COMPAQ

MAINTENANCE & SERVICE GUIDE

Compaq Deskpro 2000
Series of Personal Computers

Pentium Processor with MMX Technology
and Pentium II Processor

September 1997 Edition

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Maintenance and Service Guide

Compaq Deskpro 2000 Series of Personal Computers
Pentium Processor with MMX Technology
and Pentium II Processor

CONTENTS

chapter 2
Compaq Utilities

preface

ABOUT THIS GUIDE

This *Maintenance and Service Guide* is a troubleshooting and repair guide that can be used for reference when servicing the Compaq Deskpro 2000 Series of Personal Computers. Only authorized technicians trained by Compaq should attempt to repair this equipment.

Compaq Computer Corporation reserves the right to make changes to the Compaq Deskpro 2000 Series of Personal Computers without notice.

Symbols and Conventions

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

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

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

✎ Text set off in this manner presents commentary, sidelights, clarifying information, or specific instructions.

The following format conventions distinguish elements of the text throughout this guide:

■ Drive letters that are not in command lines are presented in uppercase type as shown here: drive A.

■ Directory or folder names that are not in command lines are presented in uppercase type as shown here: DIRECTORY or FOLDER.

■ The file names are presented in uppercase italic type as shown here: *FILENAME.*

■ The names of commands are presented in lowercase as shown here: install or a:\install.

■ Commands that are to be entered at the system prompt may be shown on a separate line:

   a:install

■ When you need to type information without pressing Enter, you are directed to "type" the information.

■ When you need to type the information *and* press Enter, you are directed to "enter" the information.

Technician Notes

⚠ **WARNING**: 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.

⚠ **CAUTION:** 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.

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

System Serial Number

The location of the serial number for the desktop computer is found in Chapter 5 and for the minitower computer in Chapter 6 in this guide.

For the purpose of AssetControl, the serial number is embedded in the CMOS on the system board.

Locating Additional Information

The following documentation is available to support these products:

- User Documentation

- Technical Training Guides

- Compaq Service Advisories and Bulletins

- Compaq QuickFind

- *Technical Reference Guide*

- *Compaq Service Quick Reference Guide*

- *Compaq SmartStart for Workstations CD* online documentation

chapter 1

PRODUCT DESCRIPTION

This chapter describes the model offerings and features of the Compaq Deskpro 2000 Series of Personal Computers.

Figure 1-1. *Compaq Deskpro 2000 Series Personal Computer*

1.1 Compaq Deskpro 2000 Series of Personal Computer Models

The Compaq Deskpro 2000 Series of Personal Computers is available in both desktop and minitower configurations. This series of personal computers uses the Intel family of Pentium processors consisting of the Intel Pentium processor and the Intel Pentium II processor. Both processors utilize MMX technology. These configurations are described in the following sections.

1.1.1   Desktop Models

Table 1-1
Desktop Models

Configuration Code	Processor	Hard Drive	CD-ROM	Memory	Maximum Memory	Internal Cache	Graphics
Pentium Processor							
BK52	P55C/166	2.1-GB		16-MB	384-MB	256K	S3 Trio64V2/GX
BK53	P55C/166	2.1-GB	16X	32-MB	384-MB	256K	S3 Trio64V2/GX
BK54	P55C/166	3.2-GB		32-MB	384-MB	256K	S3 Trio64V2/GX
BK55	P55C/166	3.2-GB		16-MB	384-MB	256K	S3 Trio64V2/GX
BK62	P55C/200	2.1-GB		16-MB	384-MB	256K	S3 Trio64V2/GX
BK63	P55C/200	3.2-GB	16X	32-MB	384-MB	256K	S3 Trio64V2/GX
BK64	P55C/200	3.2-GB		32-MB	384-MB	256K	S3 Trio64V2/GX
BNT2	P55C/233	3.2-GB	16X	32-MB	384-MB	256K	S3 Trio64V2/GX
Pentium II Processor							
BMJ2	PII/233	2.1-GB		32-MB	384-MB	512K	Matrox MGA-1064SG
BMK2	PII/233	3.2-GB	24X	32-MB	384-MB	512K	Matrox MGA-1064SG
BML2	PII/266	3.2-GB	24X	32-MB	384-MB	512K	Matrox MGA-1064SG

✎   Some models may not be available in all countries.

