any cables connected to board.
2. Remove retaining screw.
3. Pull board straight out.

System Board

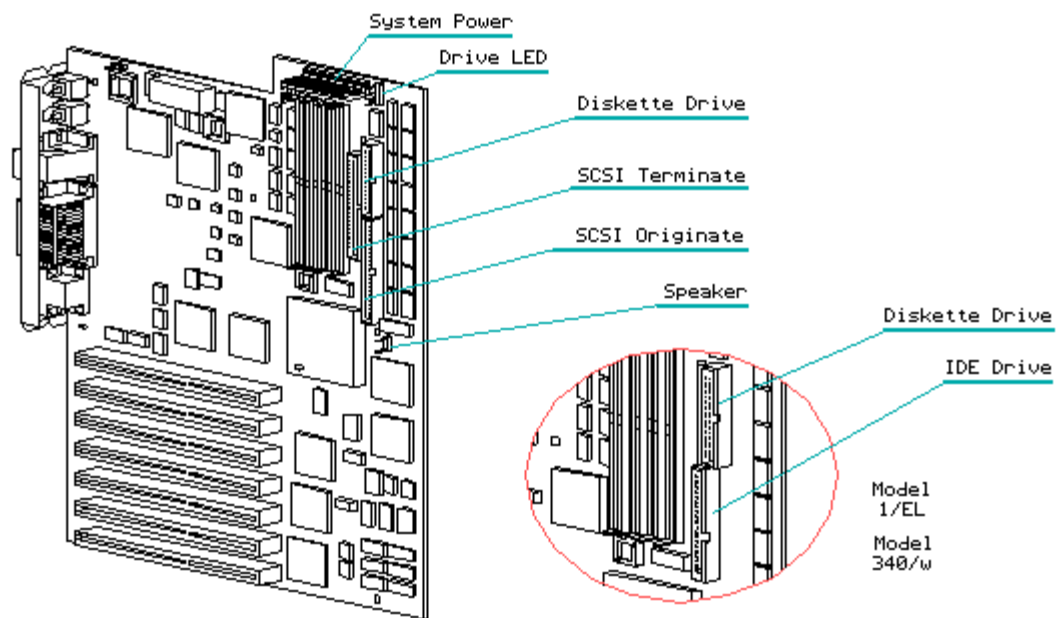


Figure 2-16. System Board Connectors

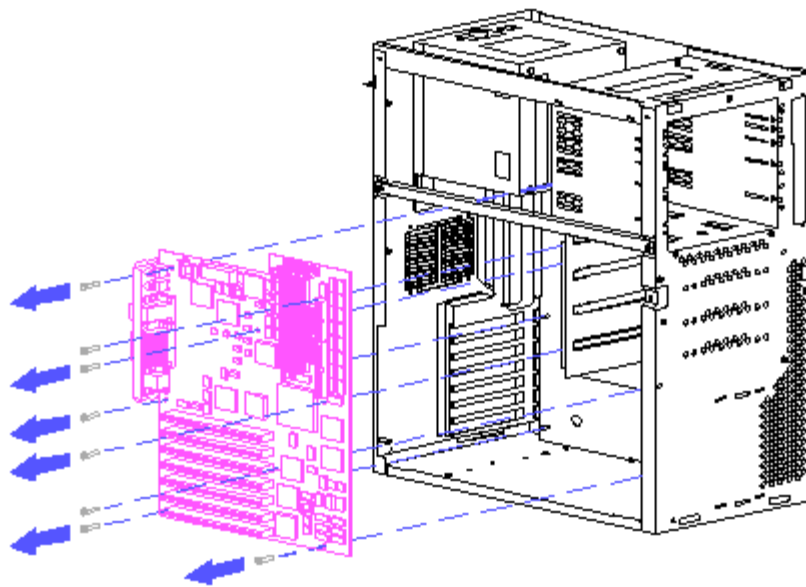
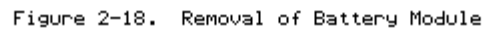


Figure 2-17. Removal of System Board

1. Remove all expansion boards.
2. Disconnect all cables from system board (Refer to Figure 2-16).
3. Remove retaining screws (8).
4. Lift board out being careful to avoid chassis and loose cables.
5. Reverse order to replace system board.

MISCELLANEOUS PARTS

Removing the Battery/Clock Module



The battery/clock module contains a lithium battery that may explode if mishandled. Do not abuse, recharge, disassemble, or dispose of in fire or heat above 90oC, incinerate, or expose to water or fire. Use only replacement battery/clock modules supplied by Compaq Computer Corporation (part no. 107872-001). Disposal of the battery/clock module should be accomplished within compliance of local regulations or returned to Compaq Computer Corporation by established parts return methods.

NOTE: After replacing battery the COMPAQ EISA Configuration utility must be run.

Power Supply

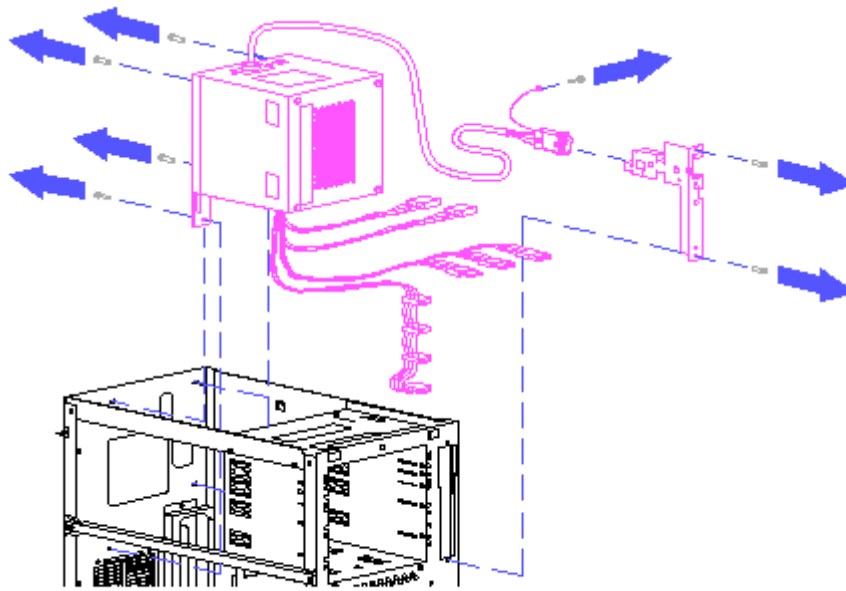


Figure 2-19. Removal of Power Supply

1. Turn power off and remove power cord from rear of unit.
2. Remove side access panel/front bezel/system unit cover.
3. Disconnect all power connectors from boards and or peripheral devices.
4. Remove front power switch bracket retaining screws (2).
5. Pull bracket out and remove power switch, grounding connector, and cable from bracket.
6. Remove screws at rear of power supply (4).
7. Lift power supply out pulling switch and cable through chassis.
8. Reverse order for replacement.

NOTE: When replacing power supply, make sure that the power switch cable is properly threaded through the bracket strain relief.

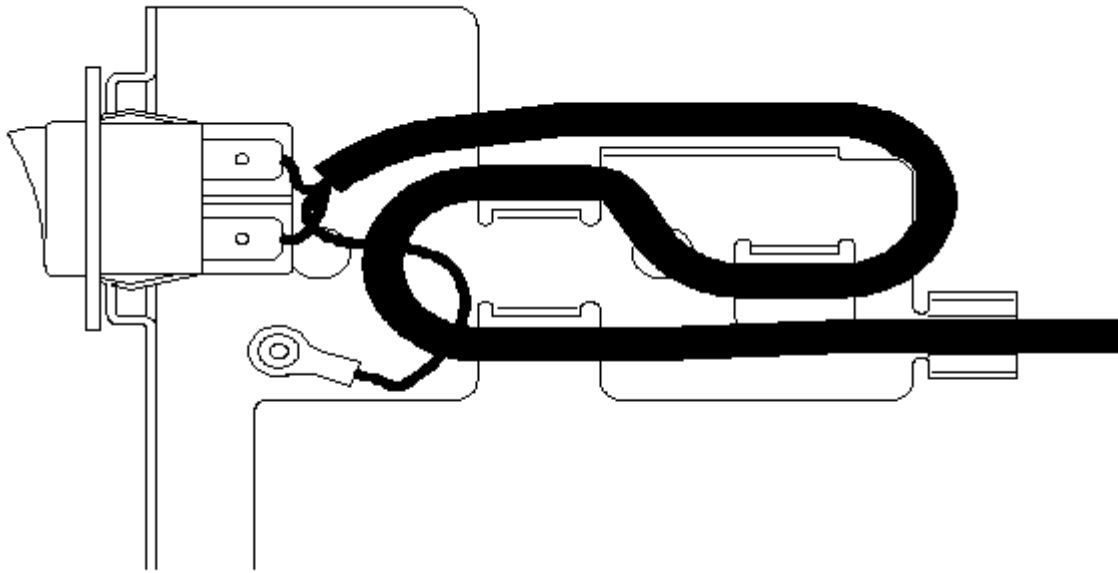


Figure 2-20. Power Supply Switch Cable Strain Relief

Chapter 3 Diagnostic Tools

This chapter describes software and firmware diagnostic tools available for COMPAQ PC Server products. These include:

- o Power-On Self-Test (POST)
- o Diagnostics (DIAGS)
- o Drive Array Advanced Diagnostics (DAAD)
- o Automatic Server Recovery
- o ROMPaq utility to upgrade flash ROMS

POWER-ON SELF-TEST (POST)

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

- o Keyboard
- o Power supply
- o System board
- o Memory
- o Memory expansion boards
- o Controllers
- o Diskette drives
- o 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 will only generate those codes which are applicable to your configuration and options.

