

Maintenance and Service Guide

Compaq 2200 and 2400 Series Computers



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Online Maintenance and Service Guide
Compaq 2200 and 2400 Series Computers

August 1998


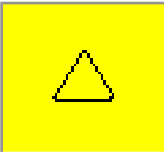
PREFACE

This *Maintenance and Service Guide* is a troubleshooting guide that can be used for reference when servicing the Compaq 2200 and 2400 Series Computers.


Compaq Computer Corporation reserves the right to make changes to the Compaq 2200 and 2400 Series Computers without notice.

Symbols

The following words and symbols mark special messages throughout this guide.

	WARNING: Text set off in this manner indicates that failure to follow directions in the warning could result in bodily harm or loss of life.
	CAUTION: Text set off in this manner indicates that failure to follow directions could result in damage to equipment or loss of data.
IMPORTANT:	Text set off in this manner presents clarifying information or specific instructions.
NOTE:	Text set off in this manner presents commentary, sidelights, or interesting points of information.

Technician Notes

	WARNING: Only authorized technicians trained by Compaq should 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, the user should not attempt to make repairs at the component level or to make modifications to any printed circuit board. Improper repairs can create a safety hazard. Any indications of component replacement or printed circuit board modifications may void any warranty.
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Serial Number

When requesting information or ordering spare parts, the computer serial number should be provided to Compaq. This can be found on the rear of the computer to the right of the power supply vent.



Locating Additional Information

The following documentation is available to support this product:

- Compaq Presario documentation set
- *Introducing Windows 95 Guide*
- Service Training Guides
- Compaq Service Advisories and Bulletins
- *Compaq QuickFind*
- *Compaq Service Quick Reference Guide*
- *Compaq Help Center*

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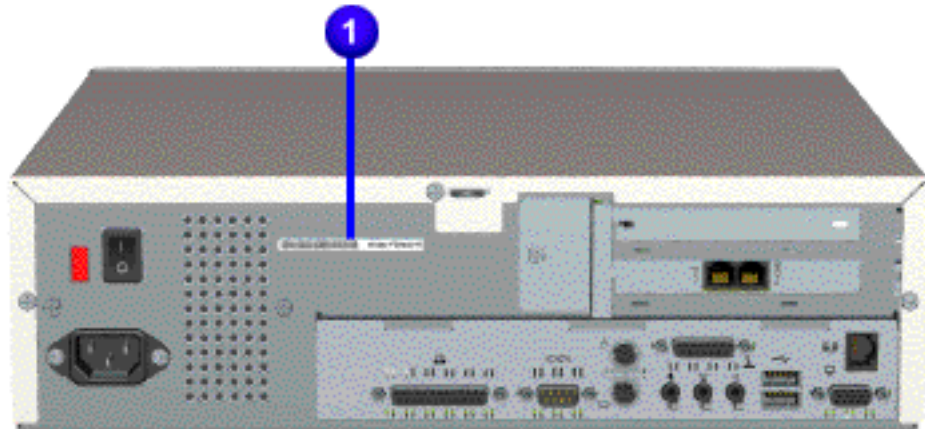
**Serial
number**

REMOVAL & REPLACEMENT

Preliminary Considerations

Serial Number

The computer serial number should be provided to Compaq whenever requesting information or ordering spare parts. The serial number is located on the rear of the unit, to the right of the power supply vent.



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Electrostatic Discharge

A sudden discharge of static electricity from a finger or other conductor can destroy static-sensitive devices or microcircuitry. Often the spark is neither felt nor heard, but damage occurs. An electronic device exposed to electrostatic discharge (ESD) may not be affected at all and will work perfectly throughout a normal cycle. Or it may function normally for a while, then degrade in the internal layers, reducing its life expectancy.

Networks built into many integrated circuits provide some protection, but in many cases, the discharge contains enough power to alter device parameters or melt silicon junctions.

Generating Static

The table below shows the different amounts of static electricity generated by different activities .

Event	Relative Humidity		
	10%	40%	55%
Walking across carpet	35,000 V	15,000 V	7,500 V
Walking across vinyl floor	12,000 V	5,000 V	3,000 V
Motions of bench worker	6,000 V	800 V	400 V
Removing DIPS from plastic tubes	2,000 V	700 V	400 V
Removing DIPS from vinyl trays	11,500 V	4,000 V	2,000 V
Removing DIPS from Styrofoam	14,500 V	5,000 V	3,500 V
Removing bubble pack from PCBs	26,000 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V
NOTE: 700 volts can degrade a product!			

Preventing Electrostatic Damage to Equipment

Many electronic components are sensitive to ESD. Circuitry design and structure determine the degree of sensitivity. The following proper packaging and grounding precautions are necessary to prevent damage:

- Protect all electrostatic parts and assemblies with conductive or approved containers or packaging.
- Keep electrostatic sensitive parts in their containers until they arrive at static-free stations.
- Place items on a grounded surface before removing them from their container.
- Always be properly grounded when touching a sensitive component or assembly.
- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

Use transporters and conveyors made of antistatic belts and metal roller bushings. Mechanized equipment used for moving materials must be wired to ground and proper materials selected to avoid static charging. When grounding is not possible, use an ionizer to dissipate electric charges.

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Preventing Damage to Drives

To prevent static damage to hard drives, use the following precautions:

- Handle drives gently, using static-guarding techniques.
- Store drives in the original shipping containers.
- Avoid dropping drives from any height onto any surface.
- Handle drives on surfaces that have at least one inch of shock-proof foam.
- Always place drives PCB assembly side down on the foam.

Grounding Methods

The method for grounding must include a wrist strap or a foot strap at a grounded workstation. When seated, wear a wrist strap connected to a grounded system. When standing, use footstraps and a grounded floor mat.

Static-Shielding Protection Levels			
Method	Antistatic Plastic	Carbon-Loaded Plastic	Metallized Laminate
Voltages	1,500	7,500	15,000

Grounding Workstations

To prevent static damage at the workstation, use the following precautions:

- Cover the workstation with approved static-dissipative material. Provide a wrist strap connected to the work surface and properly grounded tools and equipment.
- Use static-dissipative mats, heel straps, or air ionizers to give added protection.
- Handle electrostatic sensitive components, parts, and assemblies by the case or PCB laminate. Handle them only at static-free workstations.
- Avoid contact with pins, leads, or circuitry.
- Turn off power and input signals before inserting and removing connectors or test equipment.
- Use fixtures made of static-safe materials when fixtures must directly contact dissipative surfaces.
- Keep work area free of nonconductive materials such as ordinary plastic assembly aids and Styrofoam.
- Use field service tools, such as cutters, screwdrivers, and vacuums, that are conductive.
- Use a portable field service kit with a static dissipative vinyl pouch that folds out of a work mat. Also use a wrist strap and a ground cord for the work surface. Ground the cord to the chassis of the equipment undergoing test or repair.

Grounding Equipment

Use the following equipment to prevent static electricity damage to the equipment:

Wrist Straps are flexible straps with a minimum of 1 megohm ±10% resistance to the ground cords. To provide proper ground, a strap must be worn snug against the skin. On grounded mats without banana-plug connectors, connect a wrist strap with alligator clips.

Heelstraps/Toestrips/Bootstraps can be used at standing workstations and are compatible with most types of boots and shoes. On conductive floors or dissipative floor mats, use them on both feet with a minimum of 1 megohm resistance between operator and ground. To be effective, the conductive strips must be worn in contact with the skin.

Recommended Materials and Equipment

Other materials and equipment that are recommended for use in preventing static electricity include:

- Antistatic tape
- Antistatic smocks, aprons, or sleeve protectors
- Conductive bins, and other assembly or soldering aids
- Conductive foam
- Conductive tabletop workstations with ground cord of 1 megohm of resistance
- Static dissipative table or floor mats with hard tie to ground
- Field service kits
- Static awareness labels
- Wrist straps and footwear straps providing 1 megohm ±10% resistance
- Material handling packages
- Conductive plastic bags
- Conductive plastic tubes
- Conductive tote boxes
- Metal tote boxes
- Opaque shielding bags
- Transparent metallized shielding bags
- Transparent shielding tubes

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Preliminary Considerations

Service Particulars

Listed below are some details that should be kept in mind during the disassembly and reassembly of the computer.

Tool Requirements

- Phillips screwdriver
- Needle-nose pliers
- Flat-bladed screwdriver
- Compaq Utilities software

Screws

The screws used in these products are not interchangeable. If an incorrect screw is used during the reassembly process, it could cause damage to the unit. Compaq strongly recommends that all screws removed during the disassembly process be kept with the part that was removed, then returned to their proper locations.

IMPORTANT:

As each subassembly is removed from the computer, it should be placed away from the work area to prevent damage.

Cables and connectors

Most cables used throughout the unit are *ribbon cables*. These must be handled with extreme care to avoid damage. Apply only the tension required to seat or unseat the cables during insertion or removal from the connector. Handle cables by the connector whenever possible. In all cases, avoid bending, twisting, or tearing the cables, and ensure that they are placed in such a way that they cannot be caught or snagged by parts being removed or replaced.



CAUTION: When servicing these computers, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can cause severe damage to the unit.

Ribbon Cable Positions

- [CD drive](#)
- [Diskette drive](#)
- [Hard drive](#)

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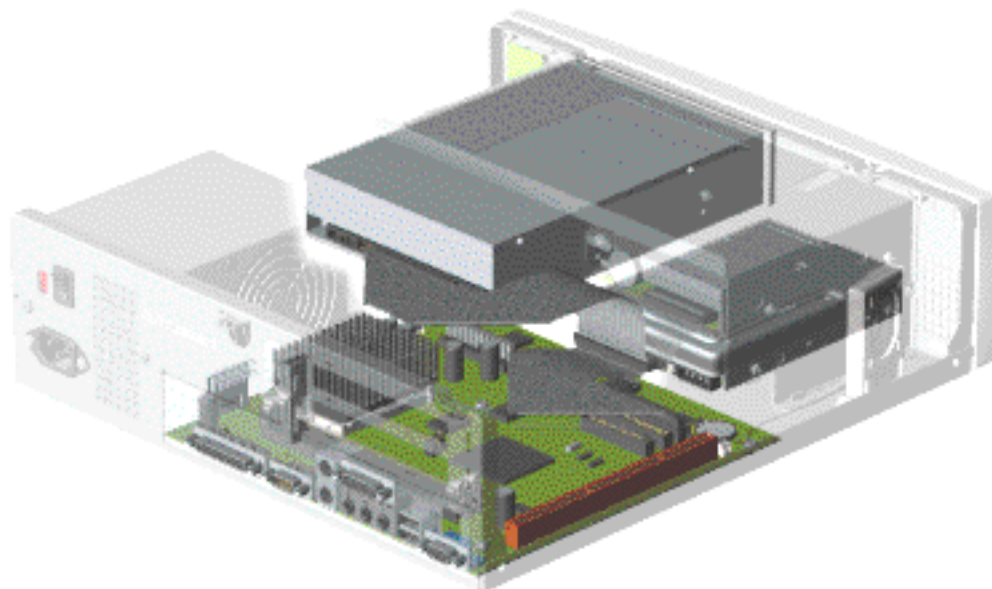
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Service Considerations - Cable Positions

CD drive (and hard drive)

This cable connects to J10 on the system board.



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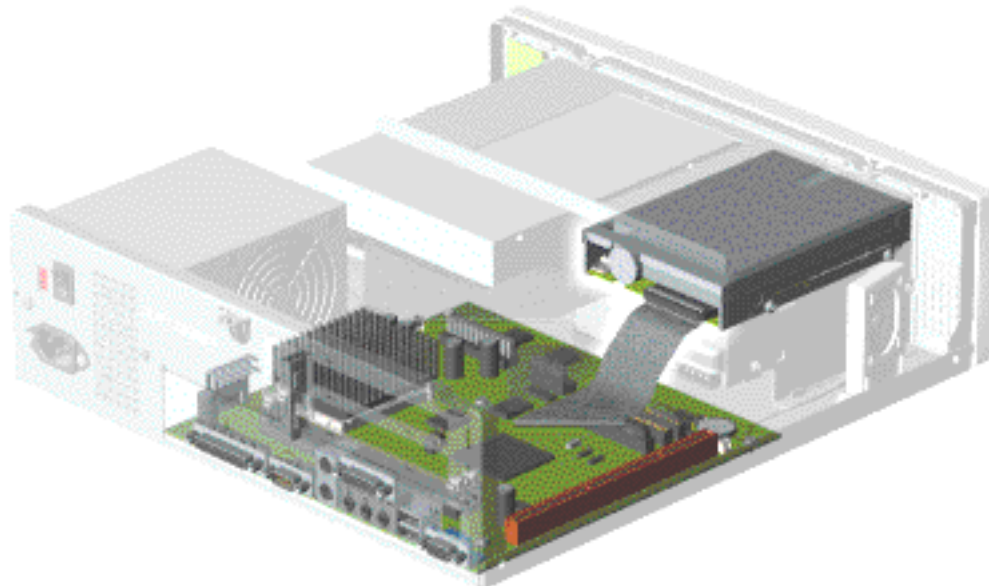
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Service Considerations - Cable Positions

Diskette drive

This cable connects to J2 on the system board.



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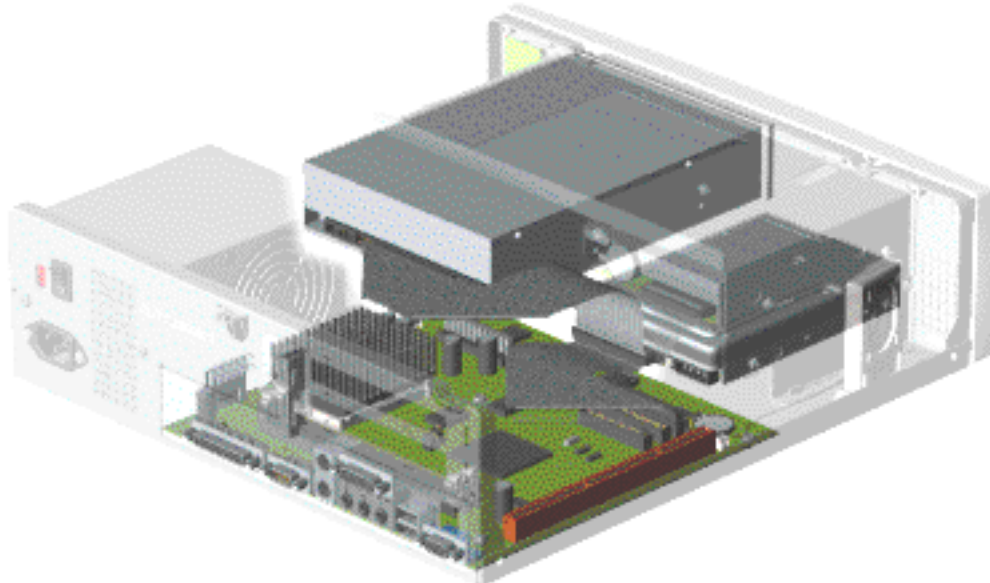
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Hard drive (and CD drive)

This cable connects to J10 on the system board.



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Preliminary Considerations

Preparation for Disassembly

To prepare the computer for removal and replacement procedures, please complete these steps:

- 1 Remove any diskette, compact disc, or tape from the computer.
- 2 Close all programs, shut down the computer, and turn off the power switch.
- 3 Turn off any peripheral devices that are connected to the computer.

NC

CAUTION: The computer power switch must be turned off before disconnecting any cables.

- 4 Disconnect the power cord from the electrical outlet, and then from the computer.



WARNING: Do not open the hood until after the power cable has been removed from the electrical outlet.

- 5 Disconnect all peripheral device cables from the computer.

IMPORTANT:

During disassembly, label each cable as you remove it. Be sure to note its position and routing.

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PRODUCT DESCRIPTION

Models and Model-Specific Features

Compaq 2200 and 2400 Series Computers
Standard Configurations

Please Note:

All models have 512kB L2 cache and a 32x CD drive.

U.S., Latin America, Canada

Model	Processor (MHz) *	Hard Drive (GB)	SDRAM (MB)	NIC

Europe, Middle East, Africa

Model	Processor (MHz) *	Hard Drive (GB)	SDRAM (MB)	NIC

Asia/Pacific, Japan

Model	Processor (MHz) *	Hard Drive (GB)	SDRAM (MB)	NIC

*Megahertz-equivalent performance level. Based upon industry-standard benchmark comparisons to the Pentium© II processor when tested in equivalently configured computer systems.

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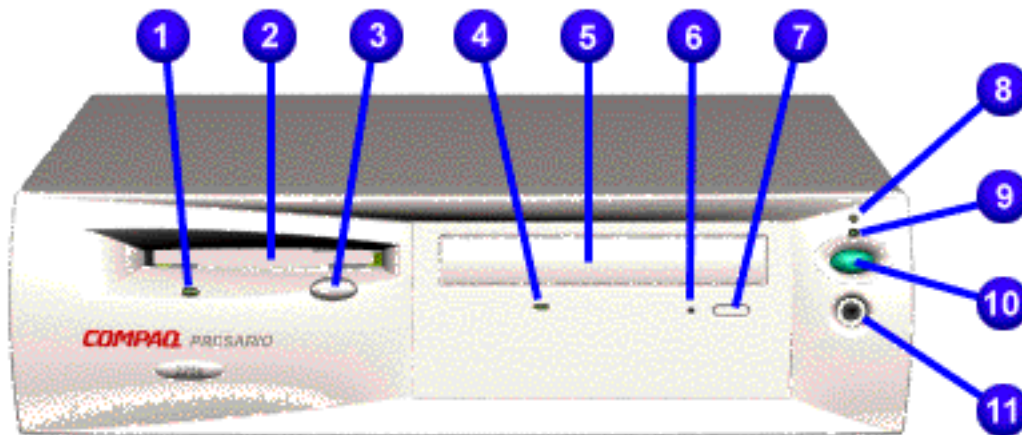
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PRODUCT DESCRIPTION

CPU Controls and Lights



1 Floppy
drive
activity
light

2 Floppy
drive
access
door

3 Floppy
diskette
eject
button

4 CD drive
activity
light

5 CD drive
tray access
door

6 Manual
eject slot

7 CD
load/eject
button

8 Hard drive
activity
light

9 Sleep
status light

10 Instant on
button

11 Headphone
socket

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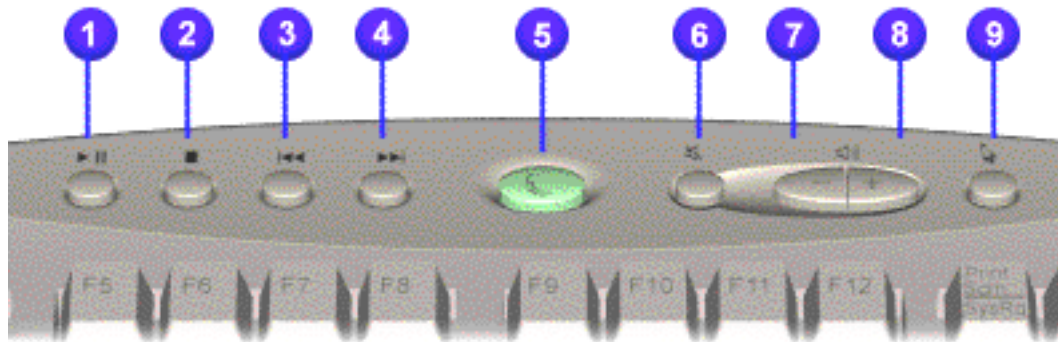
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PRODUCT DESCRIPTION

Keyboard Controls and Lights



- 1** Play/pause
- 2** Stop
- 3** Previous track
- 4** Next track
- 5** Sleep button
- 6** Mute
- 7** Volume down
- 8** Volume up
- 9** Favorite application launch

- Click here for the top center of ***Space Saver keyboard***.
- Click here for the top right corner of the ***Easy Access Internet keyboard***.