1.1.2   Minitower Models

Table 1-2
Minitower Models

Configuration Code	Processor	Hard Drive	CD-ROM	Memory	Maximum Memory	Internal Cache	Graphics
Pentium Processor							
BK72	P55C/166	3.2-GB	16X	32-MB	384-MB	256K	S3 Trio64V2/GX
BK82	P55C/200	3.2-GB	16X	32-MB	384-MB	256K	S3 Trio64V2/GX
Pentium II Processor							
BMM2	PII/266	3.2-GB	24X	32-MB	384-MB	512K	Matrox MGA-1064SG
BR32	PII/300	3.2-GB	24X	32-MB	384-MB	512K	Matrox MGA-1064SG

✎   Some models may not be available in all countries.

1.2 Features

The Compaq Deskpro 2000 Series of Personal Computers have the following standard features:

1.2.1 Pentium System Feature Summary

■ Intel Pentium Processor with MMX technology running at speeds of 166, 200, and 233 megahertz

■ 256-KB (L2) cache secondary standard, expandable to 512-KB

■ 16- or 32-megabyte synchronous dynamic random access memory (SDRAM) standard depending on the model, expandable to 384 megabytes of SDRAM installed in dual inline memory modules (DIMMs)

■ One Enhanced IDE (EIDE) SMART II hard drive installed

■ One 16X Max EIDE CD-ROM drive, Compaq Business Pro 16-bit audio board, and an enhanced speaker installed on select models

■ S3 Trio64V2/GX enhanced 64-bit graphics controller with 1 MB of memory installed on the system board, expandable to 2 megabytes

■ Microsoft Windows 95 operating system software

1.2.2 Pentium II System Feature Summary

■ Intel Pentium II Processor with MMX technology running at speeds of 233, 266, and 300 megahertz

■ One Ultra ATA (ultra direct memory access or UDMA) SMART II hard drive installed

■ 32-megabyte SDRAM standard, expandable to 384 megabytes of SDRAM installed in dual inline memory modules (DIMMs)

■ 512-KB (L2) cache secondary standard, not upgradable

■ One 24X Max EIDE CD-ROM drive, Compaq Business Pro 16-bit audio board, and an enhanced speaker installed on select models

■ Matrox MGA-1064SG graphics accelerator controller with 2 MB of synchronous graphics random access memory (SGRAM) installed on the system board, expandable to 4 MB

■ Microsoft Windows NT 4.0 operating system software

1.2.3 Features Common to Both

■ One 1.44-megabyte, 3.5-inch high-density diskette drive installed

■ Peripheral Components Interconnect (PCI) chipset used for PCI/ISA, two USB ports, memory, and peripheral control

■ Super I/O controller which integrates a serial port, parallel port, diskette drive interface, real-time clock, CMOS RAM, and mouse and keyboard controller

■ PCI and ISA peripheral connectors on the expansion riser board

■ BIOS in a flash memory device which supports PCI auto-configuration

■ Desktop chassis, including expansion slots for up to five expansion boards

❏ Two dedicated half-length PCI slots
❏ Two dedicated ISA-bus slots (one half-length and one full-length)
❏ One full-length "combination" slot for either a PCI or an ISA expansion board
❏ Surge-tolerant continuous power supply, switch-selectable for 115 and 230 VAC operation

■ Minitower chassis, including expansion slots for up to five expansion boards

❏ Two dedicated full-length PCI slots
❏ Two dedicated full-length ISA-bus slots
❏ One full-length "combination" slot for either a PCI or an ISA expansion board
❏ Surge-tolerant continuous power supply, switch-selectable for 115 and 230 VAC operation

■ One RS-232C compatible 9-pin serial connector

■ One multimode, 25-pin enhanced parallel connector

■ Two Universal Serial Bus (USB) connectors on all models

■ Five drive bays on desktop models:

❏ One external 3.5-inch, one-third height diskette drive bay
❏ One internal 3.5-inch, one-third height drive bay
❏ Two external 5.25-inch, one-half height drive bays *or* one full-height drive
❏ One internal 5.25-inch one-third height hard drive bay

■ Five drive bays on minitower models:

❏ One external 3.5-inch, one-third height diskette drive bay
❏ One internal 3.5-inch, one-third height drive bay
❏ Three external 5.25-inch, one-half height drive bays

■ Compaq Business Pro 16-bit audio board and an enhanced speaker installed on select models

■ Hard drive fault protection standard on all SMART II hard drives

■ Compaq Enhanced Keyboard, featuring the Microsoft Windows–specific keys

- Mouse

- Keyboard and mouse connectors on the back panel

- Internal piezo speaker mounted on system board

- Intelligent Manageability and security features, including password and cable lock provision

- Compaq Diagnostics and Configuration utilities, support software, and device drivers

1.3 System Design

This section presents a design overview and functional descriptions of the key components of the Compaq Deskpro 2000 Series of Personal Computers. All replaceable components are identified in Chapter 3, and removal/replacement instructions are presented in Chapters 5 and 6.