Table 3-1. POST Error Messages

Error Code	Probable Source of Problem	Action
A Critical Error occurred prior to this power-on	A catastrophic system error, which caused the server to crash, has been logged.	Run Diagnostics. Replace failed assembly as indicated.
A Correctable Memory Error occurred prior to the power-on	Corrected Advanced ECC memory error has been logged.	No action is required. Run Diagnostics and inspect the corrected memory error. Probable SIMM failure; replace if required during scheduled maintenance.
101-ROM Error	System ROM checksum	Run Diagnostics. Replace failed assembly as indicated or, contact

your service provider.

101-I/O ROM Error	Options ROM checksum	Run Diagnostics. Replace failed assembly as indicated or, contact your service provider.
102-System Board Failure	DMA, timers, etc.	Replace the system board. Run the COMPAQ EISA Configuration Utility.
162-System Options Error	No diskette drive or mismatch in drive type	Run the EISA Configuration Utility and correct.
162-System Options Not Set	Configuration incorrect	Run the EISA Configuration Utility and correct.
163-Time & Date Not Set	Invalid time or date in configuration memory.	Run the EISA Configuration Utility and correct.
164-Memory Size Error	Configuration memory incorrect	Run the EISA Configuration Utility and correct.
170-EISA Expansion Device Not Responding	EISA Expansion board failure.	Check board for secure installation. Replace the failed board if necessary.
Error Code	Probable Source of Problem	Action
172-EISA Configuration Nonvolatile Memory Invalid Initialization Aborted	Nonvolatile configuration corrupt or jumper installed.	Run the EISA Configuration Utility and correct.
173-EISA Slot ID Mismatch	Board replaced, configuration not updated.	Run the EISA Configuration Utility and correct.
174-EISA Configuration/ Slot Mismatch Device Not Found	EISA board not found.	Run the EISA Configuration Utility and correct.
175-EISA Configuration/ Slot Mismatch Device Found	EISA board added, configuration not updated.	Run the EISA Configuration Utility and correct.
176-Slot with Not Readable ID Yields Valid ID	EISA board in slot that should contain an ISA board.	Run the EISA Configuration Utility and correct.
177-Configuration Not Complete	Incomplete EISA Configuration.	Run the EISA Configuration Utility and correct.

178-Processor Configuration Invalid	Processor type or step does not match configuration memory.	Run the EISA Configuration Utility and correct.
179-System Revision Mismatch	A board was installed which has a different revision date.	Run the EISA Configuration Utility and correct.
201-Memory Error	RAM failure	Run Diagnostics.
203-Memory Address Error	RAM failure	Run Diagnostics.
205-Processor Slot X Cache Memory Error	Cache memory error.	Replace the processor board in the slot indicated.
10 205-Memory Error	Cache memory controller or RAM failure	Run Diagnostics and replace failed assembly.
206-Processor Slot X Cache Controller Error	Cache memory controller or RAM failure.	Replace the processor board in the slot indicated.
Error Code	Probable Source of Problem	Action
207-Invalid Memory Configuration	Memory module installed incorrectly.	Verify placement of memory modules.
208-Invalid Memory Speed `xxyy -	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, 70 or 80 ns. Verify the speed of the memory modules installed and replace.
209-NCA RAM Error	RAM failure	Run Diagnostics and replace failed assembly.
212-Processor Slot X System Processor Failed	Processor in Slot X failure.	Replace the processor in the slot indicated.
213-Processor Slot X-System Processor Not Installed	System processor configured for slot indicated is missing.	Install processor in the slot indicated or run the EISA Configuration Utility to remove the processor from the .CFG file.
301-Keyboard Error	Keyboard failure.	Turn off the computer, then reconnect the keyboard.
301-Keyboard Error or	Keyboard failure.	Replace the keyboard.

Test Fixture Installed

ZZ-301-Keyboard Error	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	System board, keyboard, or mouse controller failure.	Check with your Authorized COMPAQ Reseller.
304-Keyboard or System Unit Error	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	Both external and internal ports are assigned to parallel port X	Run the EISA Configuration Utility.
Error Code	Probable Source of Problem	Action
402-Monochrome Adapter Failure	Monochrome display controller.	Replace the monochrome display controller.
501-Display Adapter Failure	Video display controller.	Replace the video board.
601-Diskette Controller Error	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.
602-Diskette Boot	Diskette in drive A not bootable.	Replace the diskette.
605-Diskette Drive Type Error	Mismatch in drive type.	Run the EISA Configuration Utility to set diskette type correctly.
607-No Response Received at Primary Address From External Floppy Controller. Internal Floppy Controller Has Enabled.	Configuration error.	Run the EISA Configuration Utility.
611-Primary Floppy Port Address Assignment Conflict	Configuration error.	Run the EISA Configuration Utility and correct.

612-Secondary Floppy Port Address Assignment Conflict	Configuration error.	Run the EISA Configuration Utility and correct.
702-A coprocessor has been detected that was not reported by CMOS.	Installed coprocessor not configured.	Run the EISA Configuration Utility and correct.
703-CMOS Reports A Coprocessor That Has Not Been Detected By POST	Coprocessor or configuration error.	1. Run the EISA Configuration Utility and correct. 2. Replace the coprocessor.
1151-COM Port 1	Both external and internal serial ports are assigned to COM1.	Run the EISA Configuration Utility and correct.
1152-COM Port 2	Both external and internal serial ports are assigned to COM2.	Run the EISA Configuration Utility and correct.
Error Code	Probable Source of Problem	Action
1153-COM Port 3	Both external and internal serial ports are assigned to COM3.	Run the EISA Configuration Utility and correct.
1154-COM Port 4	Both external and internal serial ports are assigned to COM4.	Run the EISA Configuration Utility and correct.
1701-SCSI Controller Failure	A test on the Controller failed.	Run Diagnostics. Replace failed assembly as indicated or, contact your service provider.
1771-Primary Disk Port Address Assignment Conflict	Internal and external hard drive controllers are both assigned to the primary address.	Run the EISA Configuration Utility and correct.
1772-Secondary Disk Port	Address Assignment Conflict. Internal and external hard drive controllers are both assigned to the secondary address.	Run the EISA Configuration Utility and correct.
1777-Slot # Drive Array Controller has been upgraded. Run System Configuration Utility	Configuration error.	Run the EISA Configuration Utility and correct.
1778-Slot # Drive Array resuming Automatic Data Recovery process	This message appears whenever a controller reset or power cycle occurs while Automatic	No action necessary.

Data Recovery is in progress.

1779-Slot # Drive Array Replacement drive(s) detected OR previously failed drive now appears to be operational: Drive X. Restore data from backup if replacement drive has been installed.

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

Hard drive/format error.

Run Diagnostics. Replace failed assembly as indicated or, contact your service provider.

Error Code

Probable Source of Problem

Action

1781-Disk 1 Failure

Hard drive/format error.

Run Diagnostics. Replace failed assembly as indicated or, contact your service provider.

1782-Disk Controller

Hard disk drive circuitry error.

Run Diagnostics. Replace failed assembly as indicated or, contact your service provider.

1783-Slot # Drive Array Controller Failure

Drive Array Controller is defective or not installed properly.

If message appears following a ROM installation, ROM is defective or not installed properly. Otherwise, replace the IDA-2.

1784-Slot # Drive Array Drive Failure, Physical drive replacement needed: Drive X

Defective drive and/or cables.

Check for loose cables. Replace defective drive X and/or cable(s).

1785-Slot # Drive Array Not Configured

Configuration error.

Run the EISA Configuration Utility and correct.