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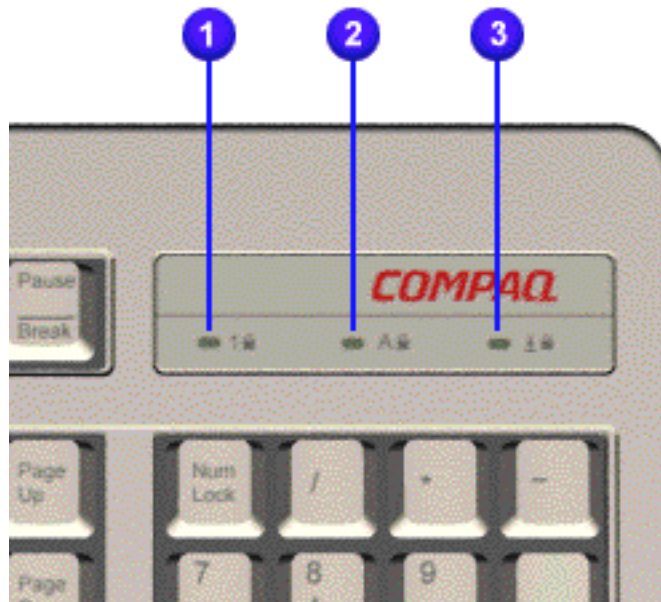
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PRODUCT DESCRIPTION

Keyboard Controls and Lights

Space Saver Keyboard



1 Num Lock Light

2 Caps Lock Light

3 Scroll Lock Light

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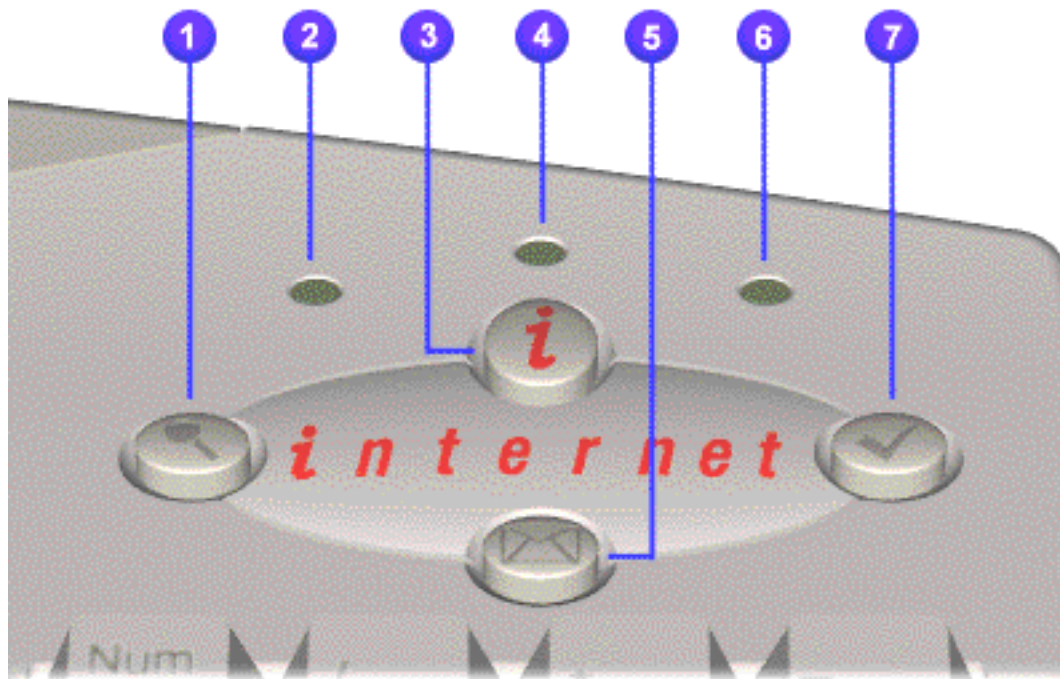
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PRODUCT DESCRIPTION

Keyboard Controls and Lights

Easy Access Internet Keyboard

Upper right corner



- 1** Instant search
- 2** Num lock light
- 3** Instant Internet
- 4** Caps lock light
- 5** Instant e-mail
- 6** Scroll lock light
- 7** Featured Web site

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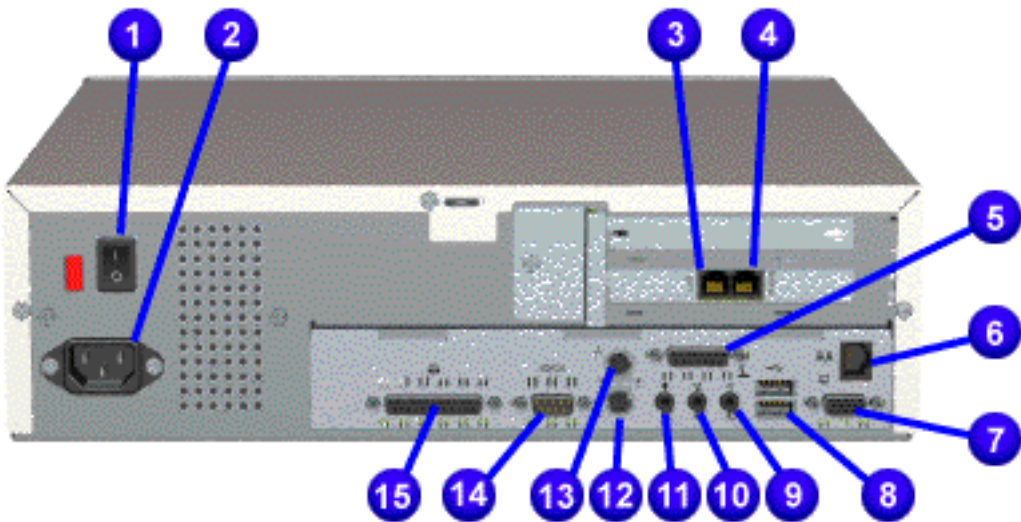
PRODUCT DESCRIPTION




CPU Rear Connectors-2200 Series Models

Click the appropriate link:

Rear connector assignments for *Educational Models 2412ES & 2416ES.*

or *2200 series* Connector pin assignments.



- 1** Main power switch (on/off)
- 2** AC power inlet
- 3** Modem or phone  (location varies)
- 4** Modem or phone  (location varies)
- 5** MIDI/gamepad/joystick
- 6** NIC  (on select models)
- 7** VGA monitor
- 8** USB (2 connectors)
- 9** Speaker out
- 10** Audio line out
- 11** Microphone
- 12** Keyboard
- 13** Mouse
- 14** Serial port
- 15** Parallel/printer port

NC

CAUTION: Do not plug a phone line into the network connector, it may damage the computer.

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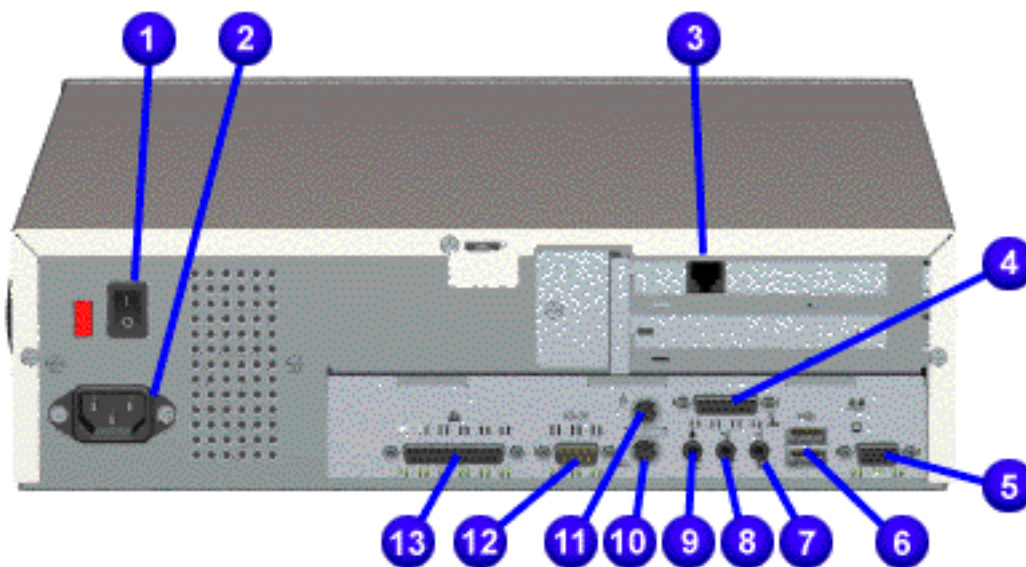
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PRODUCT DESCRIPTION

CPU Rear Connectors- 2412ES & 2416ES Models



- 1** Main power switch (on/off)
- 2** AC power inlet
- 3** NIC  (location may vary)
- 4** MIDI/gamepad/joystick
- 5** VGA monitor
- 6** USB (2 connectors)
- 7** Speaker
- 8** Audio line out
- 9** Microphone
- 10** Keyboard
- 11** Mouse
- 12** Serial port
- 13** Parallel/port printer

Click here to see the [connector pin assignments](#) .

or here to go back to [CPU rear connectors](#) main page.



CAUTION: Do not plug a phone line into the network connector, it may damage the computer

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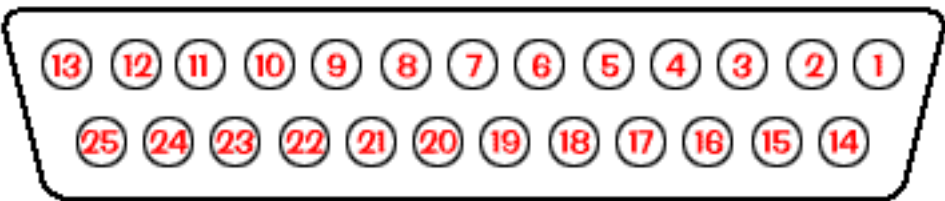
CPU Rear Connectors

Connector Pin Assignments

Click on an item to see its pin assignments:

Audio line out	Flat panel monitor	Mouse	Serial
Audio line in	Keyboard	Parallel	Speaker / headphone out
CD drive data cable	Microphone	Phone line to phone	USB
Fax/modem	MIDI/joystick	Phone line to wall jack	VGA monitor

Parallel Connector

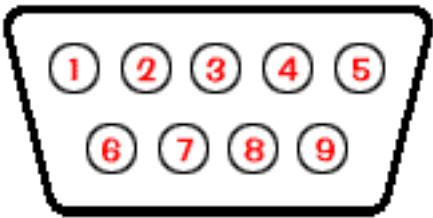


Pin	Signal	Pin	Signal	Pin	Signal
1	Strobe*	7	Data Bit 5	13	Select
2	Data Bit 0	8	Data Bit 6	14	Auto Linefeed*
3	Data Bit 1	9	Data Bit 7	15	Error*
4	Data Bit 2	10	Acknowledge*	16	Initialize Printer*
5	Data Bit 3	11	Busy	17	Select In*
6	Data Bit 4	12	Paper Out	18-25	Signal Ground

* Active low

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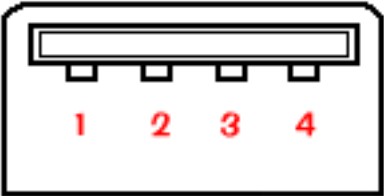
Serial Connector



Pin	Signal
1	Carrier Detect
2	Receive Data
3	Transmit Data
4	Data Terminal Ready
5	Signal Ground
6	Data Set Ready
7	Ready to Send
8	Clear to Send
9	Ring Indicator

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Universal Serial Bus



Pin	Signal
1	- Data
2	+Data
3	Ground
4	+5 VDC

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Keyboard & Mouse



Pin	Signal
1	Data
2	Unused
3	Ground
4	+5 VDC
5	Clock
6	Unused

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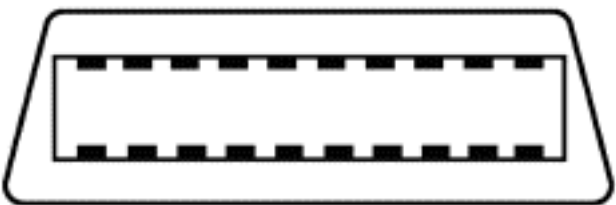
CPU Rear Connectors

Connector Pin Assignments

Click on an item to see its pin assignments:

Audio line out	Flat panel monitor	Mouse	Serial
Audio line in	Keyboard	Parallel	Speaker/headphone out
CD drive data cable	Microphone	Phone line to phone	USB
Fax/modem	MIDI/joystick	Phone line to wall jack	VGA monitor

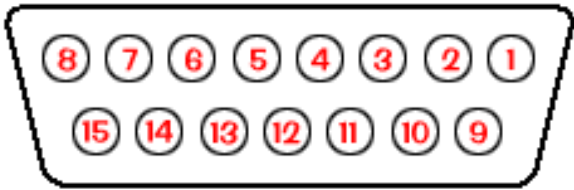
Flat-panel monitor



Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	TX2+	6	TXC+	11	TX2-	16	TXC-
2	Ground	7	Logic ground	12	Ground	17	+5VDC
3	TX1+	8	DDC data (SDA)	13	TX1-	18	DDC Clock (SCL)
4	TX0+	9	Reserved	14	TX0-	19	Reserved
5	Ground	10	Reserved	15	Ground	20	Reserved

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MIDI/Joystick



Pin	Signal	Pin	Signal	Pin	Signal
1	+5 VDC	6	Y-Axis (1)	11	X-Axis (2)
2	Fire A (1)	7	Fire B (1)	12	MIDI Out
3	X-Axis (1)	8	+5 VDC	13	Y-Axis (2)
4	Ground	9	+5 VDC	14	Fire B (2)
5	Ground	10	Fire A (2)	15	MIDI In

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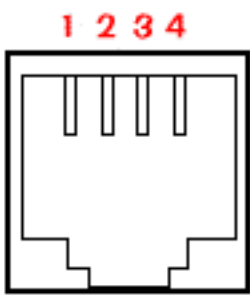
Line out
Line in
Speaker/Headphone Out
Microphone



Stereo 1/8"
Miniphone

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Phone Line to Wall Jack
Phone Line to Phone



Pin	Signal
1	Unused
2	Tip
3	Ring
4	Unused

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Internal Fax/Modem

Pin	Signal	Pin	Signal	Pin	Signal
1	Unused	3	Ring	5	Unused
2	Unused	4	Tip	6	Unused

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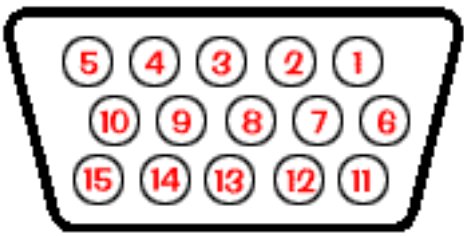
PRODUCT DESCRIPTION

CPU Rear Connectors

Connector Pin Assignments

Click on an item to see its pin assignments:

Audio line out	Flat panel monitor	Mouse	Serial
Audio line in	Keyboard	Parallel	Speaker/headphone out
CD drive data cable	Microphone	Phone line to phone	USB
Fax/modem	MIDI/joystick	Phone line to wall jack	VGA monitor



VGA Monitor

Pin	Signal	Pin	Signal
1	Red Analog	9	+5 VDC
2	Green Analog	10	Ground
3	Blue Analog	11	Volume Down
4	Volume Up	12	DDC Data
5	Ground	13	Horizontal Sync
6	Ground Analog	14	Vertical Sync
7	Ground Analog	15	DDC Clock
8	Ground Analog		

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CD Drive Data Cable

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	RESET	11	DD3	21	DMARK	31	INTRQ
2	GND	12	DD12	22	GND	32	-IOCS16
3	DD7	13	DD2	23	-DIOW	33	DA0
4	DD8	14	DD13	24	GND	34	-PDIA6
5	DD6	15	DD1	25	-DIOR	35	DA0
6	DD9	16	DD14	26	GND	36	DAZ
7	DD5	17	DD0	27	IORDY	37	-CS1FX
8	DD10	18	DD15	28	SPSYNC	38	-CS3FX
9	DD4	19	GND	29	-DMACK	39	-DASP
10	DD11	20	(KEY)	30	GND	40	GNP

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Power cord set requirements

PRODUCT DESCRIPTION

Power Cord Set Requirements

- The auto-detect feature on the computer permits it to operate from any line voltage between 120 and 240 volts AC.
- The power cord set (flexible cord and wall plug) received with the computer meets the requirements for use in the country where the computer was purchased.
- Power cord sets for use in other countries must meet the requirements of the country where you use the computer. For more information on power cord set requirements, contact your Compaq authorized dealer, reseller, or service provider.

General Requirements

The requirements listed below are applicable to *all* countries:

1	The length of the power cord set must be at least 6.00 feet (1.8 m) and a maximum of 9.75 feet (3.0 m).
2	All power cord sets must be approved by an acceptable accredited agency responsible for evaluation in the country where the power cord set will be used.
3	The power cord set must have a minimum current capacity of 10A and a nominal voltage rating of 125 or 250 volts AC, as required by each country's power system.
4	The appliance coupler must meet the mechanical configuration of an EN 60 320/IEC 320 Standard Sheet C13 connector, for mating with appliance inlet on the Switch Box.

Country-Specific Requirements

Country	Accredited Agency		Country	Accredited Agency
Australia	EANSW*		Italy	IMQ*
Austria	OVE*		Japan	JIS***
Belgium	CEBC*		Norway	NEMKO*
Canada	CSA**		Sweden	SEMKO*
Denmark	DEMKO*		Switzerland	SEV*
Finland	SETI*		United Kingdom	BSI*
France	UTE*		United States	UL**
Germany	VDE*			

* The flexible cord must be <HAR> Type HO3VV-F, 3-conductor, 1.0 mm2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

** The flexible cord must be Type SJT-2 or equivalent, No. 18 AWG, 3-conductor. The wall plug must be a two-pole grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.

*** The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. Flexible cord must be Type VCT or VCTF, 3-conductor, 0.75mm2 conductor size. The wall plug must be a two-pole type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

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REMOVAL & REPLACEMENT PROCEDURES - INDEX PAGE

This section provides general service information for **Compaq 2200 and 2400 Series Computers**.

Adherence to the procedures and precautions described in this section is essential for safe and proper service.

Preliminary considerations

electrostatic discharge
service particulars
preparation for disassembly
serial number

Hood

Button / headphone board

Front bezel

Internal speakers (ES models)

Fax-modem

NIC card (Network Interface Connector card)

Riser card (backplane)

Power supply

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drive cage
CD drive
diskette drive
hard drive
expansion bay cover

System board components

battery
memory module
processor
I/O panel
system board

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REMOVAL & REPLACEMENT PROCEDURES

Preliminary Considerations - Index Page

For maximum safety and efficiency, please read and understand these sections before attempting to repair or replace any components.

[Electrostatic discharge](#)

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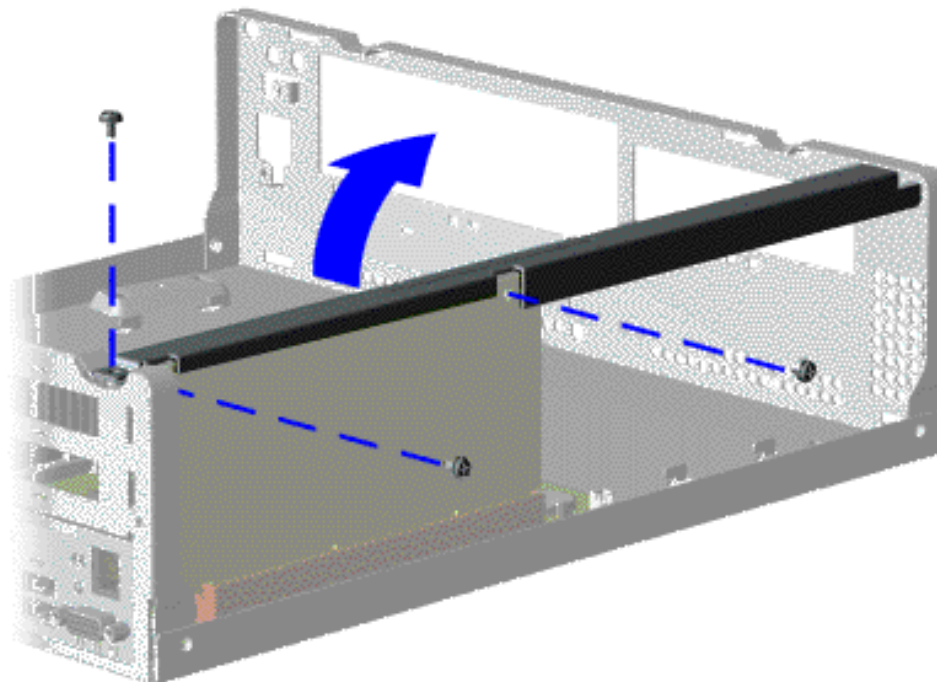
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REMOVAL & REPLACEMENT

Riser Card (Backplane)



There are ***six*** steps in this sequence.

- 1** [Perform preparation procedures.](#)
- 2** [Remove the hood.](#)
- 3** [Remove the fax-modem.](#)
- 4** [Remove the NIC card](#), if present.
- 5** Remove the three screws holding the riser card to the cross-brace bar.

[NEXT STEP](#)

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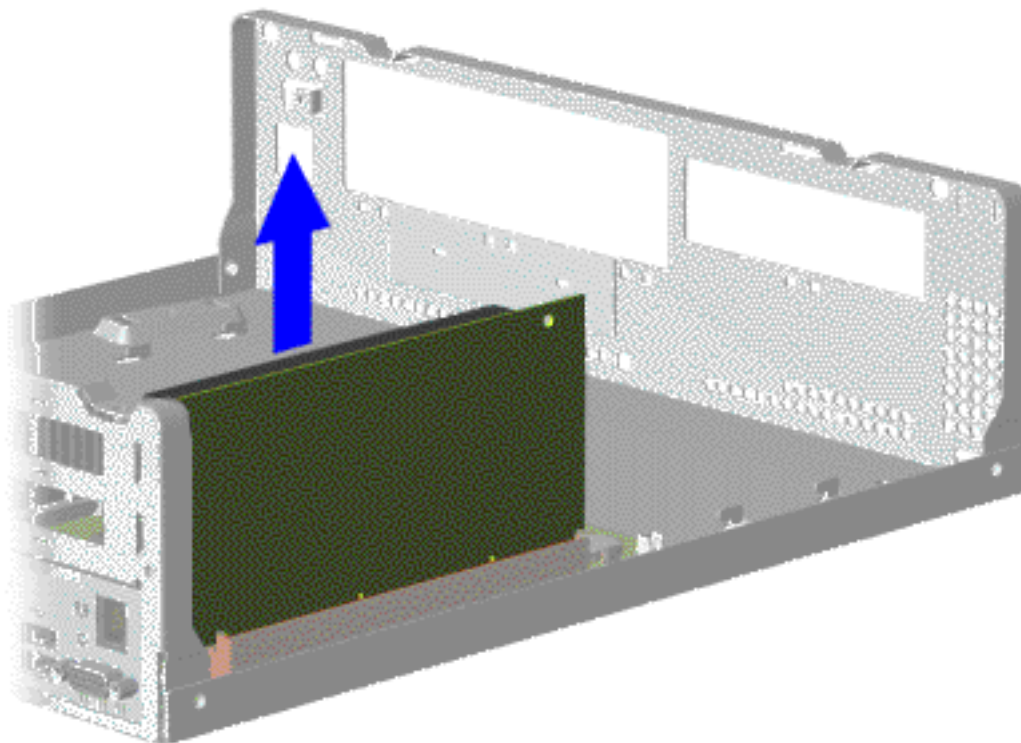
Riser Card (Backplane), continued

- 6 Pull the riser card out of the system board.