1.3.1 Design Overview

The desktop models of the Compaq Deskpro 2000 Series of Personal Computers have a conventional design that uses a pan-type chassis to house the system board, expansion cards, power supply, and mass storage devices. The chassis is supplemented by a riser board attached to the riser brace. The riser board provides a mounting location for the expansion cards.

All internal components are accessible when the hood, held in place by two thumbscrews, is removed. The front bezel is mounted to the front of the chassis. Torx T-15 screws are used throughout the system.

The system board is easily removed from the side of the chassis after the hood and riser board are removed. Details of the disassembly procedure for desktop models are found in Chapter 5, "Removal and Replacement Procedures."

The riser board mounts perpendicularly to the system board. Expansion boards are installed horizontally into the riser board. A single screw attaches each expansion board to the rear panel of the chassis.

The power supply is mounted in the right rear corner of the chassis. The power supply is held in place by three Torx screws that are installed through the rear panel of the chassis.

The minitower models have a chassis designed to house the system board, riser board, option cards, power supply, and mass storage devices. The use of a riser brace to hold the riser board, and any expansion boards installed, allows for easy access to the system board. The power supply is mounted in the top of the unit.

All internal components are immediately accessible when the side panel is removed.

The minitower's tray-mounted system board is easily removed after taking off the side panel and riser brace. Details of the disassembly procedure for minitower models are found in Chapter 6, "Removal and Replacement Procedures."

Detailed descriptions of the system components are presented in the sections that follow.

1.3.2   System Board

The desktop and minitower models of the Compaq Deskpro 2000 Series of Personal Computers have a single system board configuration. The Pentium system board uses an Intel Pentium processor. The Pentium II system board uses the Intel Pentium II processor. The processors are designed using MMX technology. The desktop units of both systems have the I/O panel mounted to the system board and is spared with the I/O panel. On the minitower, the system board is attached to a sliding tray and is spared with the tray.

1.3.3   Processor

The Pentium system boards run at processor speeds of 166 MHz, 200 MHz, or 233 MHz depending on the model. A computer with a processor speed of 166 MHz can be upgraded to a processor speed of either 200 MHz or 233 MHz. A computer with processor speed 200 MHz can be upgraded to a processor speed of 233 MHz.

The Pentium II system boards run at speeds of 233 MHz, 266 MHz, or 300 MHz. A Pentium II system with a processor speed of 233 MHz can be upgraded to a processor speed of either 266 MHz or 300 MHz, and a Pentium II system with a processor speed 266 MHz can be upgraded to a processor speed of 300 MHz.

Utilizing MMX technology in the design of the processors enhances the systems' ability to take advantage of the MMX instructions while preserving compatibility with existing software and operating systems

1.3.4   System Memory

The system supports base (conventional) and extended memory. Operating systems such as MS-DOS, OS/2, UNIX, and all application programs use base memory. For better performance, Windows NT, OS/2, and UNIX, as well as many MS-DOS applications, use extended memory.

For proper system operation, the DIMMs must be industry standard 168-pin, 66-MHz or faster unbuffered SDRAM DIMMs. The memory modules may also be unbuffered extended data out (EDO) DIMMs. SDRAM DIMMs must support CAS Latency 2 or 3 (CL = 2 or CL = 3) with a data access time (clock to data out) of 9.0 ns or less. The DIMMs must also contain Joint Electron Device Engineering Council (JEDEC) Serial Presence Detect (SPD) information. SDRAMS on DIMMs must have a data width of x8, x16, or x32; x4 is not supported. The system will not start using unsupported DIMMs or incompatible DIMM configurations. See Appendix H, "Intel 440LX Chipset Memory limitations," for incompatible and unsupported DIMM configurations. Refer to Chapters 5 and 6, "Removal and Replacement Procedures," for information on how to upgrade system memory.

1.3.5   Cache Memory

Cache memory is very fast memory used for temporarily storing data for fast access by the processor. The faster the processor, the more need there is for faster temporary data storage. A 256 KB write-through, direct-mapped secondary (L2) cache is integrated onto the system board on all Pentium models. The L2 cache memory for the Pentium models may be increased to 512 KB with the addition of an optional plug-in module on the system board.

L2 cache memory for all Pentium II models is integrated in the processor module with a capacity of 512 KB and is not upgradable.