1786-Drive Array Recovery Needed
The following drive(s) need Automatic Data Recovery: Drive X.
Select "F1" to continue with recovery of data to drive(s). Select "F2" to continue without recovery of data to

Interim Data Recovery mode. Data has not been recovered yet.

Press F1 key to allow Automatic Data Recovery to begin. Data will automatically be restored to drive X now that the drive has been replaced or now seems to be working.
-Or-
Press the F2 key and the

drive(s) .

system will continue to
operate in the Interim
Data Recovery mode.

1787-Slot # Drive Array
Operating in Interim
Recovery Mode.
Physical drive
replacement needed:
Drive X

Hard drive X failed
or cable is loose or
defective. Following
a system restart, this
message reminds you
that drive X is
defective and fault
tolerance is being
used.

1. Replace drive X as
soon as possible.
2. Check loose cables.
3. Replace defective
cables.

Error Code

Probable Source
of Problem

Action

1788-Slot # Drive
Array Reports Incorrect
Drive Replacement
Drive(s) should have
been 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.

Drives are not
installed in their
original positions,
so the drives have
been disabled. See
note below.

Reinstall the drives
correctly as indicated.
Press F1 to restart
the computer with the
drive array disabled.
-Or-
Press F2 to use the
drives as configured
and lose all the
data on them.

NOTE: The 1788 error message might also be displayed inadvertently due to a
bad power cable connection to the drive or by noise on the data
cable. If this message was due to a bad power cable connection, but
not due to an incorrect drive replacement, repair the connection and
press F2. Or; If this message was not due to a bad power cable
connection, and no drive replacement took place, this could indicate
noise on the data cable. Check cable for proper routing.

1789-Slot # Drive Array
Physical Drive(s) Not
Responding.
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.

Cable or hard drive
failure.

1. Check the cable
connections.
2. If cables are
connected, replace
the drive.
3. If you do not
want to replace the
drives now, press
F2.

1790-Disk 0 Error

Hard drive error or
wrong drive type.

Run the EISA
Configuration Utility
and Diagnostics and
correct.

1791-Disk 1 Error

Hard drive error or

Run the EISA

wrong drive type.

Configuration Utility
and Diagnostics and
correct.

Error Code	Probable Source of Problem	Action
1792-Slot # Drive Array - Valid Data Found in Array Accelerator. Data will automatically be written to drive array.	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 shut-downs to avoid data remaining in the Array Accelerator.
1793-Slot # Drive Array - Array Accelerator Battery Depleted. Data in Array Accelerator has been lost. (Error message 1794 also displays.)	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 shut-downs to avoid data remaining in the Array Accelerator.
1794-Slot # Drive Array Accelerator Battery Charge Low. Array Accelerator is temporarily disabled. Array Accelerator will be reenabled when battery reaches full charge.	This is a warning that the battery charge is below 75%. Posted writes are disabled.	Replace the Array Accelerator board if batteries do not recharge within 36 power-on hours.
1795-Slot # Drive Array - Array Accelerator Configuration Error. Data does not correspond to this drive array. Array Accelerator is temporarily disabled.	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.	1. Match the Array Accelerator to the correct drive array. -Or- 2. Run the EISA Configuration Utility to clear the data in the Array Accelerator.
1796-Slot # Drive Array - Array Accelerator is Not Responding. Array Accelerator is temporarily disabled.	Array Accelerator is defective or has been removed.	1. Check that the Array Accelerator is properly seated. 2. Run the EISA Configuration Utility to

reconfigure the
COMPAQ IDA-2
without the Array
Accelerator.

Error Code	Probable Source of Problem	Action
1797-Slot # Drive Array - Array Accelerator Read Error Occurred. Data in Array Accelerator has been lost. Array Accelerator is disabled.	Hard parity error while reading data from posted writes memory.	Array Accelerator is disabled.
1798-Slot # Drive Array - Array Accelerator Write Error Occurred. Array Accelerator is disabled.	Hard parity error while writing data to posted writes memory.	Array Accelerator is disabled.
1799-Slot # 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 reenable logical drives.	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 reenable logical drive.
Fixed Disk Parameter Table or BIOS Error. System Halted.	Extended BIOS data area being corrupted	Contact your service provider.
IOCHECK Active, Slot X	Defective board in slot X	Run Diagnostics. Replace failed assembly as indicated.
Bus Master Time-out Slot X	Defective board in slot X	Run Diagnostics. Replace failed assembly as indicated.
Parity Check 2-System Board Memory. Parity Check 2-SIMM Memory Modules B, C, D, E	A RAM parity error occurred.	Run Diagnostics. Replace failed assembly as indicated.
(Run System Configuration Utility = "F10" key)	A configuration error occurred during POST.	Press F10 to run EISA Configuration Utility.
1600-32-Bit Server Manager/R Board Failure	Server Manager/R board failure. Error code displays after error message.	Run Diagnostics. Replace failed assembly as indicated or contact your service provider.
(RESUME = "F1" KEY)	As indicated to continue.	Press the F1 key.
=====		

DIAGNOSTICS (DIAGS)

Diagnostic error codes occur if the system recognizes a problem while running the Diagnostics program. 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.

For assistance in the removal and replacement of a particular subassembly, see Chapter 2, "Removal and Replacement Procedures."

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 3 inches (7 to 8 cm) clearance at the front and back of the system unit.
2. Turn off the computer and peripheral devices.
3. Disconnect any peripheral devices other than the monitor and keyboard. Do not disconnect the printer if you want to test it or use it to log error messages.
4. 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 and press the Enter key.
5. 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.
6. Install an Ethernet loopback plug when instructed to by Diagnostics utility. (part no. 142054-001)
7. Run the latest version of Diagnostics.

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	Replace the processor board and retest for error codes 103-xx through 106-xx.
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

1. Replace the battery/clock module
and retest.

109-xx CMOS clock load data test
failed

2. Replace the system board and
retest.

110-xx Programmable timer load
data test failed

Replace the system board and retest
for error codes 110-xx through 113-xx.

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

The following steps apply to 114-xx
error codes:

1. Verify the speaker connection.
2. Replace the speaker and retest.
3. Replace the system board and
retest.

116-xx Cache test failed

Replace the system board and retest.

199-xx Installed devices test
failed

The following steps apply to 199-xx
error codes:

1. Check the system configuration.
2. Verify cable connections.
3. Check switch and/or jumper
settings.
4. Run the Configuration utility.
5. Replace the processor board and
retest.
6. Replace the system board and
retest.

Table 3-3. Memory Test Error Codes

Error Description
Code

Recommended Action

200-xx Invalid memory
configuration

Reinsert memory modules in correct
location.

201-xx Memory machine ID test

The following steps apply to error

	failed	codes 201-xx and 202-xx:
202-xx	Memory system ROM checksum failed	1. Replace the system ROM and retest. 2. Replace the processor board and retest. 3. Replace the memory expansion board and retest.
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	
210-xx	Random pattern test failed	

Table 3-4. Keyboard Test Error Codes

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

Table 3-5. Parallel Printer Test Error Codes

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

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	

Table 3-7. Diskette Drive Error Test 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.
601-xx	Diskette format failed	
602-xx	Diskette read test failed	

603-xx	Diskette write/read/ compute test failed	4. Replace the system board and retest.
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. 2. Run the Configuration utility.

Table 3-8. Monochrome Video Board Test Error Codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed	The following steps apply to error codes 802-xx and 824-xx:
824-xx	Monochrome video text mode test failed	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.

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 through 1109-xx: 1. Check the switch settings on the Serial/Parallel Interface board (if applicable). 2. Replace the Serial/Parallel Interface board (if applicable). 3. Replace the system board and retest.
1109-xx	Clock register test failed	

Table 3-10. Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal loopback test failed	The following steps apply to error codes 1201-xx through 1210-xx: 1. Refer to the modem documentation for correct setup procedures. 2. Check the modem line. 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 multifrequency tone test failed	
1210-xx	Modem direct connect test failed	

Table 3-11. Fixed Disk Drive Test Error Codes

Error Code	Description	Recommended Action
1700-xx	Fixed disk ID drive types test failed	The following steps apply to error codes 1700-xx through 1799-xx: 1. Run the Configuration Utility and verify the drive type. 2. Replace the fixed disk drive signal and power cables and retest. 3. Replace the fixed drive controller and retest. 4. Replace the fixed drive and retest. 5. Replace the system board and retest.
1701-xx	Fixed disk format test failed	
1702-xx	Fixed disk read test failed	
1703-xx	Fixed disk write/read/compare test failed	
1704-xx	Fixed disk random seek test failed	
1705-xx	Fixed disk controller test failed	