END OF SEQUENCE

To replace the riser card, reverse this sequence.

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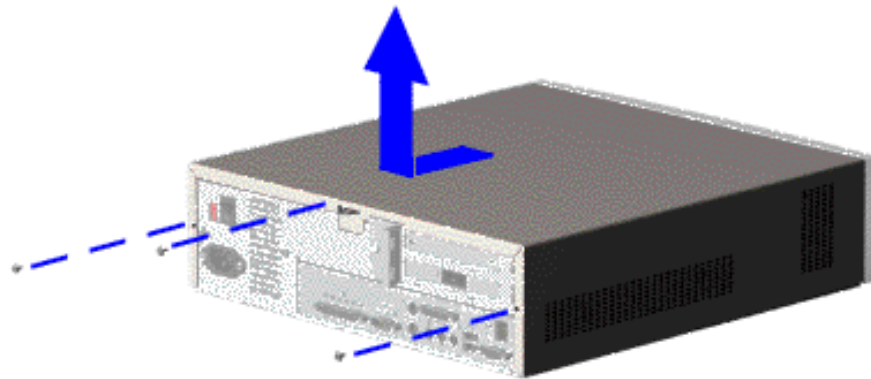
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REMOVAL & REPLACEMENT

Hood



- 1** Perform the [preparation procedures](#)
- 2** Remove the three screws at the back of the computer which hold the hood to the chassis
- 3** Grasp the handles on the bottom of the hood, pull back slightly, and lift the hood off the computer

To replace the hood, reverse this sequence.

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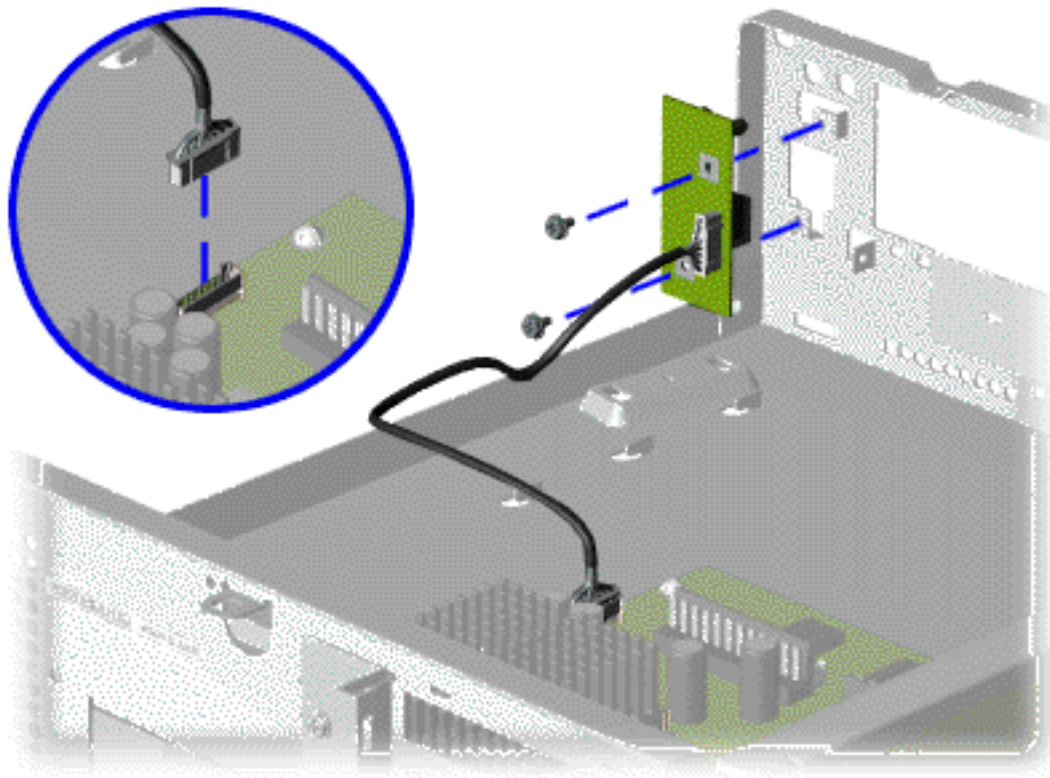
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REMOVAL & REPLACEMENT

Button / Headphone Board



- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 Disconnect the button board cable from the system board (at J27).
- 4 Remove the two screws from the button board assembly.
- 5 Pull the assembly from the rear of the front bezel.

END OF SEQUENCE

To replace the button board assembly, reverse this sequence.

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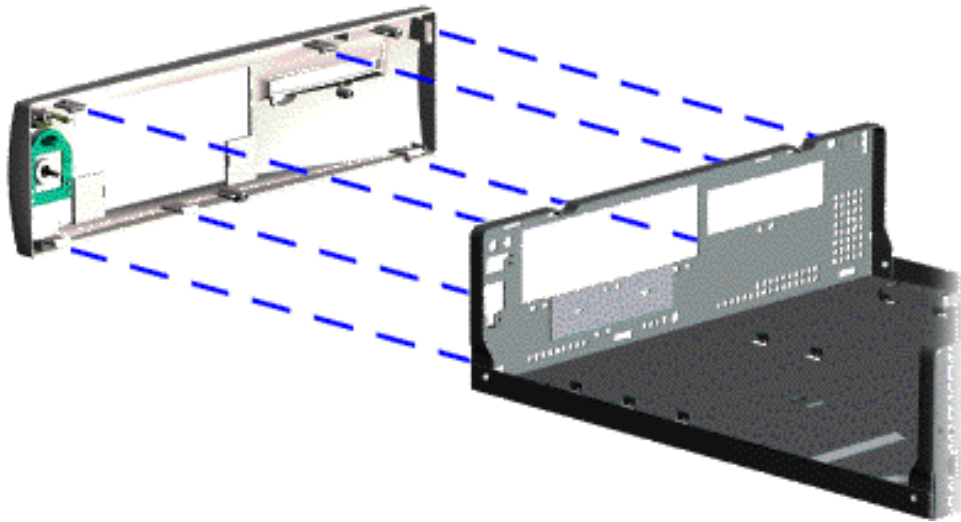
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REMOVAL & REPLACEMENT

Front Bezel



- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 [Remove the button/headphone board.](#)
- 4 [Remove the drive cage.](#)
- 5 Release the six latches, then remove the front bezel from the chassis.

To replace the front bezel, reverse this sequence.

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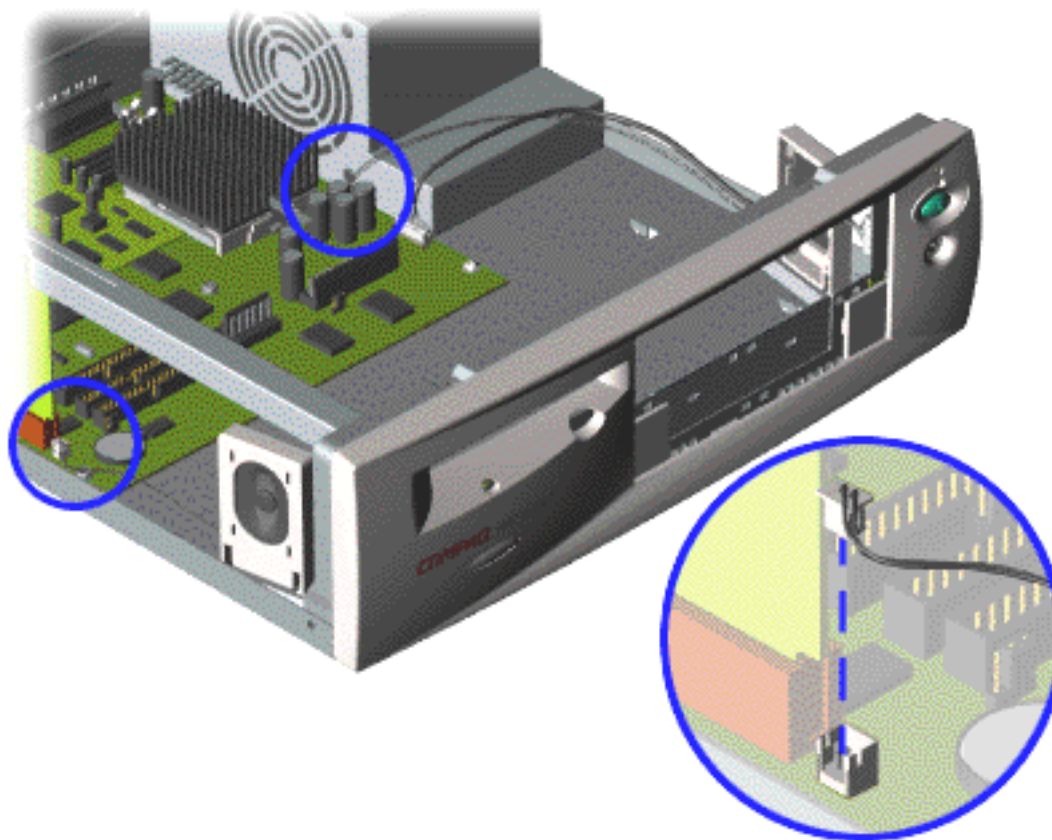
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REMOVAL & REPLACEMENT

Internal Speakers (ES models)



There are **four** steps in this sequence.

- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 Unplug the speaker cord from the connector (J25 for L, J26 for R) on the system board.

NEXT STEP

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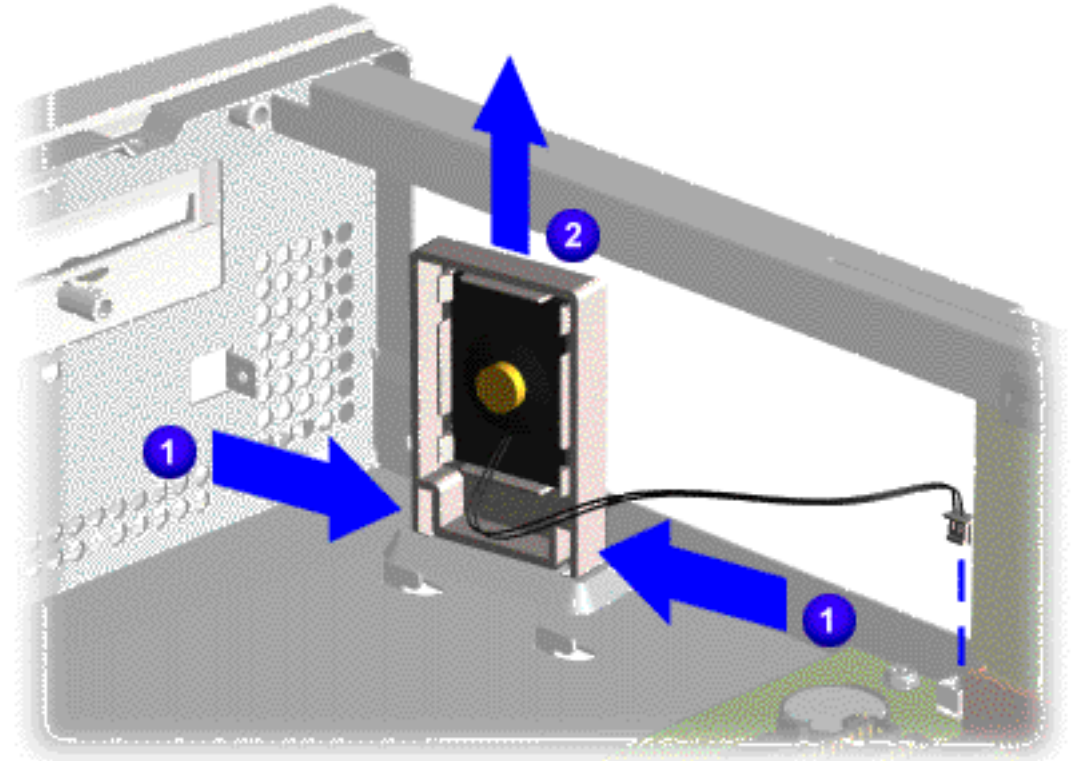
Internal Speakers (ES models), continued

- 4 Squeeze the plastic speaker casing at the bottom **1** (or squeeze the speaker tabs *under* the chassis), then pull the speaker vertically out of the chassis **2**.

END OF SEQUENCE

To replace a speaker, reverse this sequence.

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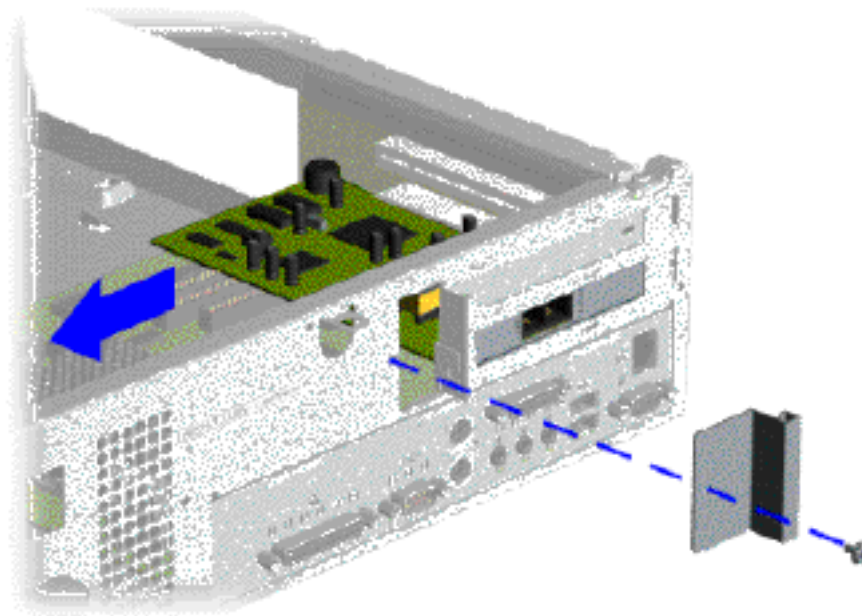
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REMOVAL & REPLACEMENT

Fax/modem



NOTE

Your modem may look different and be in the upper option slot.

- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 Remove the screw holding the option card retainer bracket to the chassis.
- 4 Remove the option card retainer bracket, then carefully pull the fax/modem board out of the riser card.

To replace the fax/modem, reverse this sequence.

IMPORTANT

When replacing the fax/modem, download the latest software from SoftPaq. If QuickRestore is used, it may not have the 56K or V.90 upgrade software included.

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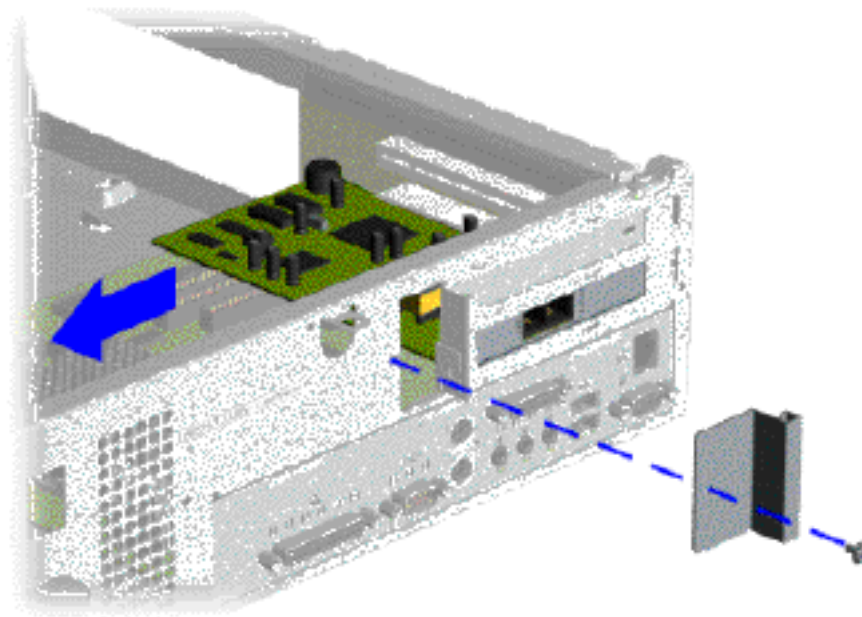
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REMOVAL & REPLACEMENT

NIC card (2416ES models)



NOTE

Your NIC card may look different and be in the upper option slot

- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 Remove the screw holding the option card retainer bracket to the chassis.
- 4 Remove the option card retainer bracket, then carefully pull the NIC card off the riser card.

END OF SEQUENCE

To replace the NIC card, reverse this sequence.

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Mass Storage Devices - Index Page

The mass storage devices are located in a drive cage, which needs to be taken out of the chassis before removing a drive.

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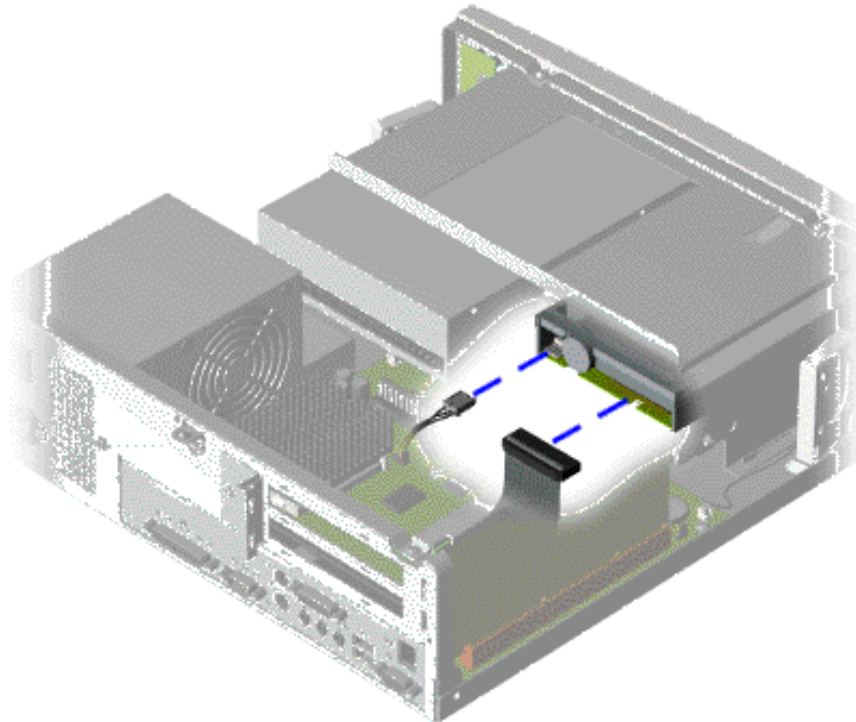
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REMOVAL & REPLACEMENT

Mass Storage Devices

Removing the Drive Cage



There are ***five*** steps in this sequence.

- 1** [Perform preparation procedures.](#)
- 2** [Remove the hood.](#)
- 3** Disconnect the cables from the diskette drive.

[NEXT STEP](#)

or Go back to [Removal and Replacement](#) main page.