1.3.6   Graphics Controllers

The purpose of a graphics controller is to generate the text and graphics images for the monitor screen. The quality of the picture you see depends on the resolution of the monitor, the number of colors the graphics controller can display, and the amount of graphics memory available. High resolution graphics with many colors require that the graphics controller have its own memory system.

The Pentium computers come with the S3 Trio64V2/GX Enhanced 64-bit graphics controller integrated onto the system board and have 1 MB of SGRAM installed. Graphics memory on these models may be upgraded to 2 MB with the addition of an optional memory module.

The Pentium II computer comes with the Matrox MGA-1064SG graphics accelerator integrated onto the system board and has 2 MB of SGRAM installed. Graphics memory on these models may be upgraded to 4 MB with the addition of an optional memory module.

Supported screen resolutions for the controller are listed in Chapter 8, "Specifications."

1.3.7   Chipsets

VIA Chipset

The Pentium system uses the VIA Apollo VP2/AMD-640 chipset. This provides a high-speed, 32-bit PCI/IDE (EIDE) interface, which supports the following:

■   Up to four PCI/IDE (EIDE) devices on the PCI bus

■   SDRAM and EDO DIMM support

■   ECC DIMM support

440LX Chipset

The Intel 440LX chipset is designed specifically for the Pentium II system. This provides support for the latest technologies, including the following:

■   Up to four PCI/IDE (EIDE) devices on the PCI bus *or* four Ultra ATA devices

■   Ultra ATA Mode 2 support

■   SDRAM and EDO DIMM support

■   ECC DIMM support

1.3.8　System I/O

The onboard I/O controller integrates the functions for the serial and parallel ports, diskette drives, the keyboard and mouse. This component provides support for the following:

■ Multimode bidirectional parallel port

❏ Standard mode: Centronics-compatible operation

❏ High-speed mode with support for an enhanced capabilities port (ECP) and enhanced parallel port (EPP)

■ One RS-232C compatible 9-pin serial port

■ Integrated real-time clock

■ 242-byte, battery-backed CMOS RAM

■ Integrated 8042-compatible keyboard controller

■ Industry-standard diskette drive controller that supports 360-kilobyte and 1.2-megabyte 5.25-inch drives

1.3.9　System BIOS

The system BIOS provides ISA and PCI compatibility. Contained in a flash memory device on the system board, the BIOS provides both the Power-On Self-Test (POST) and PCI and EIDE auto-configuration utilities.

The system BIOS is always "shadowed." Shadowing allows any BIOS routines to be executed from fast 64-bit onboard DRAM instead of from the slower 8-bit flash device.

PCI Auto-Configuration

The PCI auto-configuration utility works in conjunction with the Setup program to support using PCI expansion boards in the system. When you turn on the computer power after installing a PCI board, the BIOS automatically configures interrupts, I/O space, and PCI devices. If problems arise or you wish to reconfigure the device, refer to Chapter 2, "Compaq Utilities," which explains how to use the Setup program. The PCI auto-configuration program complies with version 2.1 of the PCI BIOS specification.

IDE/EIDE Auto-Configuration

If you install an IDE/EIDE drive into the computer, the IDE/EIDE auto-configuration utility automatically detects and configures the drive for operation in the computer. This utility eliminates the need to run the Setup program after you install an IDE/EIDE drive.

ISA Plug and Play Capability

ISA Plug and Play capability provides auto-configuration of Plug and Play ISA boards and resource management for legacy (non–Plug and Play) ISA boards when used with Computer Setup or a Plug and Play–compatible operating system like Microsoft's Windows 95.

BIOS Upgrades

Because the BIOS is stored in a flash memory device, you can easily upgrade the BIOS without having to disassemble the system. The flash upgrade process can be accomplished by running a utility from a diskette, a hard drive, or over a network.

The section on Flash ROM in Chapter 2, "Compaq Utilities," explains how to run the BIOS upgrade utility.

1.3.10 Expansion Slots

The computer has two dedicated 16-bit ISA-compatible slots, two dedicated PCI-compatible expansion slots, and one "combination slot" that can be used by either a PCI or an ISA board. For more information about expansion slots and installing expansion boards, see Chapters 5 and 6, "Removal and Replacement Procedures."

1.3.11 Power Supply

The power supply provides power for system requirements including onboard resources, expansion boards, and drives. The desktop system supports a maximum of 145-watts of continuous power. The minitower system supports a maximum of 185-watts of continuous power. The same power supply, rated at 200-watts maximum output, provides for both system requirements. The power supply has integrated surge protection to withstand a 2,000 volt power surge. A switch on the computer back panel sets the power supply to operate at:

■ 115 VAC (in the range of 100-120 VAC)

■ 230 VAC (in the range of 200-240 VAC)

1.3.12 Diskette Drive Interface

The diskette drive interface is 8477 compatible and supports two storage devices (diskette or tape drive).