1708-xx Fixed disk format bad track
test failed

1709-xx Fixed disk reset controller
test failed

1710-xx Fixed disk park head test
failed

1715-xx Fixed disk head select test
failed

1716-xx Fixed disk conditional
format test failed

1717-xx Fixed disk ECC * test failed

1719-xx Fixed disk power mode test
failed

1736-xx Drive Monitoring failed

1799-xx Invalid fixed disk drive type
failed

* Error Correction Code

=====

Table 3-12. CD-ROM Drive Test Error Codes

Error Code	Description	Recommended Action
1800-xx	CD-ROM ID failed	The following steps apply to error codes 1800-xx through 1823-xx: 1. Replace the CD-ROM 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 CD-ROM drive and retest. 6. Replace the system board and retest.
1803-xx	CD-ROM Power failed	
1805-xx	CD-ROM Read failed	
1806-xx	CD-ROM SA\Media failed	
1808-xx	CD-ROM Controller failed	
1823-xx	CD-ROM random read failed	

Table 3-13. 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:

1901-xx	Tape servo write failed	1. Replace the tape cartridge and retest.
1902-xx	Tape format failed	2. Check and/or replace the signal cable and retest.
1903-xx	Tape drive sensor test failed	3. Check the switch settings on the adapter board (if applicable).
1904-xx	Tape BOT/EOT test failed	4. Replace the tape adapter board (if applicable) and retest.
1905-xx	Tape read test failed	5. Replace the tape drive and retest.
1906-xx	Tape write/read/compare test failed	6. Replace the system board and retest.

Table 3-14. Advanced VGA Board Test Error Codes

Error Code	Description	Recommended Action
2402-xx	Video memory test failed	The following steps apply to error codes 2402-xx through 2456-xx:
2403-xx	Video attribute test failed	1. Run the Configuration utility.
2404-xx	Video character set test failed	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.
2405-xx	Video 80 x 25 mode 9 x 14 character cell test failed	
2406-xx	Video 80 x 25 mode 8 x 8 character cell test failed	
2407-xx	Video 40 x 25 mode test failed	
2408-xx	Video 320 x 320 mode color set 0 test failed	
2409-xx	Video 320 x 320 mode color set 1 test failed	
2410-xx	Video 640 x 200 mode test failed	
2411-xx	Video screen memory page test failed	
2412-xx	Video gray scale test failed	
2414-xx	Video white screen test failed	
2416-xx	Video noise pattern test failed	

2417-xx Lightpen text mode test
failed, no response

2418-xx ECG/VGC memory test
failed

2419-xx ECG/VGC ROM checksum test
failed

2420-xx ECG/VGC attribute test
failed

Error Code	Description	Recommended Action
2421-xx	ECG/VGC 640 x 200 graphics mode test failed	The following steps apply to error codes 2402-xx through 2456-xx: 1. Run the 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.
2422-xx	ECG/VGC 640 x 350 16-color set test failed	
2423-xx	ECG/VGC 640 x 350 64-color test failed	
2424-xx	ECG/VGC monochrome text mode test failed	
2425-xx	ECG/VGC monochrome graphics mode test failed	
2431-xx	640 x 480 graphics test failure	
2432-xx	320 x 200 graphics (256-color mode) test failure	
2448-xx	Advanced VGA Controller test failed	
2451-xx	132-column Advanced VGA test failed	
2456-xx	Advanced VGA 256-Color test failed	
2458-xx	Advanced VGA Bit BLT Test	The following steps apply to error codes 2458-xx through 2480-xx: 1. Run Setup. 2. Replace the system board and retest.
2468-xx	Advanced VGA DAC Test	
2477-xx	Advanced VGA Data path Test	
2480-xx	Advanced VGA DAC Test	

Table 3-15. 32-Bit DualSpeed NetFlex Controller and 32-Bit DualSpeed Token Ring Controller Test Error Codes

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

*	MAU = Multistation Access Unit	
#	UTP/STP = Unshielded Twisted Pair/Shielded Twisted Pair.	

Table 3-16. Server Manager/R Board Test Error Codes

Error Code	Description	Recommended Action
7000-11	Processor (80186 Timer)	Replace the Server Manager/R board and retest for error codes 7000-11 through 7000-27.
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	Replace the Server Manager/R board and retest for error codes 7000-28 through 7000-46.
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	
Error Code	Description	Recommended Action
7000-51	mdm_int	Replace the Server Manager/R board Enhanced 2400-Baud Integrated Modem and retest for error codes 7000-51 through 7000-57.
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	Replace the Server Manager/R board Voice ROM for 7000-61 and 7000-62 error codes.
7000-62	Voice/DTMF Internal Loopback	
7000-78	Host ADC Measurements	Replace the Server Manager/R board battery for 7000-78 and 7000-79 error codes.
7000-79	Battery	

Table 3-17. Pointing Device Interface Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Pointing Device Interface test failed	The following steps apply for 8601-xx error codes:

1. Replace with a working pointing device and retest.
2. Replace the system board and retest.

DRIVE ARRAY - ADVANCED DIAGNOSTICS (DAAD)

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

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

To start DAAD:

A : DAAD

To exit without continuing, press the Esc key.

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.

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

[illegible]

This message displays the number of times that write memory parity errors were detected during transfers between the IDA-2 board transfer buffer and memory on the array accelerator board.

If there are a number of these parity errors, you may need to replace the array accelerator board.

Accelerator status: Permanently disabled

The array accelerator board has been permanently disabled. It will remain disabled until it is reinitialized using the EISA Configuration Utility.

Check the Disable Code field. Run the EISA Configuration Utility to reinitialize the array accelerator board.

Accelerator status: Possible data loss in cache

Possible data loss in cache was detected during power-up due to all of the batteries being below the sufficient voltage level and no presence of the identification signatures on the array accelerator board.

There is no way to determine if dirty or bad data was in the cache and is now lost.

Accelerator status: Temporarily disabled

The array accelerator board has been temporarily disabled.

Check the Disable Code field.

Accelerator status: Unrecognized status

A status returned from the array accelerator board that DAAD does not recognize.

Call your Authorized COMPAQ Reseller for the latest copy of DAAD.

Accelerator status: Valid data found at reset

Valid data was found in the posted write memory at re-initialization. The data will be flushed to disk.

This is NOT an error or data loss condition. No action needs to be taken.

Accelerator status: Warranty alert

A catastrophic problem has occurred with the array accelerator board. Refer to the other messages on the Diagnosis screen for the exact meaning of this message.

Replace the array accelerator board.

Battery pack X below reference voltage

The indicated battery pack is below the required voltage levels.

Allow for sufficient time for the batteries to recharge (36 hours). If the batteries have not recharged after 36 hours, replace the battery pack.

Battery X not fully charged

The 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

The IDA-2 board has been configured for use with an array accelerator board, but one is currently not attached.

Locate the original array accelerator board and attach it to the IDA-2 board.

CMOS 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 EISA Configuration Utility to reconfigure nonvolatile RAM to reflect the removal or new position.

Compatibility port problem detected

You have the compatibility port configured for this IDA controller. When DAAD was verifying this interface, a serious problem was detected.

A hardware problem has occurred and you should replace the IDA controller.

Configuration signature is zero

DAAD detected that nonvolatile RAM contains a configuration signature that is zero. Old versions of the EISA Configuration Utility could cause this.

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

Configuration signature mismatch

The array accelerator board has been configured for a different IDA-2 board. The configuration signature on the array accelerator board does not match the one stored on the IDA-2 board.

To recognize the array accelerator board, run the EISA Configuration Utility.

Controller communication failure occurred

DAAD was unable to successfully issue commands to the controller in this slot.

Check the indicators on the controller. Refer to Chapter 4 of this guide for a complete description of the indicator definitions.

Controller detected. CMOS not present

The EISA nonvolatile RAM is not configured.

Run the EISA Configuration Utility to configure the nonvolatile RAM.

Controller firmware needs upgrading

The controller firmware is below the latest recommended version.

Call your Authorized COMPAQ Reseller to obtain the latest upgraded firmware.

Controller firmware needs upgrading
(DAAD Error 102)

You have the correct controller, however, the IDA firmware should be greater than 1.26.

Call your Authorized COMPAQ Reseller to obtain the latest firmware.

Controller is not configured

The controller is not configured. If the controller was previously configured and you change drive locations, there may be a problem with the placement of the drives. DAAD examines each physical drive and looks for drives that have been moved to a different drive bay.

Look for the messages that indicate which drives have been moved. If none appear and drive swapping did not occur, run the EISA Configuration Utility to configure the controller and nonvolatile RAM. Do not run the EISA Configuration Utility if you believe drive swapping has occurred.

Controller needs replacing (DAAD Error 102)

The 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 1.14.

Replace the controller as soon as possible.

Controller reported POST error. Error Code: x

The controller returned an error from its internal Power-On Self Tests.