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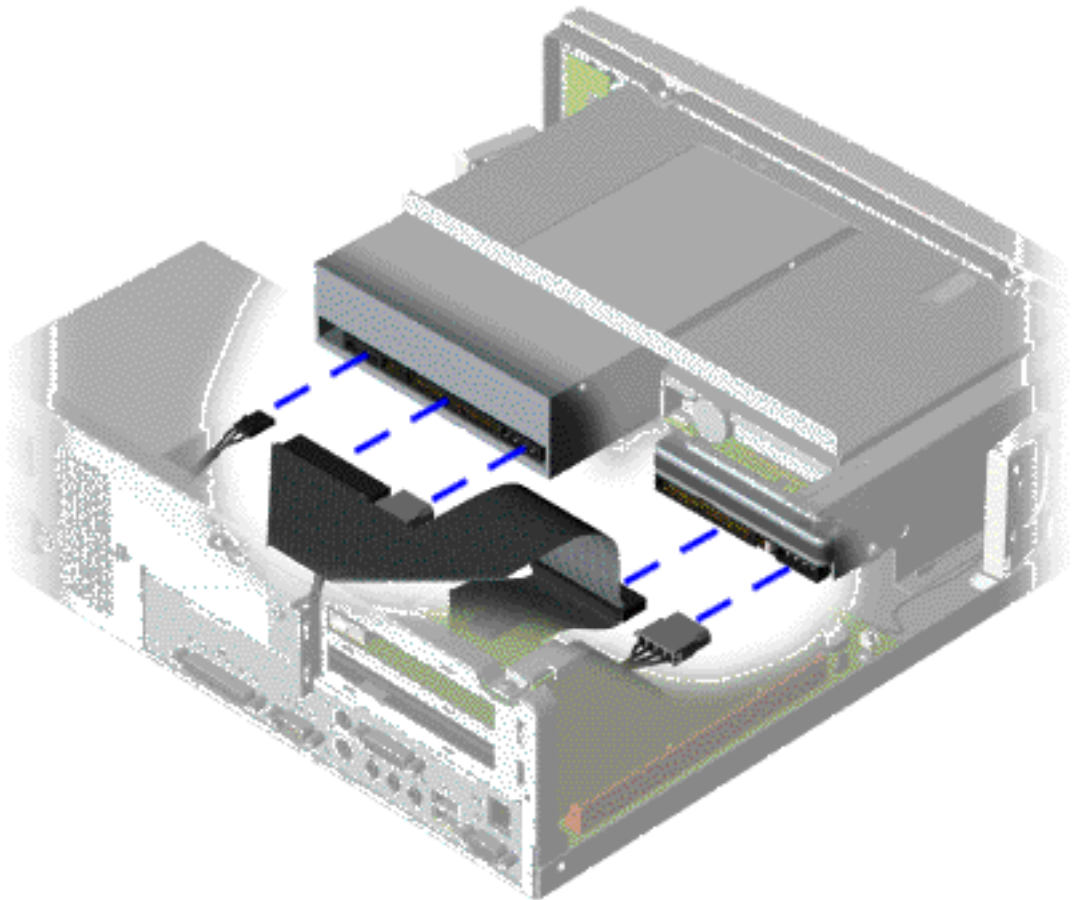
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Removing the Drive Cage (continued)

- 4 Unplug the cables to the CD drive and hard drive

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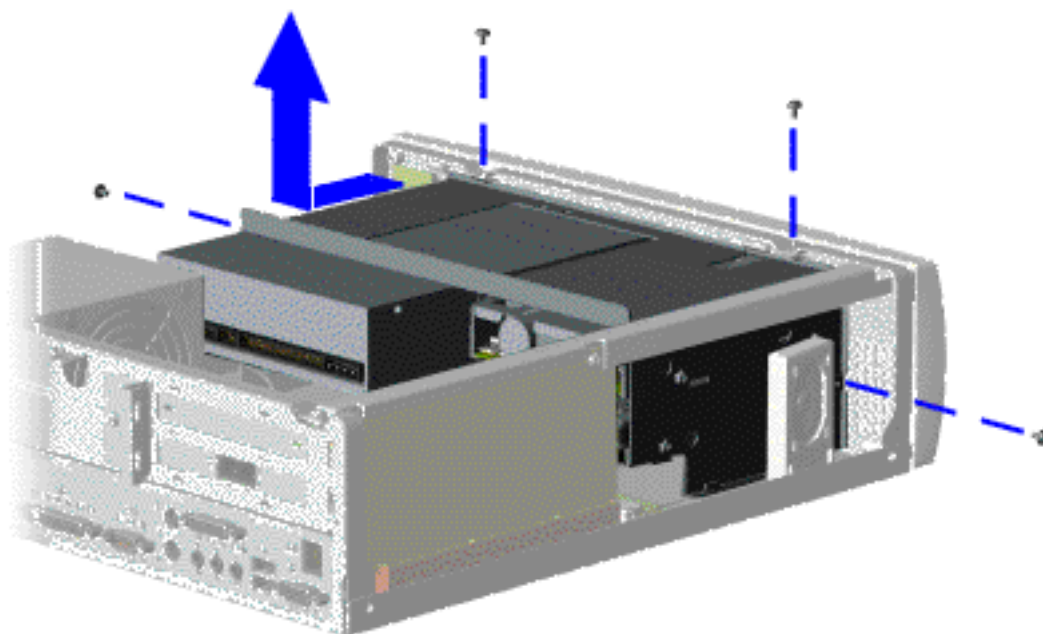
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Mass Storage Devices

Removing the Drive Cage (continued)

- 5 Remove the four screws holding the drive cage to the chassis, then slide the cage toward the rear of the chassis and lift out.



END OF SEQUENCE

To replace the drive cage, reverse this sequence.

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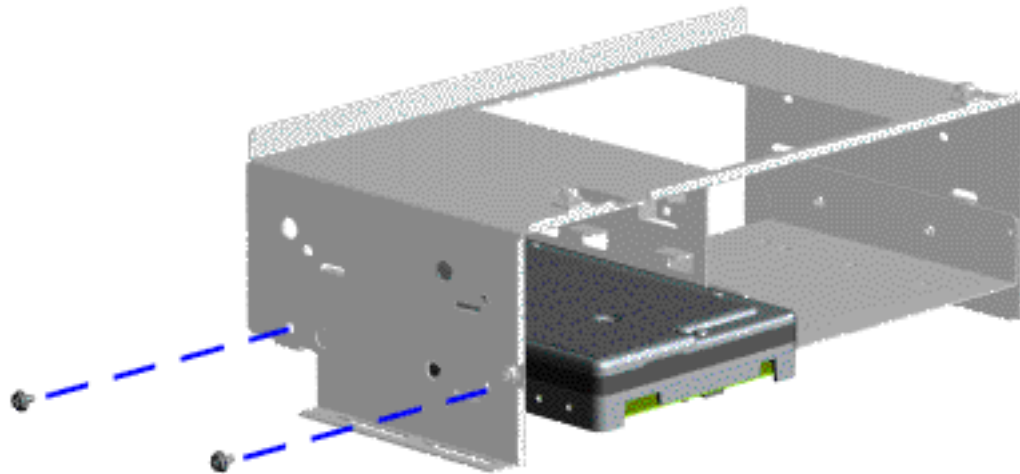
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REMOVAL & REPLACEMENT

Mass Storage Devices

Hard Drive



There are **seven** steps in this sequence.

- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 [Remove the drive cage from the chassis.](#)
- 4 [Remove the CD drive.](#)
- 5 Remove the two screws holding the hard drive to the left side of the cage.

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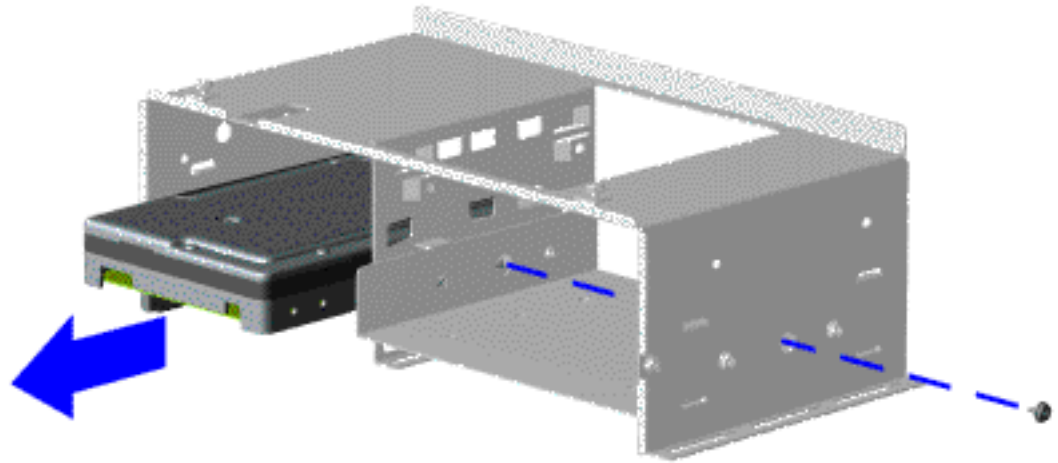
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REMOVAL & REPLACEMENT

Mass Storage Devices

Hard Drive, continued

- 6** Remove the recessed third screw, using an 8" magnetic Philips screwdriver.
- 7** Slide the drive out of the cage.



END OF SEQUENCE

To replace the hard drive, reverse this sequence.

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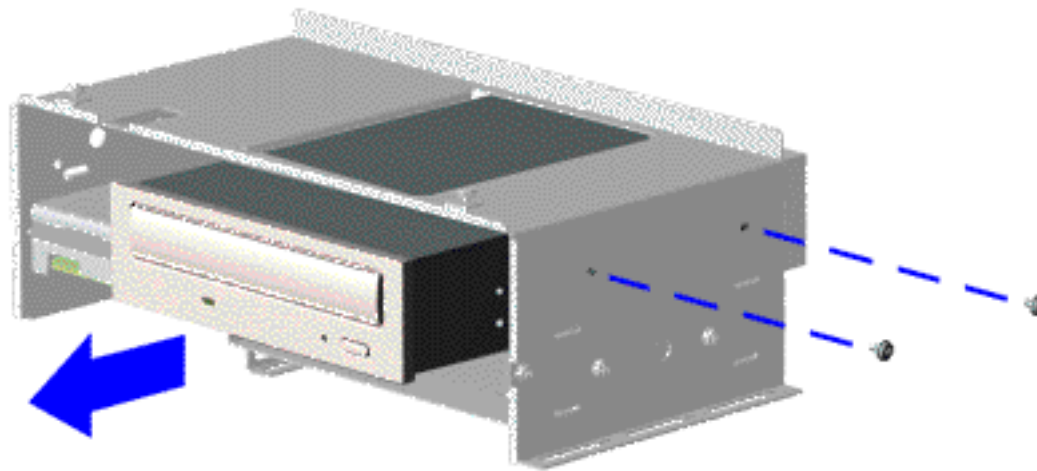
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REMOVAL & REPLACEMENT

Mass Storage Devices

CD Drive



NOTE

Click [here](#) to see how to remove a CD that has jammed in the drive.

- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 [Remove the drive cage from the chassis.](#)
- 4 Remove the two screws holding the CD drive in place, then slide the drive out from the front.

END OF SEQUENCE

To replace the CD drive, reverse this sequence.

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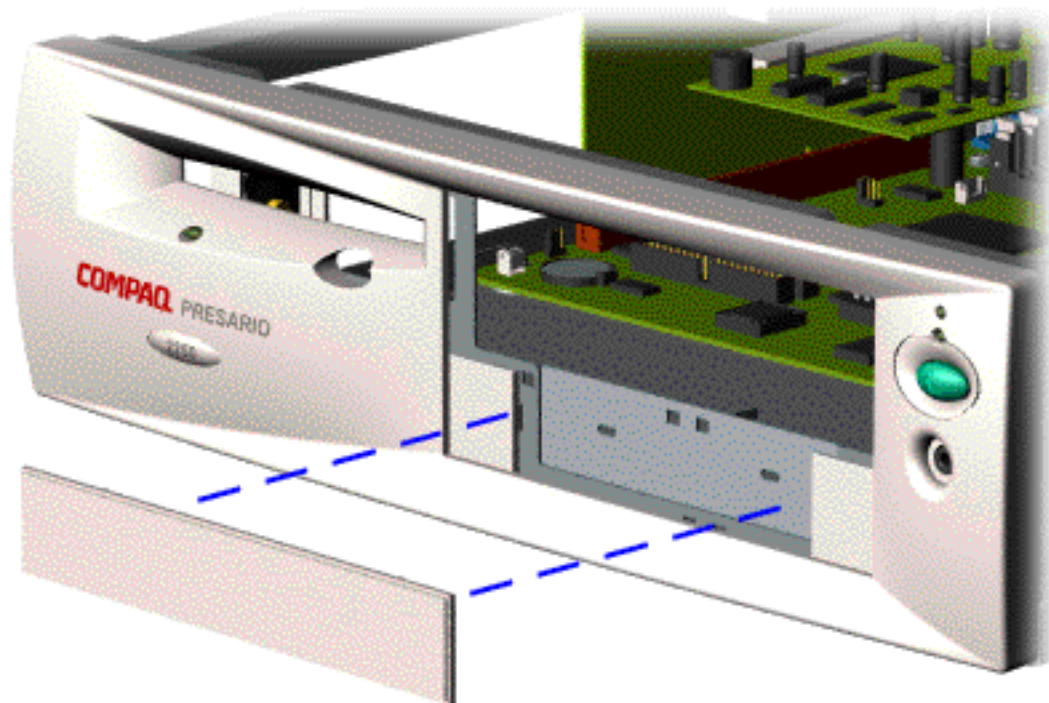
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REMOVAL & REPLACEMENT

Mass Storage Devices

Expansion Bay Cover

The expansion bay is used to hold extra drives, such as a Zip drive or an additional hard drive.



There are **five** steps in this sequence.

- 1** [Perform preparation procedures.](#)
- 2** [Remove the hood.](#)
- 3** [Remove the drive cage.](#)
- 4** Pull out the plastic bay cover.

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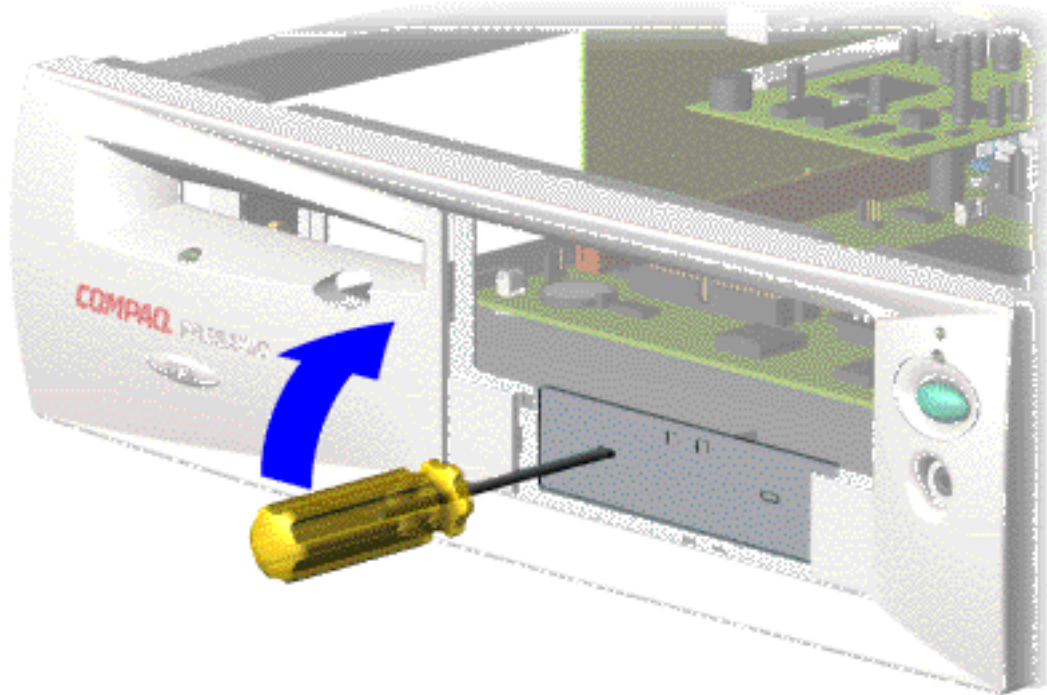
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Mass Storage Devices

Expansion Bay Cover

- 5 Pry out the metal bay cover with a standard screwdriver and discard it.

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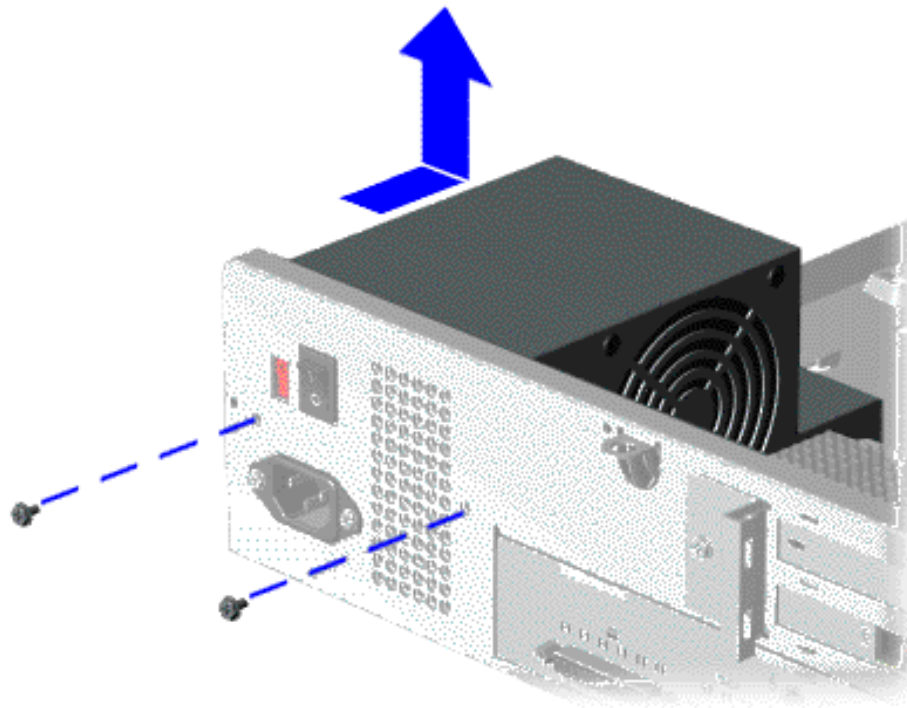
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REMOVAL & REPLACEMENT

Power Supply



- 1 [Perform preparation procedures.](#)
 - 2 [Remove the hood.](#)
 - 3 Unplug all cables attached to the power supply.
 - 4 Remove the two screws that secure the power supply to the rear of the chassis.
- | | |
|-------------|--|
| NOTE | Your power supply may look different from the one shown. |
|-------------|--|
- 5 Slide the power supply back and remove from the chassis.

END OF SEQUENCE

To replace the power supply, reverse this sequence.

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components**

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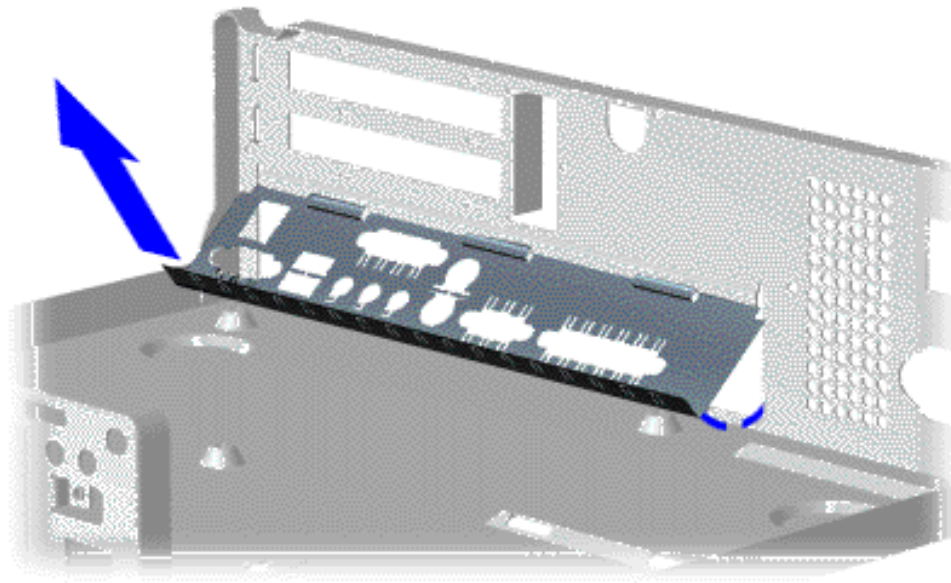
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REMOVAL & REPLACEMENT

System Board Components

I/O Panel



- 1** [Perform preparation procedures.](#)
- 2** [Remove the hood.](#)
- 3** [Remove the fax-modem.](#)
- 4** [Remove the NIC](#) (if present).
- 5** [Remove the riser card.](#)
- 6** [Remove the system board.](#)
- 7** Remove the eight screws holding the I/O panel to the chassis.
- 8** Gently push the I/O panel into the chassis and lift out.

To replace the I/O panel, reverse this sequence.

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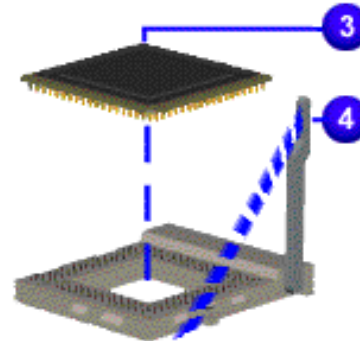
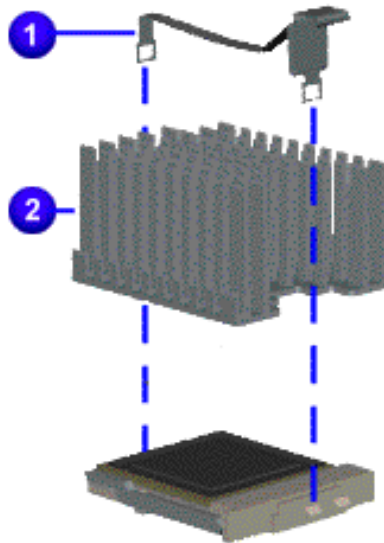
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REMOVAL & REPLACEMENT

System Board Components

Processor and heatsink



- 1 [Perform preparation procedures.](#)
 - 2 [Remove the hood.](#)
 - 3 Remove the clip 1 from the heat sink 2.
 - 4 Lift the heat sink 2 from the processor.
- | | |
|-------------|---|
| NOTE | The processor may come out directly with the heat sink. |
|-------------|---|
- 5 Raise the ZIF socket lever 4 and lift the processor 3 out of the socket.

To reinstall the processor, rub a thermal transfer crayon on the bottom of the heatsink, then reverse the steps above. (The thermal transfer crayon replaces the thermal pad used with earlier processors.)

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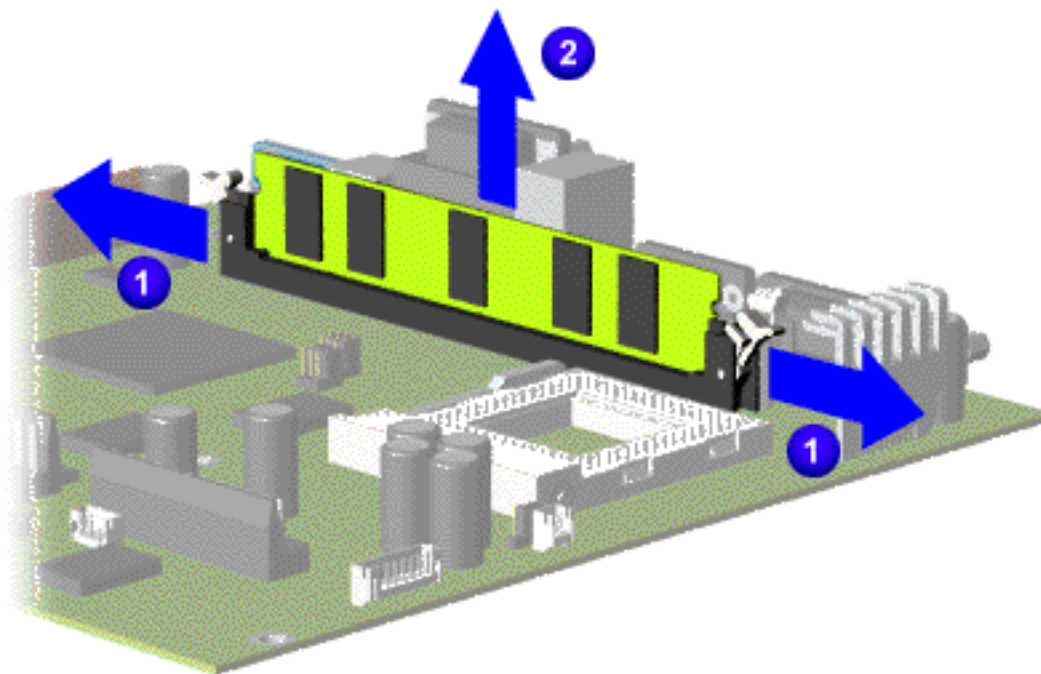
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REMOVAL & REPLACEMENT

System Board Components

Memory Module (DIMM)



- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 [Remove the modem or NIC card](#)
- 4 Release the end latches of the socket **1** and unplug the DIMM from the system board **2**.

To replace the DIMM, reverse this sequence.

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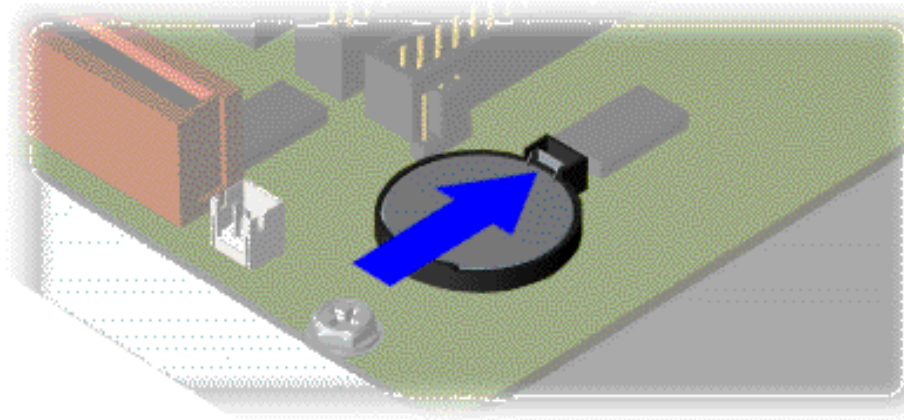
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REMOVAL & REPLACEMENT

System Board Components

Battery



- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 Push out the battery socket latch and lift the RTC battery out of the socket.

To replace the RTC battery, reverse this sequence.



WARNING: The clock/CMOS lithium battery may explode if mistreated. Do not abuse. Use only replacement batteries supplied by Compaq Computer Corporation.

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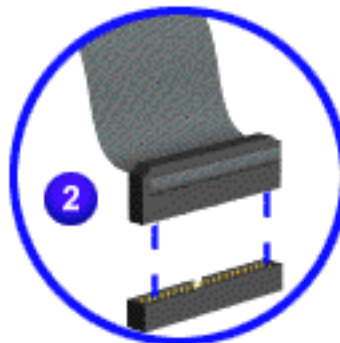
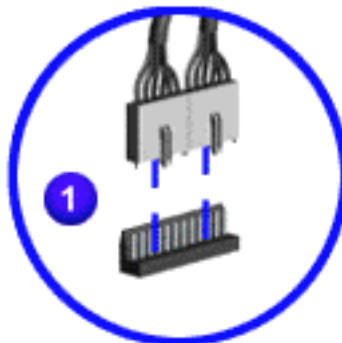
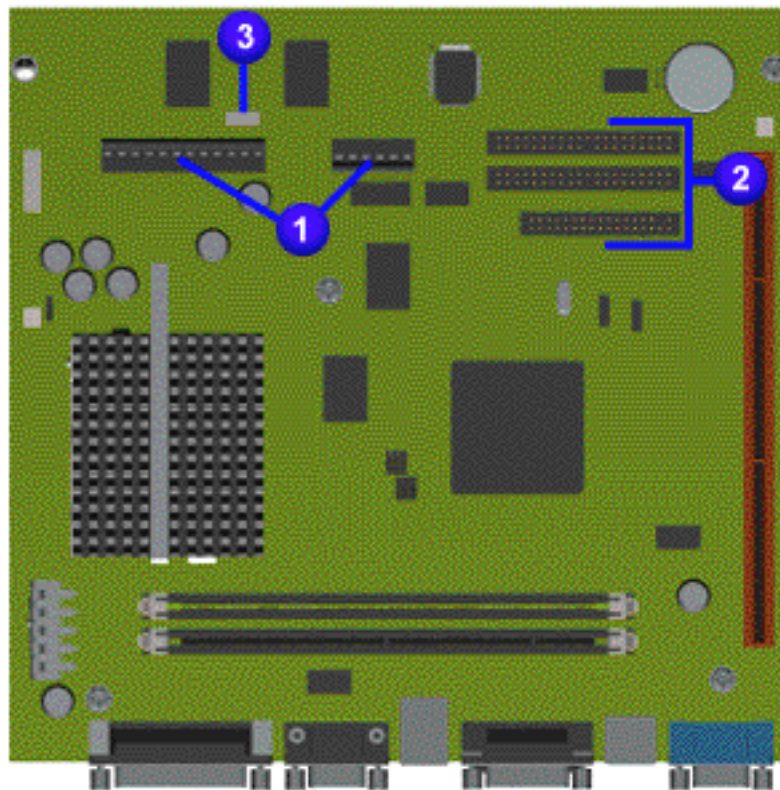
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REMOVAL & REPLACEMENT

System Board Components

System Board



There are **ten** steps in this sequence.

- 1 [Perform preparation procedures.](#)
- 2 [Remove the hood.](#)
- 3 [Remove the fax-modem.](#)
- 4 [Remove the NIC card](#) (if present).
- 5 [Remove the riser card.](#)
- 6 [Remove the drive cage.](#)
- 7 Disconnect the [button board cable](#) from J27.
- 8 If there are internal speakers, [disconnect the speaker cables](#) from J25 and J26.
- 9 Disconnect the power, CD & hard drive, and CD audio cables.

NEXT STEP

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REMOVAL & REPLACEMENT

System Board Components

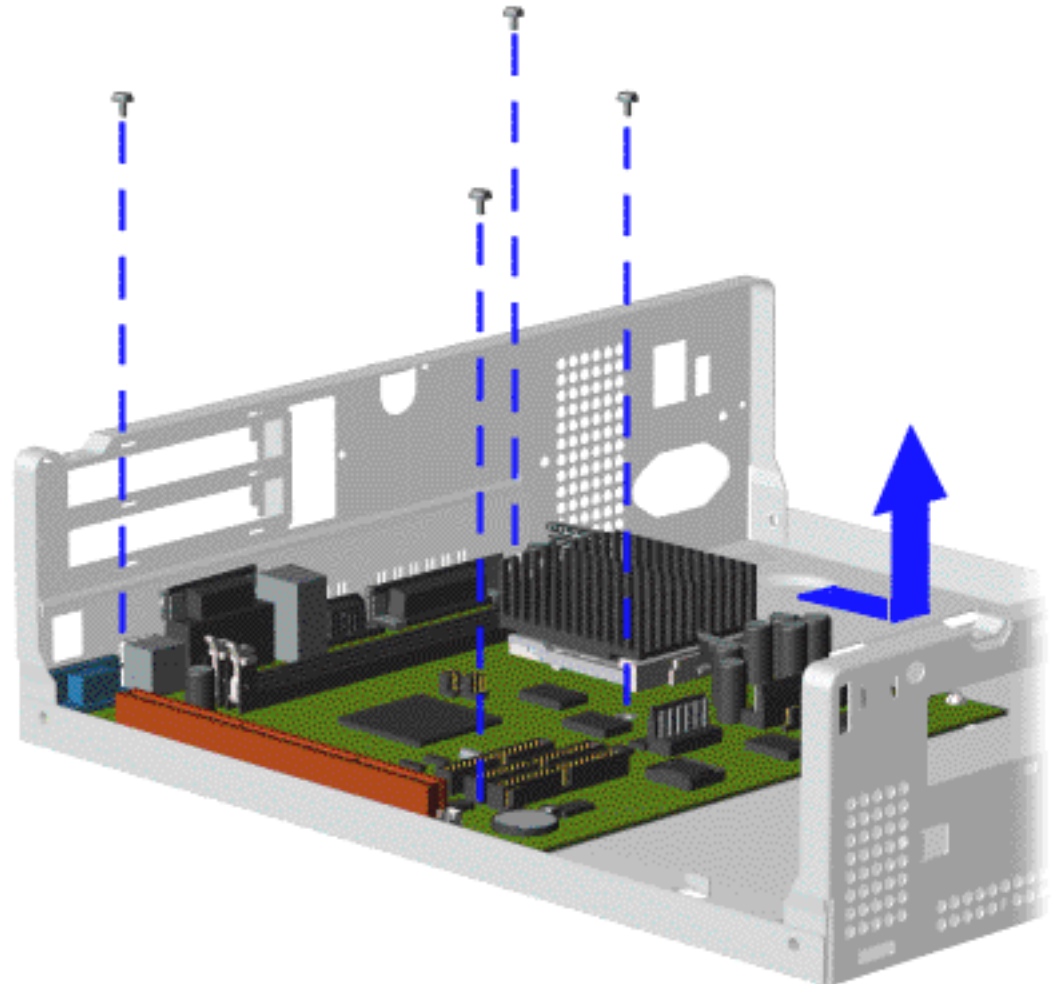
System Board (continued)

- 10 Remove the four screws holding the system board to the chassis, then slide the board away from the I/O panel and lift it off the chassis.

END OF SEQUENCE

To replace the system board, reverse this sequence.

NOTE	The system board spare part kit does not include the processor or DIMM. These components must be transferred from the old system board to the new system board.
-------------	---



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The computer [serial number](#) should be provided to Compaq whenever requesting information or ordering spare parts.

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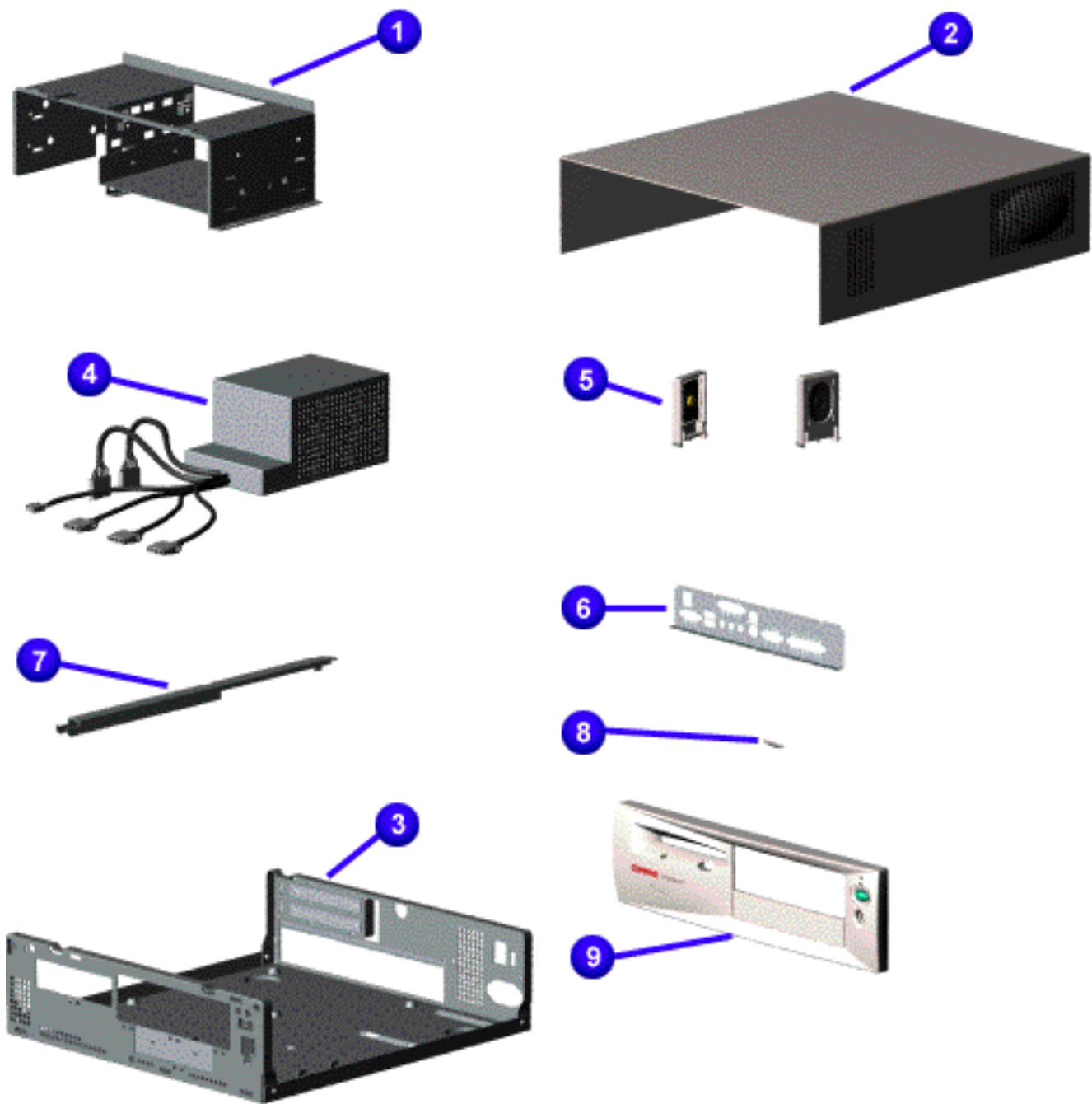
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System Unit

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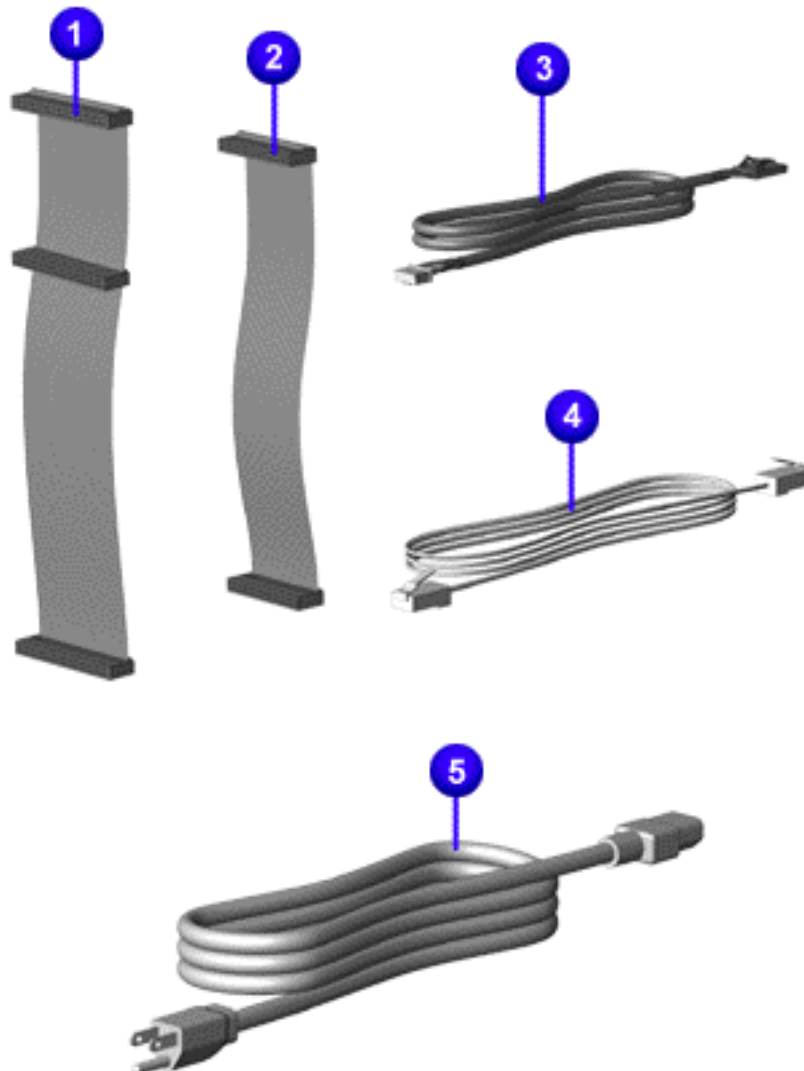
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Cables

To see the description and spare part number for an item, place your cursor over the item and leave it there briefly.



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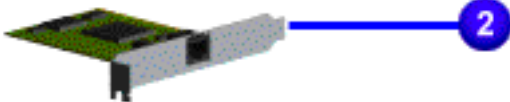

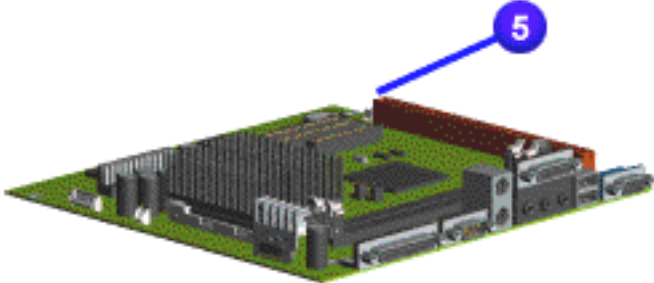
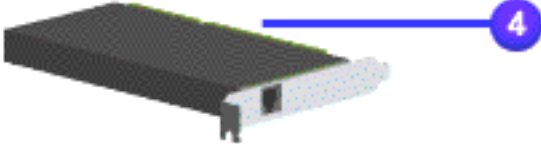

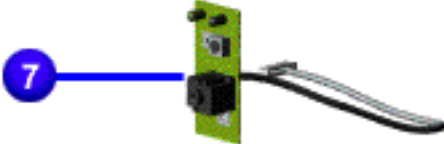
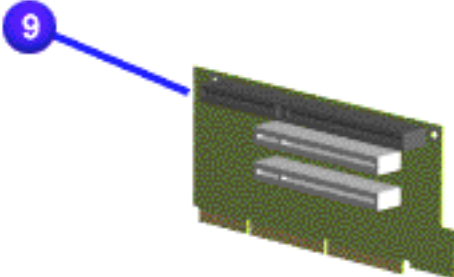
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Processors & Boards

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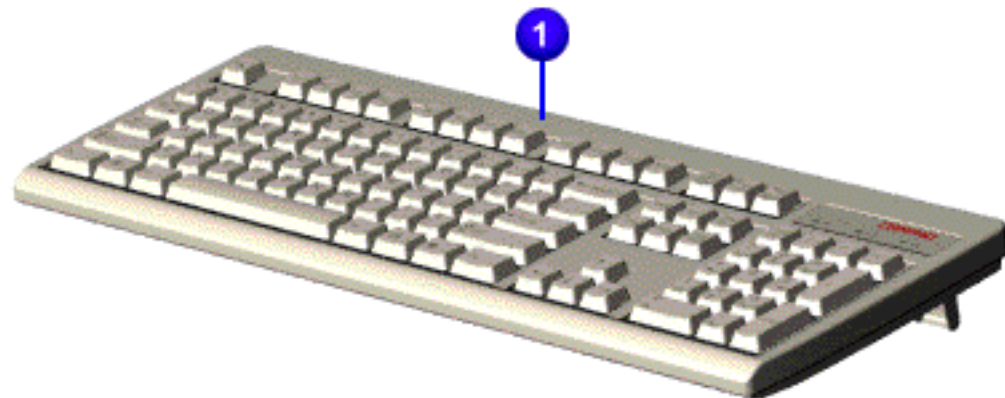
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Keyboards

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Monitors



Description	Spare Part Number
Compaq Presario MV monitors	
MV400	
North America	326902-001
Northern Hemisphere	326902-022
Southern Hemisphere	326902-B34
MV500	
Northern Hemisphere	340707-001
TCO95	340707-026
Southern Hemisphere	340707-B34
MV700	
Northern Hemisphere	340708-001
EMEA	340708-026
Southern Hemisphere	340708-B34
Attachable speakers (not shown)	320426-001
Monitor audio cable (not shown)	268244-001

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Miscellaneous Parts

Description	Spare Part Number
Mouse	337416-001
Mouse with Scroll	334689-001
Internal speakers for educational units	337377-001
SPS Battery	234556-001
RTC battery	337356-001
Heatsink, clip, and thermal crayon	337369-001
Miscellaneous hardware/plastics kit	337368-001

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Return Kits

Description	Spare Part Number
Return kit for 2200, 2400 Series computers	337376-001
Carton and buns (international) for above models	337376-002
Return kit with packing, Compaq Presario MV400 monitor	341082-001
Return kit with packing, Compaq Presario MV500 monitor	341083-001
Return kit with packing, Compaq Presario MV700 monitor	341084-001

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Description	Spare Part Number
Manual Kit	319172-002
QuickRestore Kit (click on the box for a list)	
Quick Reference Guide (1 each)	162212-001
Quick Reference Guide (5 pack)	106854-001
Quick Reference Guide (1 each, quarterly subscription)	184960-001
Quick Reference Guide (5 pack, quarterly subscription)	184961-001
QuickFind for North America, Latin America, Asia/Pacific	137906-xxx**
QuickFind for Europe, Middle East, Africa	137907-xxx**

** QuickFind is updated monthly. To complete the QuickFind part number, add the suffix from the table below for the desired month. If you do not specify the 3-digit suffix, the default is the month in which the order is placed.