Replace the controller.

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 EISA Configuration Utility to configure the controller and nonvolatile RAM.

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 EISA Configuration Utility to reinitialize the array accelerator board.

Drive (bay) X needs replacing (DAAD Error 102)

The 210-megabyte hard drive installed in the computer has firmware of 2.30 or 2.31.

Replace the drive.

Drive Monitoring features are unattainable

DAAD was unable to get the monitor and performance data due to a fatal command problem such as drive time-out, or was unable to get the data due to these features not being 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 COMPAQ Diagnostics Utility 8.05 or higher 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 Diagnosis screen to determine resolution.

Drive (bay) X firmware needs upgrading

The firmware on this physical drive is below the latest recommended version.

Call your Authorized COMPAQ Reseller to obtain the latest upgraded firmware.

Drive (bay) X has invalid M&P stamp

The physical drive has invalid monitor and performance data present.

Run the latest COMPAQ Diagnostics Utility to properly initialize this drive.

Drive X indicates position Y

This message indicates which physical drive appears to be scrambled or in the wrong drive in a bay that it was originally configured for.

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.

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 CMOS

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 EISA 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 EISA Configuration Utility.

Identify logical drive data did not match with CMOS

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 EISA 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.

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 EISA

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 failure 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

Temperature failure of the Intelligent Array Expansion System drives is beyond safe operating levels and it has shut down to avoid damage.

Check the fans and the operating environment.

Logical Drive X status = OVERHEATING

The temperature of the Intelligent Array Expansion System drives is beyond safe operating levels.

Check the fans and the operating environment.

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 EISA Configuration Utility to reconfigure - you will lose data on the drive.

Mirror data miscompare

Data was found at reinitialization in the posted write memory, however, the mirror data compare test failed resulting in data being marked as invalid. Data loss is possible.

Replace the array accelerator board.

Mirrored memory location errors

Soft errors occurred when attempting to read the same data from both sides of the mirrored memory errors. 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 EISA Configuration Utility to configure the board.

Physical Drive (bay) X error occurred

This message displays detailed information on any drive errors that were returned to DAAD while issuing drive commands.

Check for other error conditions.

Physical drive (bay) X has loose cable

The array controller could not communicate with this drive at power-up. This drive has not previously failed.

Check all cable connections first. The cables could be bad, loose, or disconnected. Turn on the system and attempt to reconnect data/power cable

to the drive. If this does not work, replace the cable. If that does not work, the drive may need to be replaced.

Physical 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.

Physical 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.

Physical drive (bay) X has failed

The indicated physical drive has failed.

Replace this drive.

Physical drive (bay) X is undergoing drive recovery

This drive is being rebuilt from the corresponding mirror or parity data.

Normal operations should occur.

Physical 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 EISA Configuration Utility and try to reconfigure - data will be lost.

Set configuration command issued

The configuration of the IDA-2 has been updated. The array accelerator board remains disabled until it is reinitialized.

Run the EISA Configuration Utility to reinitialize the array accelerator board.

Soft Firmware Upgrade required

DAAD has determined that your controller is running firmware that has been soft upgraded by the COMPAQ Upgrade Utility. However, the firmware running is not present on all drives. This could be caused by the addition of new drives in the system.

Run the COMPAQ Upgrade Utility to place the latest firmware on all drives.

Threshold for drive (bay) X violated

This message indicates that a monitor and performance threshold for this drive has been violated.

Check for the particular threshold that has been violated.

Threshold violations for drive (bay) X

This is a list of the individual thresholds that have been violated for this drive.

The drive may need to be replaced. Run the COMPAQ Diagnostics Utility to determine if the drive has been initialized and the threshold violation warrants drive replacement.

Unknown disable code

A code was returned from the array accelerator board that DAAD does not recognize.

Call your Authorized COMPAQ Reseller for 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.

Wrong Accelerator

This could mean that either the adapter was replaced in the wrong slot or placed in a system that was previously configured with another adapter 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 EISA Configuration Utility to update the system configuration.

RAPID RECOVERY SERVICES

The COMPAQ ProSignia provides rapid recovery services for diagnosing and recovering from errors. These tools are available for local and remote diagnosis and recovery. The following topics are discussed here:

- o Automatic Server Recovery (ASR)
- o Server Health Logs

- o EISA Configuration History Files

NOTE: Please refer to the COMPAQ ProSignia User's Reference Guide for complete details and procedures about this diagnostic tool.

Automatic Server Recovery

The Automatic Server Recovery (ASR) feature can be optionally enabled to restart a PC Server after a critical hardware or software error has occurred. If a critical error occurs, the PC Server will record the error information in the Server Health Logs, reboot the system, and page you. You can choose to configure the system for either automatic recovery or for attended local or remote access to diagnostic and configuration tools.

NOTE: ASR is only available on operating systems using the ASR drivers provided by Compaq.

The following graphic explains how ASR works:

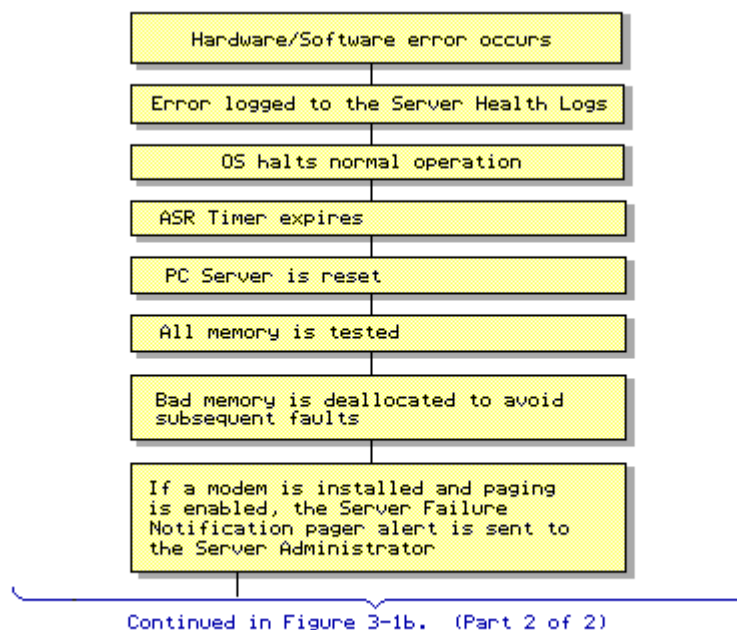


Figure 3-1a. Automatic Server Recovery (Part 1 of 2)

Continued from Figure 3-1a. (Part 1 of 2)

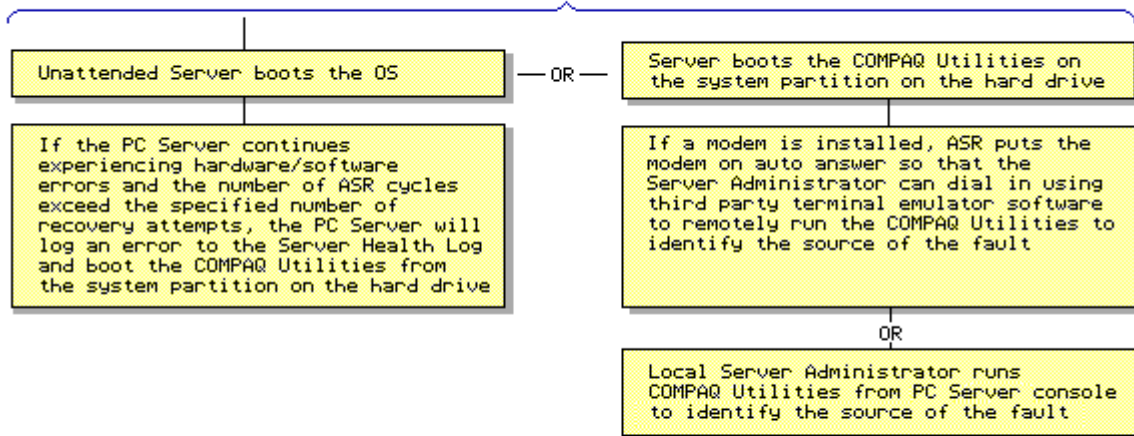


Figure 3-1b. Automatic Server Recovery (Part 2 of 2)

Configuring the PC Server for Automatic Server Recovery (ASR)

When setting up the server to use Automatic Server Recovery (ASR), you must set the ASR Timer, select the pager number to call, and specify how you want the PC Server to recover from critical system faults. This selection process is accomplished through the COMPAQ EISA Configuration Utility.