Suffix	Month	Suffix	Month	Suffix	Month	Suffix	Month
-001	January	-004	April	-007	July	-010	October
-002	February	-005	May	-008	August	-011	November
-003	March	-006	June	-009	September	-012	December

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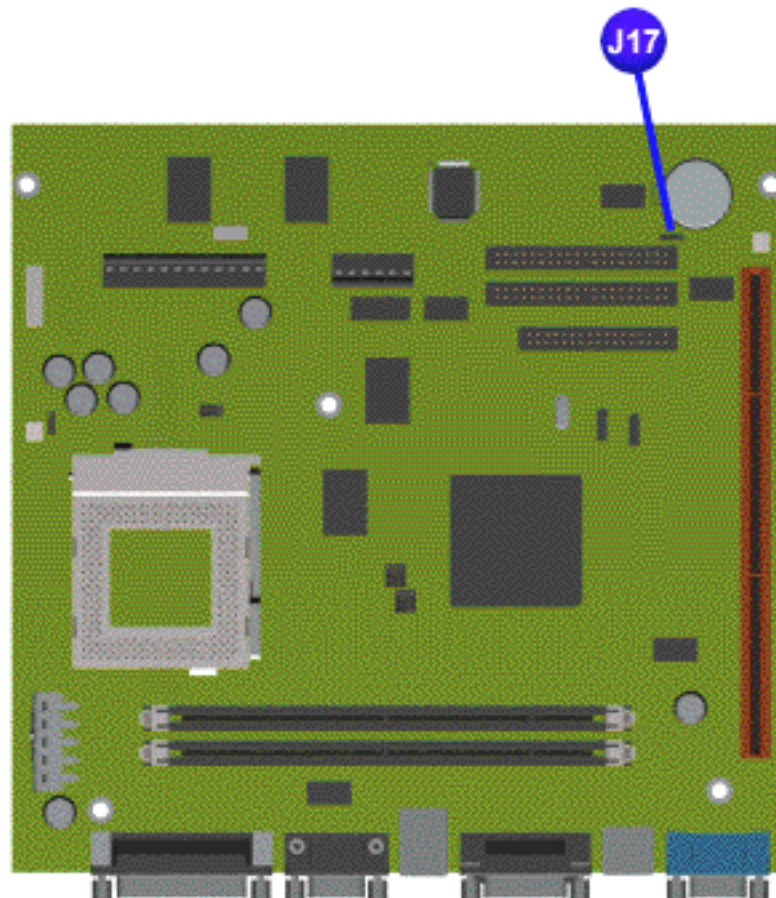
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TROUBLESHOOTING

Clearing CMOS

If the power-on password is unknown, clearing CMOS will disable the password and allow the computer to be operated.



- 1 Complete the [preparation for disassembly procedures](#).
- 2 [Remove the hood](#).
- 3 To clear CMOS and disable the password, move the jumper at J17 from pins 1-2 to pins 2-3 for 10 seconds, then return to pins 1-2.

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TROUBLESHOOTING

Power-On Self Test (POST)

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

- Keyboard
- System board
- Memory modules
- Video memory
- Diskette drives
- Hard drive
- Power supply

POST also detects the type of mass storage devices installed in the computer.

If **POST** finds an error in the system, an error condition is indicated by an audible and/or visual message. The table below gives explanations of the error codes and a recommended course of action.

NOTE	If your model doesn't have internal speakers, an external speaker must be plugged into the speaker output connector to hear any beeps during POST .
-------------	--

Click a link below to find the probable cause and recommended action for a given error message.

IMPORTANT	Retest the system after completing each step. If the problem has been resolved, do not proceed with the remaining steps.
------------------	---

Diskette Drive A or B Error	Keyboard Controller Error	System BIOS Shadowed
Extended RAM failed at offset <i>nnn</i>	Keyboard Error	System Cache Error
Failing Bits <i>nnn</i>	Operating System Not Found	System CMOS Checksum Bad
Fixed Disk 0 or 1 Failure	Parity Check 1	System RAM Failed at Offset, <i>nnn</i>
Fixed Disk Controller Failure	Parity Check 2	System Timer Error
Incorrect Drive A Type	Real Time Clock Error	UMB Upper Limit Segment Address <i>nnn</i>
Invalid NVRAM Media Type	System Battery is Dead	Video BIOS Shadowed

POST Messages

Error message	Probable Cause	Recommended Action
Diskette Drive A or B Error	Drive A: or B: is present, but fails the BIOS POST diskette tests	1. Run Setup . 2. Replace the signal cables. 3. Replace the drive.
Extended RAM failed at offset <i>nnn</i>	Extended memory not working or not configured properly	1. Replace the memory modules . 2. Replace the system board .
Failing Bits <i>nnn</i>	<i>nnn</i> is a map of the bits at the RAM address which failed the memory test	1. Run Setup . 2. Replace the system board .
Fixed Disk 0 or 1 Failure	Hard drive is not working or not configured properly	1. Run Setup . 2. Replace the signal cable. 3. Replace the hard drive .
Fixed Disk Controller Failure	Hard drive is not working or not configured properly	1. Run Setup . 2. Replace the system board .
Incorrect Drive A Type	Type of diskette in drive A: not correctly identified	1. Run Setup . 2. Replace the diskette drive .
Invalid NVRAM Media Type	Problem with NVRAM (CMOS) access	Replace the system board .
Keyboard Controller Error	Keyboard, I/O keyboard controller (on system board), or mouse error	1. Replace the keyboard. 2. Replace the mouse. 3. Replace the system board .
Keyboard Error	Keyboard, I/O keyboard controller (on system board), or mouse error	1. Replace the keyboard. 2. Replace the mouse. 3. Replace the system board .
Operating System Not Found	Operating system cannot be located on either drive A: or C:	Run Setup .
Parity Check 1	Parity error found in the system bus	1. Run Setup . 2. Replace the memory modules . 3. Replace the system board .
Parity Check 2	Parity error found in the I/O bus	1. Run Setup . 2. Replace the ISA board (modem) .
Real Time Clock Error	Real-time clock fails BIOS test	Replace the system board .
System Battery is Dead	RTC battery is dead	1. Replace the RTC battery . 2. Run Setup .
System BIOS Shadowed	System BIOS copied to Shadow RAM	Status message. No action required.
System Cache Error	RAM cache failed the BIOS test	Run Setup .
System CMOS Checksum Bad	CMOS is corrupted or modified incorrectly	Run Setup .
System RAM Failed at Offset, <i>nnn</i>	System RAM failed	Replace memory modules .
System Timer Error	DMA, timers, etc.	Replace the system board .
UMB Upper Limit Segment Address <i>nnn</i>	Displays the address <i>nnn</i> of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS	Status message. No action required.
Video BIOS Shadowed	Video BIOS successfully copied to shadow RAM	Status message. No action required.

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TROUBLESHOOTING

Setup and Compaq Utilities

This section explains how to use Setup and Compaq Utilities which should be accessed in the following instances:

- When a system configuration error is detected during the Power-On Self-Test (POST)
- To change factory default settings for some of the computer features
- To change the system configuration, which is sometimes necessary when you add or remove optional hardware
- To set system configuration features

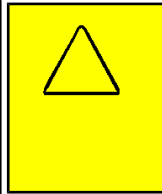
Click a link below to go to the appropriate subsection:

- [Preparing the Computer](#)
- [Setup](#)
- [Compaq Utilities Options](#)
- [Computer Checkup \(TEST\)](#)
- [View System Information \(INSPECT\)](#)

Preparing the Computer

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

- 1 Ensure proper ventilation. The computer should have a 3-inch (7.6 cm) clearance at the back of the system unit.
- 2 Turn off the computer and peripheral devices.



CAUTION: Always ensure that the power is off before disconnecting or reconnecting the mouse, keyboard, or any other peripheral devices. Disconnecting or connecting the keyboard or mouse while the unit power is on can damage the system board.

- 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 Install loop-back and terminating plugs for complete testing.

[Go back to the top.](#)

Setup

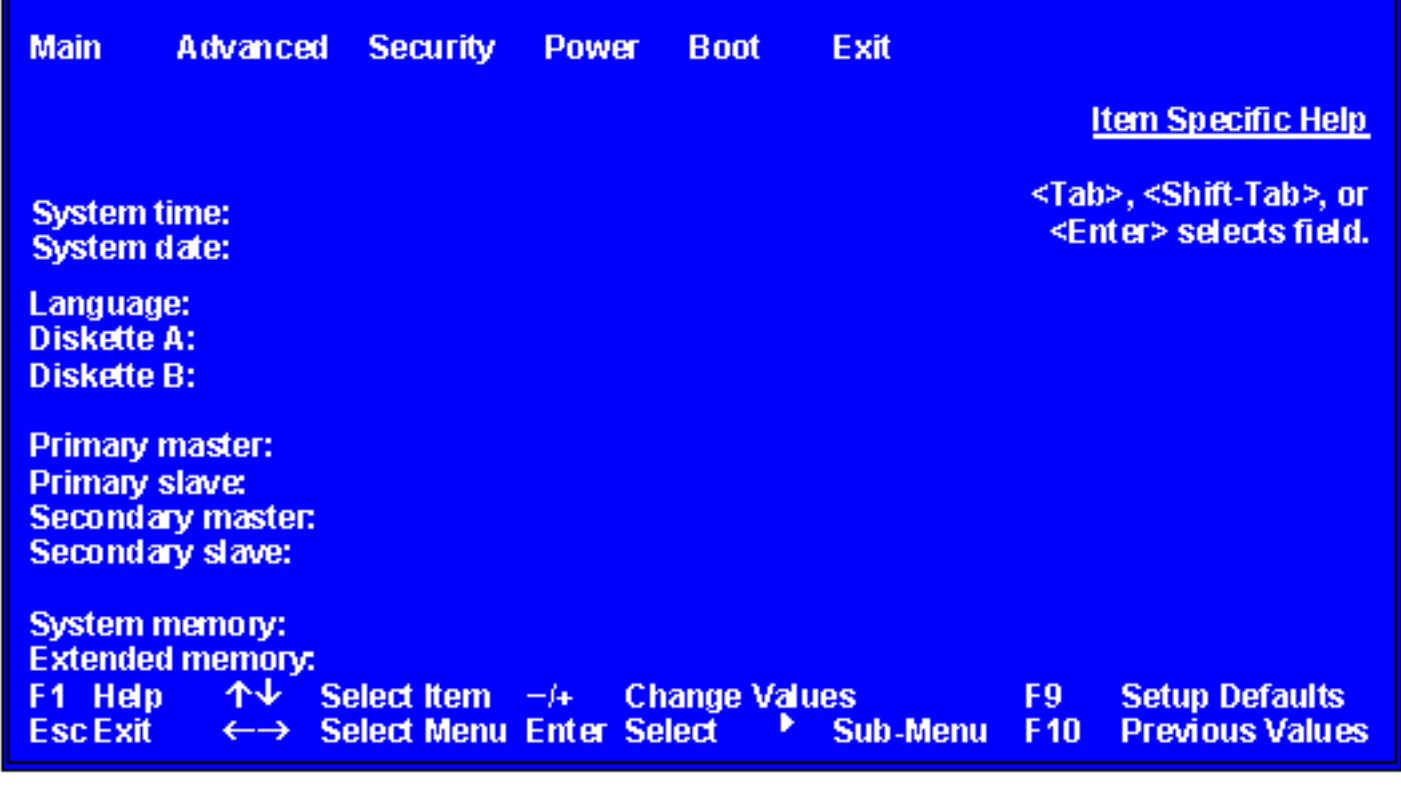
The *Setup* utility gives a snapshot of the computer's hardware configuration, aids in troubleshooting, and sets custom features. *Setup* recognizes a new internal component or an external device and automatically updates the configuration screens. Use the *Setup* utility to:

- Modify settings for audio, storage, power management, communications, and input devices
- Get an overall picture of the computer's hardware configuration
- Verify configuration parameters in determining problems
- Set time and date

Running Setup

To access the *Setup* utility, turn on the computer and press the **F10** key when the block cursor appears in the upper-right corner of the screen. The following menu will appear:

NOTE	The actual menu displayed on your computer may vary slightly, depending on your configuration.
-------------	--



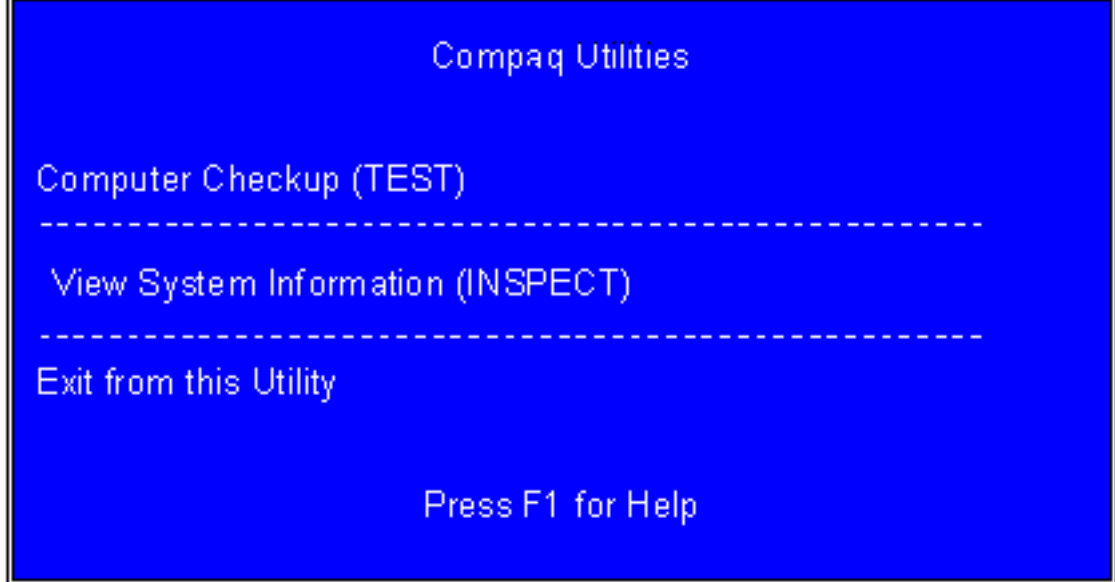
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Compaq Utilities Options - TEST and INSPECT

The Compaq Utilities diagnostics must be run from a diskette, created as follows:

- 1 Insert the *QuickRestore CD* into the CD drive.
- 2 From the Windows desktop, click on **Start**, then **Program**, then **Windows Explorer**.
- 3 Click on the CD drive icon.
- 4 Double-click on the **PCdiags** folder.
- 5 Insert a diskette in the diskette drive.
- 6 Double-click on the **QRST5.exe** icon.
- 7 Press **Enter** when the QuickRestore label appears.
- 8 After the CD has completed copying to the diskette, eject the *QuickRestore CD*.

To run Compaq Utilities, put the Compaq Utilities diskette in the diskette drive and turn on or reboot the computer. The following menu will appear:



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Computer Checkup (TEST)

Computer Checkup (TEST) is a utility that determines if the various computer components installed in the system are recognized by the system and functioning properly. Running TEST after connecting a new device is optional, but advisable.

TEST helps analyze the system. This information allows the technician to reproduce the configuration of your computer on another computer for testing.

To run TEST, complete these six steps:

- 1 From the **Compaq Utilities** menu, select the **Computer Checkup (TEST)** option.

A **Test Option** menu is displayed.

- 2 Select the option to view the device list.

A list of the installed hardware devices is displayed.

- 3 Verify that the TEST utility correctly detected the devices installed.

NOTE	This utility may not detect all non-Compaq devices.
-------------	---

- If the list is correct, select **OK**.

The **Test Option** menu is displayed again.

- If the list is incorrect, be sure that any new devices are installed properly.

- 4 Select one of the following from the **Test Option** menu:

- **Quick Check Diagnostics** runs a quick, general test on each device with a minimal number of prompts. If errors occur, they are displayed when the testing is complete.
- **Automatic Diagnostics** runs unattended, maximum testing of each device with minimal prompts. You can choose how many times to run the tests, to stop on errors, or to print or file a log of errors.
- **Prompted Diagnostics** allows maximum control over the device testing process. You can choose attended or unattended testing, decide to stop on errors, or choose to print or file a log of errors.

IMPORTANT	Choosing attended testing allows data-destructive tests.
------------------	--

NOTE	When you run the TEST utility, be sure to record the error message numbers. These are used to help identify the likely problem .
-------------	--

- 5 Follow the instructions on the screen as the diagnostic tests are run on the devices. When testing is complete, the **Test Option** menu is displayed again.

- 6 Exit to the **Compaq Utilities** menu.

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View System Information (INSPECT)

The View System Information (INSPECT) utility provides information about the system once it has been configured. INSPECT operates with MS-DOS and provides information about the system operating environment including:

- Contents of the operating system startup files
- Current memory configuration
- ROM version
- Type of processor and coprocessor
- Diskette and hard drives
- Active printer and communications interfaces
- Modem

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Diagnostic Error Codes

Diagnostic error codes occur if the system recognizes a problem while running the Compaq Utilities program. These error codes help identify possibly defective subassemblies.

Tables listed on this page give possible error codes, descriptions of each error condition, and actions required to resolve the error condition.

IMPORTANT:	Retest the system after completing each step. If the problem has been resolved, do not proceed with the remaining steps.
-------------------	--

For assistance in the removal and replacement of a particular subassembly, see [Removal and Replacement Procedures](#).

100-xx	Processor	800-xx	Monochrome video	3200-xx	Audio
200-xx	Memory	1100-xx	Serial	3300-xx	CD or DVD
300-xx	Keyboard	1200-xx	Modem	6600-xx	CD or DVD
400-xx	Parallel (printer)	1700-xx	Hard drive	8600-xx	Pointing device interface
500-xx	Monitor	1900-xx	Tape drive		
600-xx	Diskette drive	2400-xx	Video		

Keyboard 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 the computer off and connect the keyboard. 2 Replace the keyboard and retest. 3 Replace the system board and retest.
302-xx	Keyboard long test failed	
303-xx	Keyboard LED test, 8042 self-test failed	
304-xx	Keyboard typematic test failed	

Parallel (printer) 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. 2 Check power to the printer. 3 Install the loop-back connector and retest. 4 Replace the system board and retest.
402-xx	Printer data register failed	
403-xx	Printer pattern test failed	
498-xx	Printer failed or not connected	

Monochrome video error codes

Error Code	Description	Recommended Action
802-xx	Video memory test failed	The following step applies to error codes 802-xx through 824-xx: Replace the system board and retest.
824-xx	Monochrome video text mode test failed	

Serial error codes

Error Code	Description	Recommended Action
1101-xx	Serial Port Test	The following steps apply to error codes 1101-xx through 1109-xx: 1 Check the switch settings on the serial/parallel device, if applicable. 2 Replace the system board and retest.
1109-xx	Clock Register Test	

Modem error codes

Error Code	Description	Recommended Action
1201-xx	Modem Internal Loop-Back Test	The following steps apply to error codes 1201-xx through 1210-xx: 1 Refer to modem documentation for correct setup procedures. 2 Check the modem line. 3 Replace the modem and retest.
1202-xx	Modem Time-Out Error	
1203-xx	Modem External Termination Test	
1204-xx	Modem Auto Originate Test	
1206-xx	Dial Multifrequency Tone Test	
1210-xx	Modem Direct Connect Test	

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Troubleshooting Without Diagnostics

This section describes some simple, preliminary tests and guidelines for troubleshooting the computer.

Checklist For Solving Minor Problems

If you encounter some minor problem with the computer or software application, go through this checklist for possible solutions before running any of the diagnostic utilities:

- Is the computer connected to a working power outlet?
- Is the computer turned on and the power light illuminated?
- Are all cables connected properly and seated?
- Are all of the necessary device drivers installed?
- Is the *CONFIG.SYS* file correct?
- Is the *AUTOEXEC.BAT* file (MS-DOS) or *STARTUP.CMD* file correct?
- Was a nonbootable diskette loaded in the diskette drive at power-up?
- Are all switch settings correct?
- Was Computer Setup run after installing options (memory, disk drives, etc.) and before installing industry standard architecture boards?

Click on a link below for quick checks and possible solutions for problems related to these topics:

- | | | |
|--------------------------------|---------------------------------------|---------------------------|
| CD drive | hard drive | power |
| diskette drive | hardware conflicts | USB ports |
| DVD drive | hardware installation | monitor |

CD drive		
Problem	Probable cause(s)	Possible solution
Cannot read compact disc	CD is not properly seated in the drive.	Eject the CD, press down on the CD firmly to correctly seat it in the drive, then reload.
	CD has been loaded upside down.	Eject the CD, turn it over, then reload.
	CD may be dirty or scratched.	Clean the CD or load another CD.
Cannot eject compact disc (tray-load only)	CD is not properly seated in the drive.	Turn off the computer, insert a straightened paper clip into the emergency eject hole, then push firmly. Slowly pull the tray out from the drive until the tray is fully extended, then remove the CD.
CD drive devices are not detected	Power cycle delay.	After turning the computer off, wait 30 seconds before turning the computer on again.
	CD drive is not connected properly.	Open the computer and check to see that the drive cable is connected properly.
	Proper driver is not loaded	Restart the system and make sure the CD drive drivers are loaded.

DVD drive		
Problem	Probable cause(s)	Possible solution
Cannot read DVD disk	DVD or CD is not properly seated in the drive.	Eject the DVD or CD, press down on the DVD or CD firmly to correctly seat it in the drive, then reload.
	DVD or CD has been loaded upside down.	Eject the disk, turn it over, then reload.
	DVD or CD disk may be dirty or scratched.	Load another DVD disk.
DVD does not work in the DOS mode	Proper drivers are not loaded.	Restart the system and make sure the DVD drive drivers are loaded.
Cannot eject DVD disk	The system is in the Sleep mode.	Press the Power button to bring the system back to full power, then eject the DVD.
	The DVD, diskette, or hard drive was active when attempting to eject the DVD.	Wait until all drive activity ends (the CD/hard drive light and diskette drive light will go out), then try to eject the DVD.
	DVD disk is not properly seated in the drive.	Turn off the computer, insert a straightened paper clip into the emergency eject hole, then push firmly. Slowly pull the tray out from the drive until the tray is fully extended, then remove the DVD disk.
DVD drive devices are not detected	DVD drive is not connected properly.	Open the computer and check to see that the drive cable is connected properly.
	Incorrect driver is installed.	Ensure the correct driver is installed in <i>CONFIG.SYS</i> .
	Drive has been changed.	Make sure the jumper setting is set for "Slave."
	Proper drivers are not loaded.	Restart the system and make sure the DVD drive drivers are loaded.

Resolving Hardware Conflicts

Hardware conflicts may occur when two or more peripheral devices attempt to use the same hardware resources. Interrupts, I/O addresses, and DMA channels are the most common hardware resources used by peripheral devices. For example, the factory default settings for the MIDI port audio interface are:

Base I/O address	220H
MIDI Port Base I/O address	330H
Interrupt	IRQ 5
8-bit DMA	Channel 1

When different peripheral devices use the same hardware resources at the same time, the devices and/or the system may not function properly. Although PCI devices are required to be capable of sharing IRQs with other PCI devices, conflict may still arise at the software level. In this case, contact the vendor for updated drivers.

You can resolve hardware conflicts by ensuring that no devices are configured to use the same hardware resources. These resources can either be dipswitch or jumper settings on the peripheral card or software configurable resources. The [Computer Setup](#) selection of your Compaq Utilities allows you to view and modify the settings for the peripheral devices which were factory installed in your system. Refer to the *User's Guide* for the particular peripheral cards you wish to install for information on how to view and select their settings.

To resolve hardware conflicts:

- 1 Change the hardware settings of your audio card or other peripheral card in your system if the peripheral card is using any settings used by the factory-installed devices.
- 2 If you are unsure of the settings of the peripheral cards, you can isolate the source of the problem by temporarily removing all cards not manufactured by Compaq, or resetting the default settings and running [Compaq Utilities](#). After that, add the cards back one at a time until the card that is causing the conflict is found.

Also see... [System specifications](#)

TROUBLESHOOTING

Troubleshooting Without Diagnostics (continued)

[Clearing CMOS](#)

[Power-On Self Test \(POST\)](#)

[Configuration](#)

[Diagnostic error codes](#)

Troubleshooting without diagnostics

Hard drive		
Problem	Probable cause(s)	Possible solution
Hard drive error occurs.	Hard disk has bad sectors or has failed.	Run Computer Checkup (TEST) and Computer Setup . Reformat the hard disk.
Drive not found.	Cable could be loose.	Check cable connections.
Disk transaction problem.	Either the directory structure is bad or there is a problem with a file.	From the desktop click on the Start menu. Choose <i>Program ➤ Accessories ➤ System Tools ➤ Scandisk</i> to check for problems. If problems exist, run Scandisk and checkmark the "Automatically fix errors" box at the bottom to correct the problems. If a large number of lost allocation units is found, click on the Start menu. Choose <i>Program ➤ Accessories ➤ System Tools ➤ Disk Defragmenter</i> .
Nonsystem disk message.	The system is trying to start from a diskette that is not bootable.	Remove the diskette from the diskette drive.
	The system is trying to start from the hard drive but the hard disk has been damaged.	Insert a bootable diskette into the diskette drive and restart the computer with Ctrl+Alt+Del .
	Diskette boot has been disabled in Computer Setup.	Run Computer Setup and enable diskette boot.
Hard drive operation seems slow OR Hard drive activity light is not on, or stays on without blinking.	The hard disk files may be fragmented.	From the desktop click on the Start menu. Choose <i>Program ➤ Accessories ➤ System Tools ➤ Scandisk</i> to check for problems. If problems exist, run Scandisk and checkmark the "Automatically fix errors" box at the bottom to correct the problems. If a large number of lost allocation units is found, click on the Start menu. Choose <i>Program ➤ Accessories ➤ System Tools ➤ Disk Defragmenter</i> .

Hardware installation		
Problem	Probable cause(s)	Possible solutions
A new device is not recognized as part of the computer system.	When the system advised you of changes to the configuration, you did not save the changes.	Reboot the computer and follow the instructions for saving the changes.
	The system may not have automatically recognized the new device.	Run Computer Setup and identify the new device.
	The cables for the new external device are loose, or the power cables are unplugged.	Check all cables.
	The power switch for the new external device is not turned on.	Turn off the computer, turn on the external device, and then turn on the computer to integrate the new device with the computer.

Power	
Problem	Possible Solution
Computer will not turn on.	Ensure that the computer is connected to a power source.
Computer does not automatically display the date and time.	The real-time clock (RTC) battery may need to be replaced. Click here for replacement procedures.
Computer does not beep during POST.	The speaker volume may have been turned down. Select the Volume option from the Control Panel and adjust the volume.
Computer powered off automatically.	The unit temperature may have been exceeded. Check the fan for function and blockage.

USB		
Problem	Probable cause(s)	Possible solution
USB device does not work with the system.	The USB device and the system may use different USB architectures.	Ensure that the USB device and the system share the same USB architecture. (UHCI-compliant devices will only work with a UHCI-compliant system, and OHCI-compliant devices will only work with a OHCI-compliant system).

Diskette Drive		
Problem	Probable cause(s)	Possible solution
Diskette drive light stays on.	Diskette may be damaged.	From the desktop click on the Start menu. Choose <i>Program ➤ Accessories ➤ System Tools ➤ Scandisk</i> to check for problems.
	Diskette may be installed incorrectly.	Remove the diskette and reinsert.
	Software program may be damaged.	Check the program diskettes.
Diskette drive cannot write to a diskette.	Diskette is not formatted.	Format the diskette.
	Diskette is write-protected.	Either use another diskette that is not write-protected or disable the write protection on the diskette.
	Writing to the wrong drive.	Check the drive letter in your path statement.
	Not enough space is left on the diskette.	Use another diskette to write the information.
Diskette drive cannot read a diskette.	Diskette is not formatted.	Format the diskette.
	Using the wrong diskette type for the drive type.	Use a diskette that is compatible with the drive.
	Reading the wrong drive.	Check the drive letter in your path statement.
	Diskette drive has been disabled by Computer Setup .	Run Computer Setup and enable the diskette drive.

Monitor		
Problem	Probable cause(s)	Possible solution
Characters are dim.	The brightness control is not set properly.	Adjust the brightness control.
Screen is blank.	A screen-blanking utility could be installed.	Press any key. If the display reappears, you have a screen-blanking utility installed.
	The brightness needs adjusting.	Adjust the brightness control.
	Screen save has been initiated.	Press any key or move the mouse to light the screen.
Garbled characters on the screen are mixed with text.	The ANSI.SYS driver is not in the <i>CONFIG.SYS</i> file.	Add the ANSI.SYS driver to the <i>CONFIG.SYS</i> file by adding the following line: DEVICE = C:\ANSI.SYS
Monitor overheats.	There is not enough ventilation space for proper airflow.	Leave at least 3 inches (7.6 cm) of ventilation space. Also, be sure there is nothing on top of the monitor to obstruct air flow.
Cursor will not move using the arrow keys on the numeric keypad.	The Num Lock key is on.	Press the Num Lock key. The Num Lock light should not be on when you want to use the arrow keys.
	There is a possible application error.	Restart the computer.

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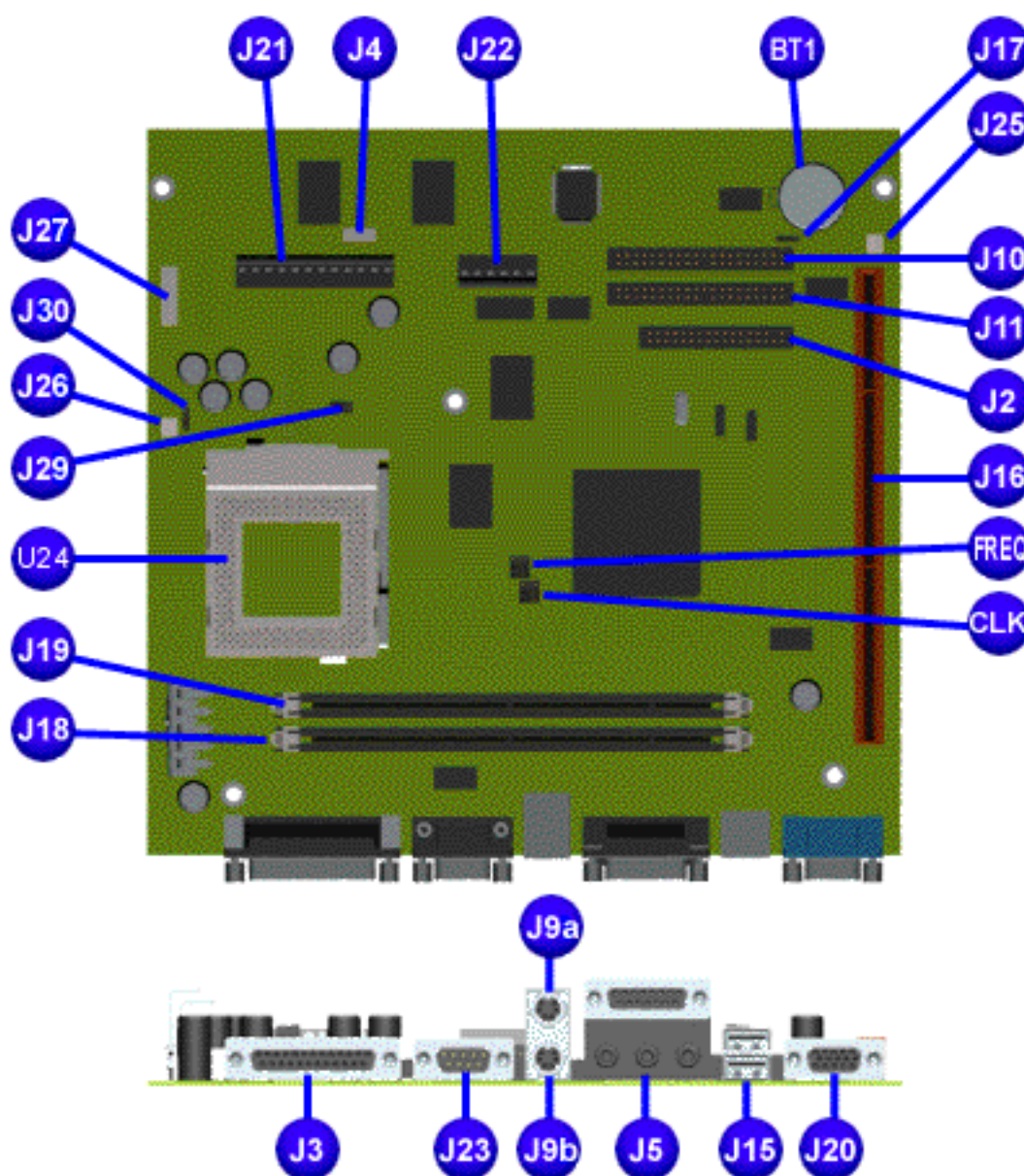
Jumper & Switch Information

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JUMPER & SWITCH INFORMATION

System Board Jumper Location

Click on a jumper designator to see its function and a connector description:



See jumper settings and power supply cable connections.

Connector information

Function	Description	Reference Designator
Keyboard	Miniature 6-pin	J9b
Mouse	Miniature 6-pin	J9a
Parallel port	DSUB 25-pin	J3
Serial	DSUB 15-pin	J23
USB	2 USB connectors	J15
Video	15-pin VGA	J20
Game	DSUB 15-pin	J5D (stacked connectors)
DIMM sockets	168-pin DIMM	J18 (secondary), J19 (primary)
Button & headphone board	9-pin 2mm connector (key 3)	J27
CPU core voltage select	8-pin header	J29
Socket 7	321-pin PGA	U24
Processor DLL voltage	3-pin header	J30
Internal speakers (ES models)	2-pin header	J25 (L), J26 (R)
CMOS clear	3-pin header	J17
Battery socket	Battery holder	BT1
CD-ROM audio	4-pin header, key 2	J4
Socket 7 clock multiplier	3x 3-pin headers	CLK 0 - CLK 2
CPU frequency select	3x 3-pin headers	FREQ 0 - FREQ 2
Riser card slot		J16
IDE drives	40-pin headers, key 20	J10 (CD data & HD / primary) J11 (Zip - if used / secondary)
Diskette drive	34-pin header	J2
Power supply	6-pin & 12-pin ATPWR headers	J22, J21

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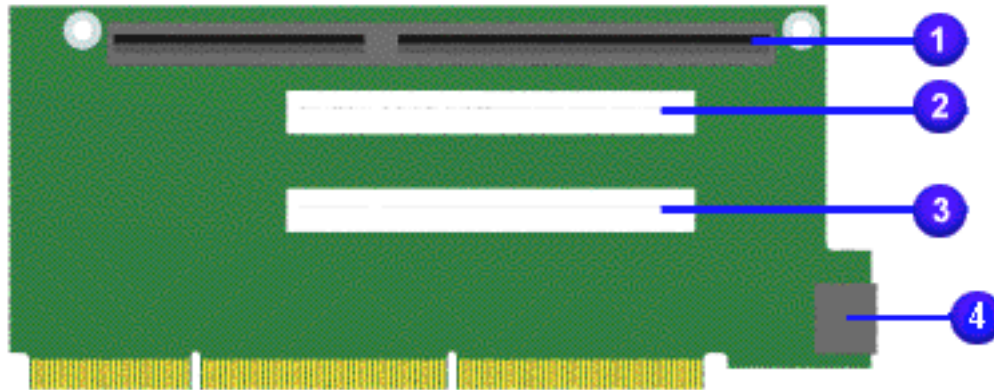
Riser card

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JUMPER & SWITCH INFORMATION

Riser Card



- 1** ISA slot (*select models*)
- 2** PCI slot
- 3** PCI slot
- 4** NIC connector (*select models*)

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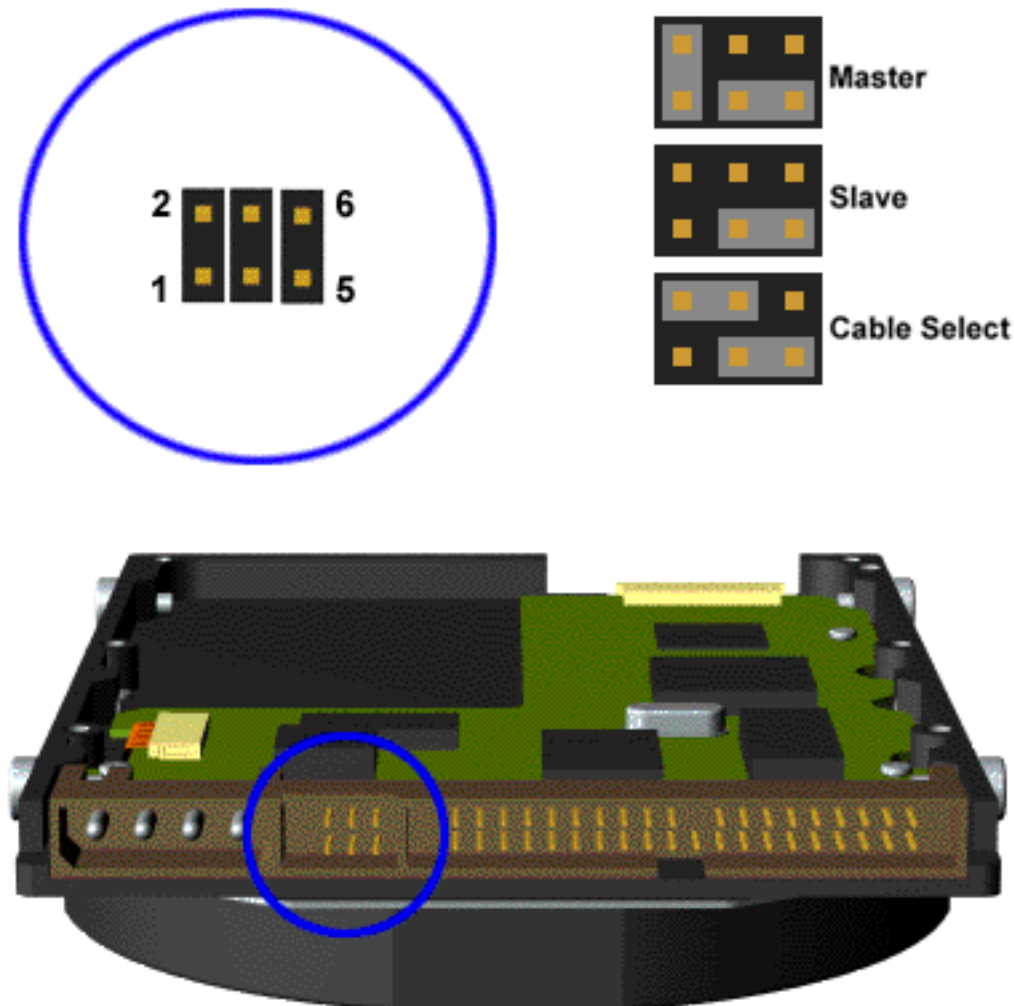
Hard drive

[CD drive](#)

JUMPER & SWITCH INFORMATION

Hard Drive

If your hard drive looks different from the one shown, check the [alternative hard drive](#) settings.