The ASR depends on an operating system driver that routinely notifies the ASR hardware that the system is operating properly. You should set the ASR Timer to allow the ASR to wait a prudent period of time before resetting the system and activating the recovery process after a fault occurs. If the time between ASR notifications by the driver exceeds the specified time period, it will assume a fault has occurred and initiate the recovery process.

For example, if the ASR Timer is set to 10 minutes, the system will not reset the PC Server unless 10 minutes elapses with no notification from the driver that the system is operating properly.

You can select to be paged (modem required) and what mode the PC Server will be in when it restarts after a critical error. The following sections describe the different reboot options and the system requirements for each level.

Unattended Recovery

For unattended recovery, ASR will log the error information to the Critical Error Log, reset the server, test all memory, automatically deallocate any bad memory blocks found, page you (if modem is present and paging is selected), and attempt to reboot the operating system. Often the PC Server will restart successfully, making this the ideal choice for remote locations where trained service personnel are not immediately available.

The ASR will only attempt the recovery process a limited number of times. If the PC Server continues to experience hardware/software errors and the number of recovery cycles exceed the retry limit, the PC Server will log an

error to the Critical Error Log and continue to boot the COMPAQ Utilities from the hard drive.

The requirements to use this level of the ASR feature are:

- o Operating system with ASR support
- o ASR configured to load the operating system after reboot
- o Optional Hayes compatible modem (only required for paging)

Attended Recovery

For local or remote installations where it is desirable to have you supervise the recovery, ASR will log the error information to the Critical Error Log, reset the PC Server, test all memory, automatically deallocate any bad memory blocks found, page you, boot the COMPAQ Utilities from the hard drive, and place the modem in auto answer mode. These utilities are placed on a special system utilities partition on the hard drive during the system configuration process. If a modem with an auto-answer feature is installed, you can dial in and remotely diagnose or reconfigure the PC Server; otherwise, this can be done from the PC Server console. The requirements to use this level of the ASR feature are:

- o Operating System with ASR support
- o EISA Configuration Utility and Diagnostics Utility installed on the system partition of the hard drive
- o ASR configured to load the COMPAQ Utilities after reboot
- o Optional Hayes compatible modem with auto-answer feature (only required for remote operations and paging)

For remote operations, the administrator must have access to a communications software package capable of terminal emulation to a local terminal with VT100 or ANSI terminal capabilities.

NOTE: If the remote site is using something other than these two packages, it is still possible to configure remotely as long as the package contains either an ANSI terminal or VT100 terminal emulator set for 8 data bits, 1 stop bit, and no parity. However, additional setup not outlined in this document may be required, and functionality may be reduced.

ASR Security

The standard COMPAQ ProSignia security password features function differently during Automatic Server Recovery than during a typical system startup.

During ASR the PC Server will not prompt for the Power-On Password. This allows the ASR to restart the Operating System or COMPAQ utilities without user intervention.

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

You should also select an Administrator Password (an option in the EISA Configuration Utility). During attended ASR (local or remote), you must enter this Administrator Password before any modifications can be made to the PC Server configuration.

Server Health Logs

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

In the event that errors occur, information about the errors are 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 noncorrectable memory errors as well as catastrophic hardware and software errors that typically cause the system to fail. This information helps you quickly identify and correct the problem, minimizing downtime.

The log can be viewed through Inspect Utility, Diagnostics Utility, or the optional INSIGHT Manager and Server Manager/R. 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. When any of these errors are encountered, you should run the Diagnostics Utility.

Table 3-18. Critical Error Log Error Messages

Error Message	Description
Automatic Server Recovery Base Memory Parity Error	The system detected a data error in base memory following a reset due to the Automatic Recovery Services (ASR) 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 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 PC Server.
Automatic Server Recovery Reset Limit Reached	The maximum number of system resets due to the ASR timer expiration has been

reached, resulting in the loading of COMPAQ Utilities.

Error Detected On Boot Up	The PC Server detected an error during the Power-On Self-Test.
NMI-Expansion Board Error	A board on the expansion bus indicated an error condition, resulting in a PC Server failure.
NMI-Expansion Bus Master Time-Out	A bus master type expansion board in the indicated slot did not release the bus after its maximum time, resulting in a PC 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 PC Server failure.
NMI-Fail-Safe Timer Expiration	Software was unable to reset the system fail-safe timer, resulting in a PC Server failure.
Processor Exception	The indicated processor exception occurred.
NMI-Processor Parity Error	The processor detected a data error, resulting in a PC Server failure.
Server Manager Failure	An error occurred in the PC Server interface with the Server Manager/R.
NMI-Software Generated Interrupt Detected Error	Software indicated a system error, resulting in a PC Server failure.

Revision History Table

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

One ART feature is the Revision History Table which contains the hardware version number of the system board and any other EISA boards providing ART-compatible revision information. The Revision History Table is stored in nonvolatile RAM and is accessed through Diagnostics, Inspect, the optional COMPAQ Server Manager/R, and the optional COMPAQ INSIGHT Manager.

The Revision History Table feature allows precise identification of the components in a PC Server. The table is updated when the system ROM detects a board version change in an EISA expansion slot. The table also contains complete version information on the previous configuration. This feature allows correlation of hardware changes with PC Server failure. The following information is stored in the Revision History Table:

- o Type of board (System or EISA)
- o Slot number
- o EISA ID

- o Version

EISA Configuration History Files

The EISA Configuration History Files are a part of the ART feature that allow you to review modifications to the system configuration.

If a change has been made to the configuration file, the EISA Configuration Utility will keep a history of the system configuration file. The EISA Configuration Utility stores the three most recent configurations.

The most recent configuration of the EISA Configuration History Log can be displayed and printed using the INSPECT utility. All three versions can be printed for historical purposes or reinstalled through the Maintain Configuration Utility feature of the EISA Configuration Utility.

ROMPaq

The use of flash ROMs in the COMPAQ ProLinea allows the firmware (BIOS) to be upgraded with the software utility ROMPaq. To upgrade the ROM, insert the ROMPaq diskette into drive A and cold boot the system. The ROMPaq utility will then check the system and provide a choice (if more than one exists) of ROM revisions that the system can be upgraded to.

[illegible]

Do not turn the power off during a firmware upgrade. A loss of power during upgrade may corrupt the upgrade.

[illegible]

Chapter 4 Switch and Jumper Information

REFER TO ADDENDUM

This chapter provides switch and jumper information for the COMPAQ ProSignia PC Server.

SYSTEM BOARD

Switch locations on the system board are shown in Figure 4-1.

Switch SW2 is a six-position switch bank (S1-S6), which controls the security features and configuration of the computer. Switch bank SW4 is a three position switch bank (S1-S3) that indicates the type and frequency of the installed microprocessor.

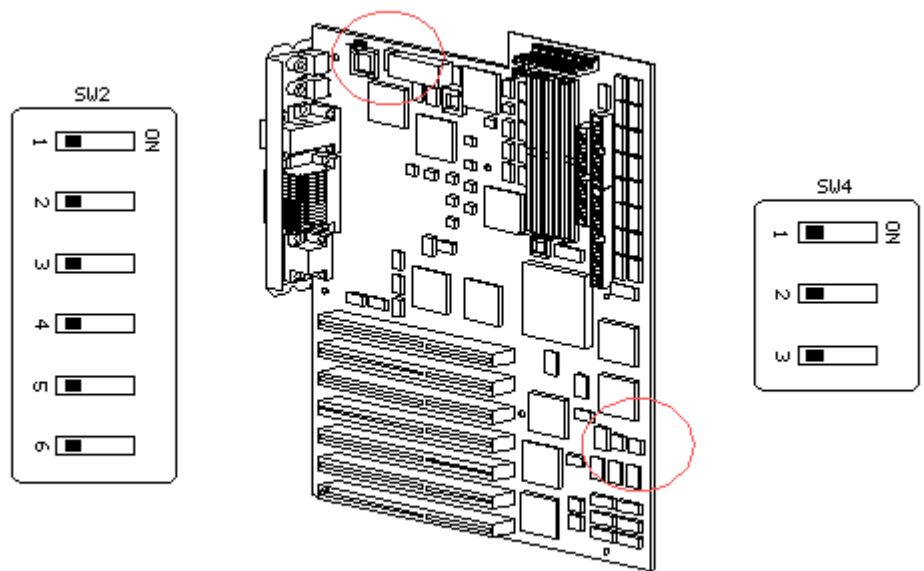


Figure 4-1. Locations of System Board Switches

Processor Selection Switch SW4

When upgrading with a new processor, the switch settings for SW4 must be changed. The settings for supported processors are defined in Table 4-1.

Table 4-1. Processor Switch Settings

Processor Installed	S1	S2	S3
486/33 or 486DX2/66	ON	OFF	ON
Overdrive Processor *	OFF	ON	ON
* When available			

System Maintenance Switch SW2

Table 4-2 defines the function for each switch setting of SW2. The default positions are shown with an asterisk.