Fujitsu Hard Drive Jumper Settings

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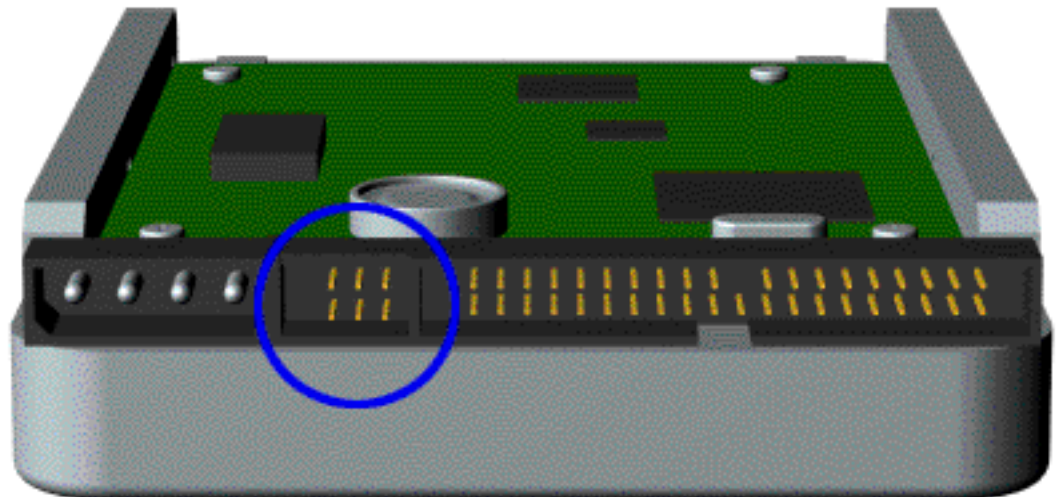
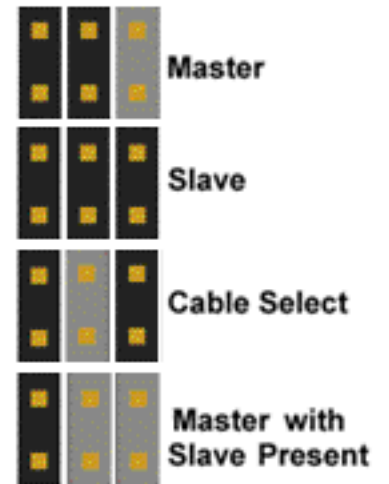
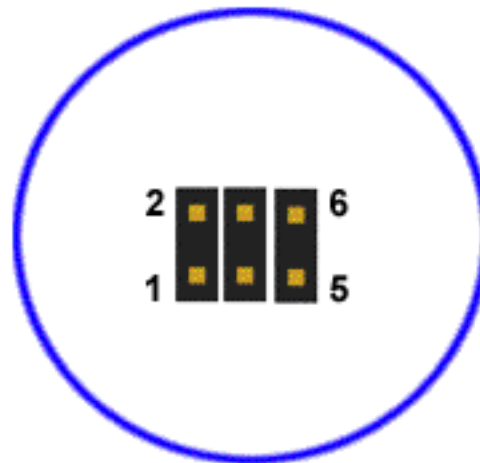
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Hard Drive (continued)

If your hard drive also looks different from this one (a Seagate drive), check the [other alternative hard drive](#) settings.



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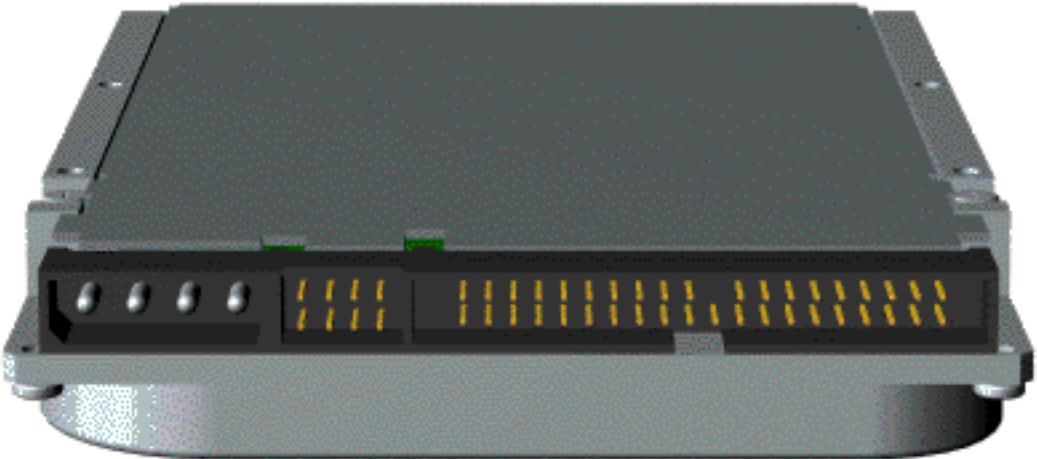
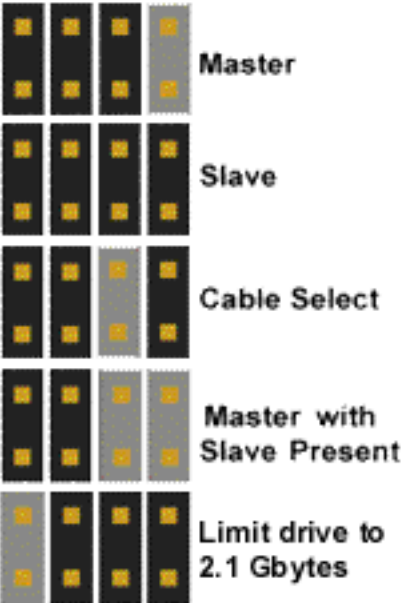
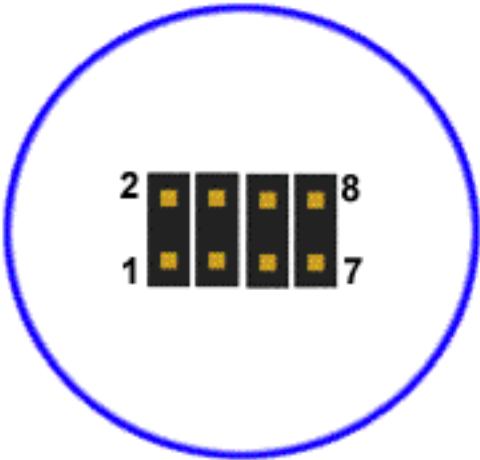
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This is another Seagate hard drive.



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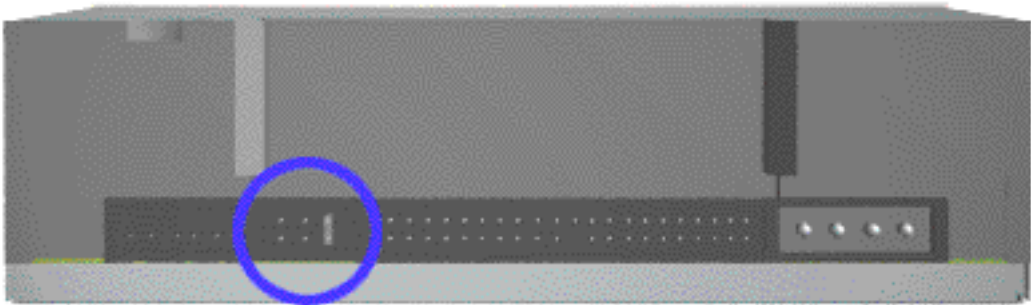
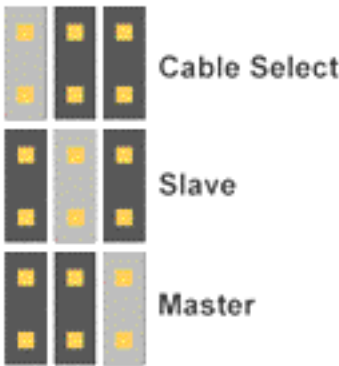
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SPECIFICATIONS

Please note:

Performance figures quoted are estimated *peak* values, rather than *average* values sustained during prolonged operation.

Hard Drives			
	2.1 GB	4.3 GB	8.4 GB
Compaq Part Number	166820-001	314095-002	334180-002
Formatted Capacity, MB	2111.86	4311.0	8455.0
Transfer Rate:			
Disk to buffer (Mbits/sec) Interface (MBytes/sec)	76.7 to 133.7 16.7 (non-UDMA) 33.3 (UDMA)	140 max 33.3 (UDMA)	140 max 33.3 (UDMA)
Seek Time (including settling):			
Track-to-track (ms) Average (ms) Full Stroke (ms)	2.5 - 5.0 10.0 - 14.0 19.0 - 24.0	1.3 - 1.7 11.0 - 11.5 19.8 - 20.2	1.3 - 1.7 11.0 - 11.5 19.8 - 20.2
Disk Rotational Speed (RPM)	5400 ± 0.5%	5400 ± 0.5%	5400 ± 0.5%
Data Cylinders:			
Physical Logical	8983 4092	8557 8912	8557 16383
Data Heads:			
Physical Logical	2 16	4 16	8 16
Sectors per Track:			
Physical Logical	168 - 300, ID - OD 63	180 - 306 63	180-306 63
Spin-up time, sec	8 - 16	10	10
Spin-down time, sec	20 - 30	10	10

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Please Note:

Performance figures quoted are estimated *peak* values, rather than *average* values sustained during prolonged operation.

32× CD Drive		
Dimensions	U. S.	Metric
Width	5.91 in	15.01 cm
Height	1.67 in	4.29 cm
Depth	8.23 in	20.80 cm
Weight	2.65 lb	1.20 kg
Capacity	540 MB (mode 1); 650 MB (mode 2)	
Applicable Disc		
CD-ROM CD-DA CD-XA Photo CD	Mode 1 and Mode 2 Audio Mode 2, Form 1 and 2 Single and Multiple Session	
Block Size		
CD-ROM Mode 1 CD-ROM Mode 2 CD-DA CD-XA	2048 bytes 2340, 2336 bytes 2352 bytes 2328 bytes	
Center Hole	15 mm diameter	
Diameter	12 cm, 8 cm	
Thickness	1.2 mm	
Track Pitch	1.6 μm	
Laser:		
Beam Divergence Output Power Type Wave Length	53.5 degrees +/- 1.5 degrees 0.14 mW Semiconductor laser GaAIAs 780 nm +/- 25 nm	
Access Time:		
Random Full Stroke	< 100 ms < 150 ms	
Audio Output Level:		
Line Out Headphone S/N Channel separation Frequency response	0.7 V (RMS) at 10 kW 0.6 V (RMS) at 32 W 80 dB minimum 65 dB minimum 20 Hz -- 20 kHz (+1/-3 dB)	
Cache Buffer	128 kB minimum	
Data Transfer Rate	150 kB/s (sustained, 1x, audio disc) 2100-4800 kB/s (14-32x variable)	
Bus Rate	16 MB/s	
Interface Cable Length (Max)	18 in	
Startup Time	single < 7 sec, multisession < 30 sec	
Stop Time	< 4 sec	

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<i>Mouse</i>		
Dimensions	U. S.	Metric
Height	1.34 in	3.4 cm
Length	4.45 in	11.3 cm
Width	2.36 in	6.0 cm
Weight	4.59 oz	130 g
Base Resolution	400 DPI	15.8 dots/mm
Maximum Tracking Speed	10 in/sec	25 cm/sec
Acceleration	100in/sec ²	2.5 m/sec ²
Temperature		
Operating	32° F to 104° F	0° C to 40° C
Storage	-4° F to 140° F	-20° C to 60° C
Lifetime		
Mechanical	Exceeds 300 miles	Exceeds 483 km
Switch	Exceeds 1 million operations	Exceeds 1 million operations
Relative Humidity	10% to 90%, noncondensing	
ESD	No soft errors through 6 kV; no hard errors through 6 kV; specific performance depends on host system	

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Fax-modem

**Maximum Data
Speed (kbps)**

56*

Data

V.90, K56Flex, V.34, V.32terbo, V.32bis, V.32,
V.22bis, V.22, V.21, Bell 212A, Bell 103

Error Correction

V.42bis, V.42, LAPM, and MNP 2-5

Fax

V.17 (14.4 kbps transmission speed) V.29,
V.27ter, V.21 Channel 2, Class 1 command
set, Group III FAX

* Both K56flex and V.90 are designed only to allow faster downloads from either K56flex or V.90 compliant digital sources. Maximum achievable download transmission rates are currently unknown, may not reach 56kbps, and will vary with line conditions.

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<i>Diskette Drive</i>	
Diskettes:	
Size High Density (MB) Low Density (KB)	3.5" (8.89 cm) 1.44 720
Bytes per Sector	512
Sectors per Track:	
High Density Low Density	18 9
Tracks per Side:	
High Density Low Density	80 80
Read/Write Heads	2
Average Seek Time (ms):	
Track-to-Track Average Settling Time Latency Average	3 94 15 100

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74W Power Supply		
Input Specifications	U. S.	Outside U. S.
Nominal Line Voltage	100 to 120 VAC	220 to 240 VAC
Range Input Line	90 to 132 VAC	180 to 264 VAC
Frequency Range	47 to 63 Hz	47 to 63 Hz
Power Factor	0.6	0.6
Input Power	106.5 W at 90 VAC	106.5 W at 180 VAC
Input Current	1.93 A at 90 VAC	0.937 A at 180 VAC
Inrush Current	90 A / 10 ms max	90 A / 10 ms max
Holdup Time	16 ms from zero crossing at 120 VAC	16 ms from zero crossing at 240 VAC
General Specifications		
Full Output Rating	To 122° F and 5,000 ft To 90° F and 10,000 ft (derate linearly)	To 50° C and 1524 m To 32° C and 3048 m (derate linearly)
Minimum Load	1.0 A on + 5.0 V output	1.0 A on + 5.0 V output
Ambient Temperature Range		
Operating	50° to 122° F	10° to 50° C
Storage	-40° to 151° F	-40° to 66° C
Dielectric Voltage Withstand		
Input to Ground	2500 VAC per second	
Safety Standard		
UL 1950; CSA 22.2 #950 or CSA 22.2 #234; TUV/VDE EN 60 950 (VDE0805/11.91); EMKO-TSE (74-SEC) 207/93		
Input Transient Susceptibility		
Common and Differential Mode (superimposed on AC line)	2500 V, 1 μs, damped sinusoidal 600 V, 10 μs pulse	
Differential Mode	20% step change in AC input voltage	

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- System interrupts
- System I/O map
- System memory
- System DMA

General System Specifications		
Dimensions	U. S.	Outside U. S.
Height	4.03 in	10.24 cm
Depth	15.66 in	39.78 cm
Width	13.85 in	35.18 cm
Shipping Weight		
Gross	28 lbs (approx)	13 kg (approx)
Net	17.05 lbs	7.74 kg
Input Requirements		
Nominal Line Voltage	100 to 120 VAC	220 to 240 VAC
Range Line Voltage	90 to 132 VAC	180 to 264 VAC
Line Frequency	47 to 63 Hz	47 to 63 Hz
Input Current	5.2 at 90 VAC	3.6 at 180 VAC
Power (watts)		
Steady State	74	74
BTUs	< 178 BTU/hour*	
*This number will increase if more bays/slots are occupied.		
Environmental Requirements		
Temperature	U. S.	Outside U. S.
Operating	50° to 95°F	10° to 35°C
Shipping	-22° to 140°F	-30° to 60°C
Humidity (noncondensing)		
Operating	20% to 80%	
Nonoperating	5% to 95%, 38.7°C max wet bulb temp.	
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m

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To determine any of these system settings, follow these steps:

1	Click on Start
2	Navigate to Programs ➤ Accessories ➤ System Tools ➤ System Information
3	In the lefthand frame, click on Hardware Resources
4	Select the setting type you are interested in, and the settings will appear in the righthand frame.

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System I/O Map				
Low I/O Address	High I/O Address	Function	Alternative Mappings	Device
0000	000F	DMA Controller #1		South Bridge
0010	001F	DMA Controller Aliases		South Bridge
0020		Interrupt Controller #1 Control Register		South Bridge
0021		Interrupt Controller #1 Mask Register		South Bridge
0022	003D	Interrupt Controller Aliases		South Bridge
0040	0043	Counter/Timer		South Bridge
0044	004F			Not used
0050	0053	Counter/Timer Aliases		South Bridge
0053	005F			Not used
0060		Keyboard Controller Data Register		South Bridge
0061		Port B: SERR/IOCHK NMI, Speaker, Refresh		South Bridge
0062	0063			Not used
0064		Keyboard Controller Command/Status Register		South Bridge
0065	006F			Not Used
0070		NMI Mask Register (Bit 7)		South Bridge
0070		RTC/Configuration Memory Index Port (Bit 6:0)		South Bridge
0071		RTC/Configuration Memory Data Port		South Bridge
0072		RTC Extended Index		South Bridge
0073		RTC Extended Data		South Bridge
0074	007F			Not Used
0080	008F	DMA Page Registers		South Bridge
0090	0091	Alias of DMA page registers if SOUTH BRIDGE.4C.7=0		South Bridge Not Used
0092		Port 92 (fast reset and A20 gate)		South Bridge
0093	009F	Alias of DMA page registers if SOUTH BRIDGE.4C.7=0		South Bridge Not used
00A0		Interrupt Controller #2 Control Register		South Bridge
00A1		Interrupt Controller #2 Mask Register		South Bridge
00A2	00B1			Not Used
00B2		APM Control		South Bridge
00B3		APM Status		South Bridge
00B4	00BF			Not Used
00C0	00DF	DMA Controller #2		South Bridge

[System I/O Map](#) continued...

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To determine any of these system settings, follow these steps:

1	Click on Start
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System I/O Map, cont'd				
Low I/O Address	High I/O Address	Function	Alternative Mappings	Device
00E0		ESS Index Register		Audio
00E1		ESS Data Register		Audio
00E2	00E3	DDC2 Registers		
00E4	00E9			Not used
00EA		Ultra I/O Index Register		Super I/O
00EB		Ultra I/O Data Register		Super I/O
00EC	00EF	Modem configuration		Modem
00F0	00F1	Coprocessor Busy Clear/Reset		South Bridge
00F2	00F8			Not Used
00F9		Lock Configuration Register (Dummy Write)		Audio, Modem, Super I/O
00FA				Not used
00FB		Unlock Configuration Register (Dummy Write)		Audio, Modem, Super I/O
00FC		TV/MPEG Configuration Register to remap base I/O address and interrupt resource		
00FD	00FF			Not Used
0100	0101			Not Used
0102		Video: POS. 102 register		Video
0103	012F			Not Used
0130	0131	BGL Index/Data for second line modem See 260 for controllerless modems		Modem
0132	016F			Not Used
0170	0177	Secondary IDE Controller		South Bridge
0178	01EF			Not Used
01F0	01F7	Primary IDE Controller		South Bridge
01F8	0200			Not Used
0201		Joystick Port	200,202,203	Audio
0202	021F			Not Used
0220	022F	Audio Controller	0230-023F, 0240-024F, 0250-025F	Audio
0230	025F			Not Used
0260	0263	Reserved-Modem use during POST		
0264	0277			Not Used
0278	027F	Reserved-Parallel Port	0378	Super I/O
0280	02E7			Not Used

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2	Navigate to Programs ➔ Accessories ➔ System Tools ➔ System Information
3	In the lefthand frame, click on Hardware Resources
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System Memory Map			
Size	Low Address	High Address	System Function
640 KB	00000000	0009FFFF	Base Memory
128 KB	000A0000	000BFFFF	Video RAM
48 KB	000C0000	000CBFFF	Video ROM
16 KB	000CC000	000CFFFF	Unused
48 KB	000D0000	000DBFFF	Unused
16 KB	000DC000	000DFFFF	Used
64 KB	000E0000	000EBFFF	Used
64 KB	000F0000	000FFFFF	System BIOS ROM shadow image
15 MB	00100000	00FFFFFF	Standard Extended Memory
64 MB	01000000	04FFFFFF	Rest of Extended Memory
60 MB	05000000	07FFFFFF	Unused
512 KB	08000000	0807FFFF	Standard Direct Video Memory
512 KB	08080000	080FFFFF	Optional Direct Video Memory
1919 MB	08100000	7FFFFFFF	Unused
16 MB	80000000	80FFFFFF	Memory mapped I/O devices
~2000 MB	81000000	FDFDFFFF	Unused/System ROM aliases
128 KB	FDFE0000	FDFFFFFFFF	System ROM (alias)
~32 MB	FE000000	FFFDFFFF	Unused
128 KB	FFFE0000	FFFFFFFF	System BIOS ROM

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To determine any of these system settings, follow these steps:

- | | |
|---|---|
| 1 | Click on Start |
| 2 | Navigate to Programs ➔ Accessories ➔ System Tools ➔ System Information |
| 3 | In the lefthand frame, click on Hardware Resources |
| 4 | Select the setting type you are interested in, and the settings will appear in the righthand frame. |

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System DMA Channels			
Default DMA	Function	Alternative Mapping	Device
DMA0	Audio Record	1, 3, Disabled	Audio Controller
DMA1	Audio Playback	0, 3, Disabled	Audio Controller
DMA2	Floppy Controller	N/A	Super I/O
DMA3	ECP Printer Port	0, 1, 2, Disabled	Super I/O
DMA4	Internal Cascade	N/A	South Bridge
DMA5	Available		South Bridge
DMA6	Available		South Bridge
DMA7	Available		South Bridge

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To determine any of these system settings, follow these steps:

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System Interrupts				
Default IRQ	PIR	Function	Alternative Mappings	Device
IRQ0		Timer	N/A	South Bridge
IRQ1		Keyboard	N/A	South Bridge
IRQ2		Internal 8259 Cascade	N/A	South Bridge
IRQ3	X	Modem	Model Specific	Modem
IRQ4	X	COM1 Serial Port	3, Disabled	Super I/O
IRQ5	X	Audio	7, 9, 10, 11, Disabled	Audio Controller
IRQ6	X	Floppy Disk Controller	Disabled	Super I/O
IRQ7	X	LPT1 Parallel Port	3, 4, 5, 9, 10, Disabled	Super I/O
IRQ8		Real Time Clock	N/A	South Bridge
IRQ9	X	USB, NIC	PIR	USB Controller
IRQ10	X			
IRQ11	X			
IRQ12	X	PS/2 Mouse	Disabled	South Bridge
IRQ13		Numeric Coprocessor	Disabled	South Bridge
IRQ14	X	Primary IDE	PIR, Disabled	IDE Controller
IRQ15	X	Secondary IDE	PIR, Disabled	IDE Controller

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To determine any of these system settings, follow these steps:

1	Click on Start
2	Navigate to Programs ➡ Accessories ➡ System Tools ➡ System Information
3	In the lefthand frame, click on Hardware Resources
4	Select the setting type you are interested in, and the settings will appear in the righthand frame.