Table 4-2. System Maintenance Switch Settings

Sw	Function	Position	Status
S1	INTEGRATED VIDEO DISABLE This switch is ignored and the integrated video is disabled if ROM detects an optional video board installed.	OFF * ON	ENABLED DISABLED
S2	LOCK CONFIGURATION System configuration cannot be changed when this switch is on (enabled).	OFF * ON	DISABLED ENABLED
S3	RESERVED	OFF *	
S4	DISKETTE BOOT OVERRIDE System can be booted from diskette drive no matter what Configuration reads when this switch is on (enabled).	OFF * ON	DISABLED ENABLED
S5	POWER-ON PASSWORD Password is set in configuration.	OFF * ON	DISABLED ENABLED
S6	MAINTENANCE. Invalidates nonvolatile RAM and configuration is cleared when this switch is on (enabled).	OFF * ON	DISABLED ENABLED

SCSI DEVICES

The 32-Bit Fast-SCSI-2 Controller requires that a SCSI ID be set for each SCSI device. The SCSI ID is set by jumpers ID2, ID1, and ID0 located on each SCSI device. Table 4-3 shows the jumper settings for each SCSI ID and its recommended drive bay. Figure 4-2 shows the physical locations of jumpers ID2, ID1, and ID0 on supported options.

Table 4-3. Jumper Settings For SCSI ID

Device in Drive Bay	SCSI ID	ID2	ID1	ID0
7	N/A	N/A	N/A	N/A
6	6	ON	ON	OFF
5	5	ON	OFF	ON
4	4	ON	OFF	OFF
3	3	OFF	ON	ON
2	2	OFF	ON	OFF
1	1	OFF	OFF	ON
0	0	OFF	OFF	OFF

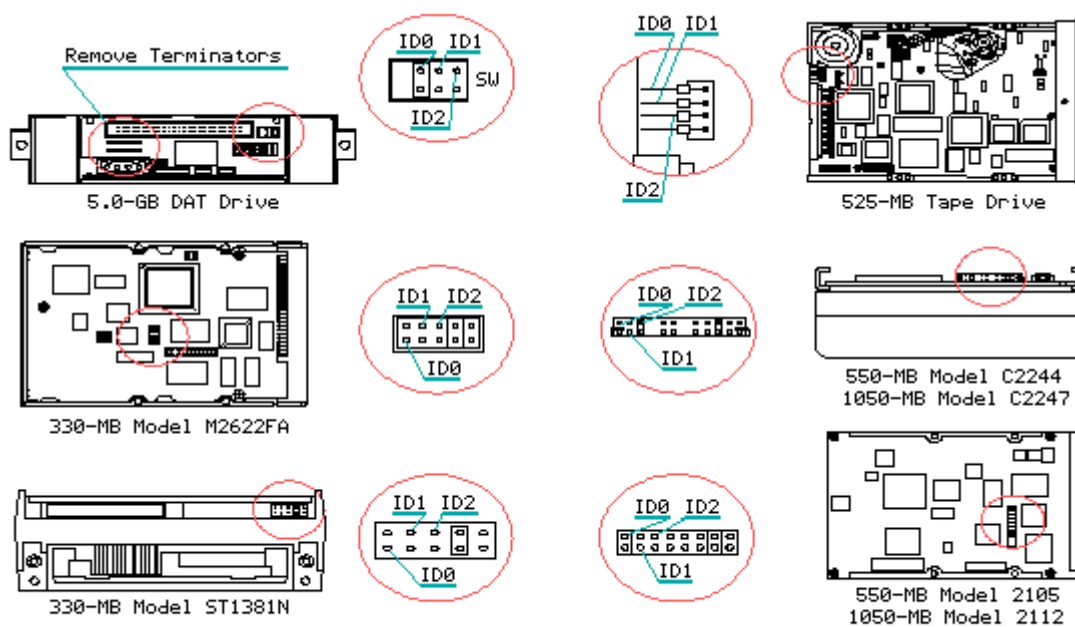


Figure 4-2. Supported SCSI Options Jumper Locations

COMPAQ 32-BIT NETFLEX CONTROLLER

The COMPAQ 32-Bit NetFlex Controller has one jumper block which selects between Ethernet or Token Ring.

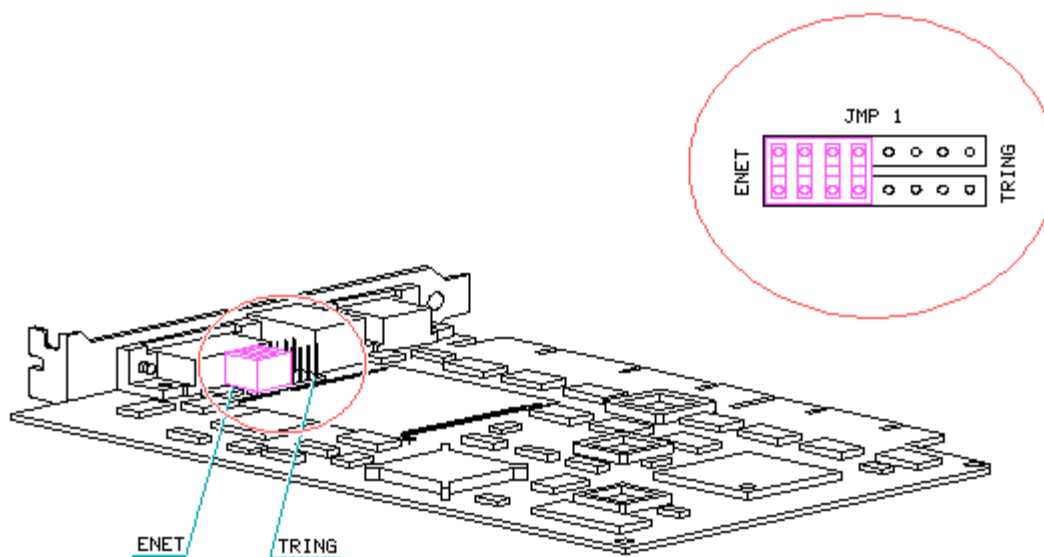


Figure 4-3. Location of 32-Bit NetFlex Controller Jumpers for Ethernet

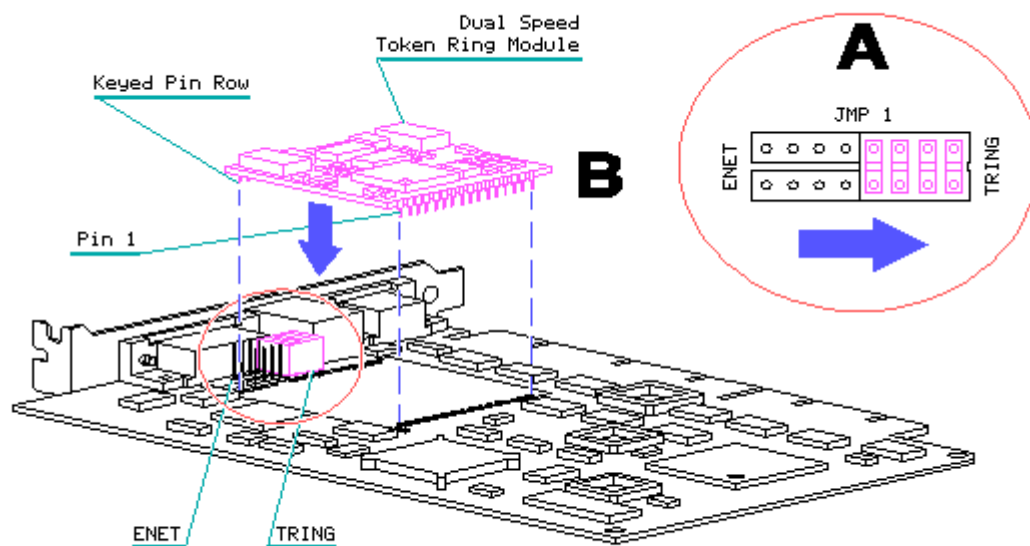


Figure 4-4. Location of 32-Bit NetFlex Controller Jumpers for Token Ring

Chapter 5 Physical and Operating Specifications

REFER TO ADDENDUM

This section provides operating and performance specifications for the following components.

- o System Unit
- o Power Supply
- o Hard Drives
- o Diskette Drives
- o SIMMs
- o IDA-2 Controller
- o Fast-SCSI-2 Controller
- o Drive Array Pairs
- o NetFlex Controller

Table 5-1. System Unit Specifications

=====		
Dimensions		
Height	21.93 in	55.8 cm
Depth	17.25 in	43.8 cm
Width	8.96 in	22.8 cm

Weight		
IDE Drive Models	37.0 lb	16.8 kg
SCSI-2 Drive Models	37.0 lb	16.8 kg
IDA-2 Models	39.5 lb	17.9 kg

Input Requirements		
Nominal Line Voltage	100-120 VAC	220-240 VAC (outside North America)
Range Line Voltage	90 to 132 VAC	180 to 270 VAC
Line Frequency	60 Hz	50 Hz (outside North America)
Current (nominal)	4.7 A	2.4 A
Fuse	6.3 A	6.3 A

Power		
Steady-State Power	240 w	240 w
Peak Power	298 w	298 w

Temperature Range		
Operating	50oF to 104oF	10oC to 40oC
Shipping	-22oF to 140oF	-30oC to 60oC

Relative Humidity (noncondensing)		
Operating	20% to 80%	20% to 80%
Nonoperating	5% to 90%	5% to 90%
=====		

Table 5-2. Power Supply Specifications

=====		
Input Specifications		
Nominal Line Voltage	100 to 120 VAC	220 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	0.6	0.6
Input Power	225 Watts	225 Watts
Input Current	4.0 at 120 VAC	2.0 at 240 VAC
Inrush Current	80 A at 132 VAC (cold start)	80 A at 264 VAC (cold start)
Holdup Time	20 ms from zero crossing at 120 VAC	20 ms from zero crossing at 120 VAC

General Specifications		
Full Output Rating	To 40oC and 5,000 ft To 32oC and 10,000 ft (derate linearly)	
Minimum Load	4.5 A on + %V Output; .04 A on 12V output	

Ambient Temperature Range		
Operating	50oF to 122oF	10oC to 50oC
Storage	-40oF to 149oF	-40oC to 65oC

Dielectric Voltage Withstand		
Input to Output	3000 VAC/ minute	
Input to Ground	1500 VAC/ minute	

Safety Standard	UL 1950; CSA 22.2 #950 or CSA 22.2 #234; TUV/VDE EN 60 950 (VDE0805/11.91); EMKO-TUE (74-SEC) 203/91	

EMI	3 dB below CISPR Publication 22 Class B; 6 dB below BMPT - AmtsblVfg 243/1991 limits; 6 dB below CFR 47, Part 15 Class B limits.	

Input Transient Susceptibility	2500 V, 1 ms, damped sinusoid 600 V, 10 ms pulse 20% step change in AC input voltage	
Common and Differential Mode (superimposed on AC line) Differential Mode		

Table 5-3. SIMM Specifications

=====	
Size	1, 2, 4, 8, 16 *, 32 MB

Speed	60, 70, 80 ns

Width	32 Bits

Upgrade Requirement	Any combination of SIMMs

Minimum Capacity	1 MB

Maximum Capacity *	128 MB #

- * COMPAQ only supports 16-MB SIMMS that use 16-megabit DRAM chips. SIMM modules that use 4-megabit DRAM chips are not supported.
- # The COMPAQ ProSignia supports a maximum of 128 MB of system RAM. The standard 4 or 8 megabytes of system board memory will be ignored if all 4 SIMM sockets have 32-MB SIMMs installed.

Table 5-4. Internal Diskette Drives

	1.44-MB (standard)	1.2-MB (optional)
Size	3 1/2-In	5 1/4-In
LED Indicators (front panel)	Green	Green
Read/Write Capacity per Diskette (high/low density)	1.44 MB/720 KB	1.2 MB/360 KB
Drive Supported	One	One
Drive Height	One-third	One-third
Drive Rotation (rpm)	300	360
Transfer Rate bits/sec (high/low)	500 K/250 K	500 K/300 K
Bytes/Sector	512	512
Sectors/Track (high/low)	18/9	15/9
Tracks/Side (high/low)	80/80	80/40
Access Times:		
Track-to-Track (high/low)	3 ms/6 ms	3 ms/10 ms
Average (high/low)	169/94 ms	148.3 ms/95 ms
Settling Time	15 ms	15 ms
Latency Average	100 ms	84 ms
Cylinders (high/low)	80/80	80/40
Read/Write Heads	Two	Two

Table 5-5. IDE Hard Drives

	510-MB	340-MB	210-MB
Height	Half	Half	Half
Size	3.5 in	3.5 in	3.5 in
Drive Type	61	63	51
Controller	Integrated	Integrated	Integrated
Logical Configuration:			
Cylinders	989	659	683
Heads	16	16	16
Sectors per Track	63	63	38
Bytes per Sector	512	512	512

Interleave	1:1	1:1	1:1
Average Seek Time (ms)	12	12	16

Table 5-6. Drive Array Specifications

	1020-MB Arrays	680-MB Arrays
Number of Drives	Two 510-MB	Two 340-MB
Size	3.5 in	3.5 in
Logical Configuration (per physical drive):		
Cylinders	989	658
Heads	16	16
Sectors per Track	63	63
Bytes per Sector	512	512
Recommended Controller	IDA-2	IDA-2
Array Transfer Rate (Mbyte/sec)	4	4
Average Data Service Rate (Requests/sec)	120	119

Table 5-7. COMPAQ 32-Bit Intelligent Drive Array Controller-2 (IDA-2)

Dimensions:		
Height	4.3 in	10.92 cm
Depth	5.0 in	12.7 cm
Width	13.2 in	33.53 cm
Total Weight	13.28 oz	131 g
Processor	16-MHz NEC V53	
Processor RAM	256-Kbyte 70-ns static RAM	
Data Transfer Buffer	128-Kbyte 25-ns static RAM	
Drives Supported	Up to six (three drive array pairs)	
Data Transfer Method	32-bit busmaster	
Maximum Transfer Rate on EISA Bus	33 MB/sec	
Simultaneous Drive Transfer Channels	Four	
Reliability Features:		
Drive Mirroring (RAID 1)	Yes	
Data Guarding (RAID 4)	Yes	
Distributed Data Guarding (RAID 5)	Yes	
Drive Failure Alert System	Audible Warning and LED Indicators	
Rear LED Indicators:		
Drive Failure	Large Amber	
Drive Activity Indicators	Green	

Controller Status Indicator	Amber
Cache Memory for Accelerator	16-bit, 4-MB, 80-ns DRAM,
Fault Tolerance	Mirrored RAM
Batteries	Eight 90 MAH Lithium Manganese Dioxide
Battery Supports Memory Without Power	8 to 10 days
POST Warning Issued	75 % charge or below
Charge	Trickle

Table 5-8. Fast-SCSI-2 Hard Drives

	1050-MB	550-MB	330-MB
Height (in/cm)	1.63 in/4.127 cm	1.63 in/4.127 cm	1.63 in/4.127 cm
Total Width (in/cm)	4.0 in/10 cm	4.0 in/10 cm	4.0 in/10 cm
Depth (in/cm)	5.75 in/14.605 cm	5.75 in/14.605 cm	5.75 in/14.605 cm
Weight (lb/kg)	2.2 lb/1.0 kg	2.2 lb/1.0 kg	2.2 lb/1.0 kg
Blocks	2,051,000	1,091,000	644,700
Access Time	11 ms	11 ms	14 ms
Rotation Speed	5400 RPM	5400 RPM	4400 RPM

Table 5-9. COMPAQ 32-Bit Fast-SCSI-2 Controller

Dimensions:		
Height	4.5 in	11.43 cm
Depth	.375 in	.95 cm
Width	10.5 in	26.67 cm
Total Weight	7.13 oz	205 g
Drives Supported	Seven	
Data Transfer Method	32-bit bus master	
SCSI Bus Transfer Rate (maximum)	10 MB/sec	
Maximum Transfer Rate on EISA Bus	33 MB/sec	
SCSI Termination	Active termination	
SCSI Connectors	1 external, 2 internal	

Table 5-10. COMPAQ 32-Bit NetFlex Controller

Dimensions

Height	5.1 in	12.9 cm
Depth	7.4 in	18.8 cm
Width	.51 in	1.3 cm

Total Weight

Ethernet Configuration	5.44 oz	150 g
Token Ring Configuration	5.76 oz	170 g

Processor

TI TMS380C26

Data Transfer Method

32-bit EISA bus master

Maximum Transfer Rate on EISA Bus

33 MB/s

Standard Network Controller Configuration - Ethernet Interface:

Meets IEEE 802.3 Specifications

Supports AUI (DB-15)

Supports 10Base-T (RJ-45)

Optional Network Controller Configuration - Token Ring Interface:

Meets IEEE 802.5 Specifications on STP cable

Meets Proposed Specifications on STP cable

Supports Token Ring Interfaces (4- or 16-megabit per second data transfer rates)

Supports STP (DB-9)

Supports UTP (RJ-45)

=====