1.3.13 Serial Port

The serial port is RS-232C compatible.

1.3.14 Parallel Port

The following parallel support modes are supported:

■ Bidirectional Standard Parallel Port (SPP)

■ Enhanced Parallel Port (EPP)

■ Extended Capabilities Port (ECP)

1.3.15 System Security

The system BIOS provides a power-on password option that is enabled through the Setup program. The computer includes a cable lock provision that makes it possible to lock the computer cover in place to prevent unauthorized access to the system jumpers and other internal components (a padlock is not included). For more information on this and additional security features, refer Chapter 2, "Compaq Utilities."

1.3.16 Keyboard/Mouse Controller

The onboard 8042 I/O controller stores the keyboard and mouse controller code. Connectors for the keyboard and mouse are located on the back panel.

1.3.17 Real-Time Clock and CMOS RAM

The onboard I/O controller provides a real-time clock and CMOS RAM. Chapters 5 and 6, "Removal and Replacement," provide information about installing a new battery.

You can set the time for the clock and the CMOS values by using the Setup program described in Chapter 2, "Compaq Utilities."

1.3.18 Power Supply Fan

For cooling, a fan is incorporated as part of the power supply at the rear of the computer chassis. The fan draws air in through the front of the chassis and exhausts air out the rear of the chassis. This provides adequate air flow across the processor.

To insure that the processor in a Pentium II minitower system receives adequate ventilation, an internal air duct is installed in the front of the unit.

1.3.19 Speaker

An internal piezo speaker is mounted on the system board. The speaker provides audible error code information (beep codes) during the Power-On Self-Test (POST) and as required by the software. See Appendix F, "POST Error Messages," for beep code information.

1.3.20 Software

The Pentium computer configurations are shipped with Windows 95 installed as the operating system. The Pentium II configurations ship with Windows NT 4.0 as the operating system.

Preloaded Software

The following Compaq software is preloaded on the computer:

■ Partition-based Compaq Diagnostics utilities

■ Compaq Diagnostics for Windows

■ Compaq Insight Management Agent

■ Desktop Management Interface (DMI) Support

- Compaq support software and device drivers

- Online *Safety & Comfort Guide*

- Intelligent Manageability

- Power Management with Energy Saver features

- Security Management

  ✎ Certain drivers and utilities are available only in select languages.

1.3.21 Ordering Additional Operating System Drivers

If you plan to run any of the following operating systems on the computer, you must install the corresponding Compaq device drivers and utilities before attempting to use the computer:

- IBM OS/2 or NetWare

- A version of Microsoft Windows 95 or Windows NT Workstation that is different from the version included with the computer

There are three methods to obtain copies of suitable device drivers and utilities:

- Order the *Support Software CD for Compaq Desktop Products.* This compact disc contains the latest device drivers, utilities, and flashable ROM images needed to run MS-DOS, Windows 95, Windows NT Workstation 4.0, IBM OS/2, and NetWare on the Compaq commercial desktop product.

- Purchase backup diskettes.

- Access to the World Wide Web at www.compaq.com.

The *Support Software CD* can be purchased in either of two ways:

- A single CD-ROM that gives one-time access to the latest support software (North America only)

- A yearly subscription that delivers up to 12 monthly CD-ROMs

The annual subscription provides continuous access to the latest Compaq Deskpro software drivers, utilities, and ROM revisions.

  ✎ When calling Compaq to place an order, be sure to have the serial number of the computer available. The location of the serial number is shown in Chapters 5 and 6 for the desktop and minitower computers respectively. This number is necessary for all purchases.

1.3.22 Intelligent Manageability

Intelligent Manageability includes:

- Asset Management

- Configuration Management

- Integration Management

- Fault Management

- Security Management

Asset Management

AssetControl is a component of Asset Management that allows a system administrator to view, track, and store information about the computer. This capability is available locally with the Diagnostics for Windows utility or remotely with third-party applications. The following information is provided:

- System serial number

- Asset tag

- Monitor serial number (with monitor support)

- ROM revision levels

- System board revision level

- Hard drive model and serial number

- DIMM serial number, model, and speed

Configuration Management

Compaq has made the task of locating, accessing, evaluating, and installing the latest support software easier. Configuration Management includes:

- Remote ROM flash

- Remote security management

- Replicated setup

- Enhanced support software

- Failsafe boot block ROM

Integration Management

Compaq standardizes system manageability and provides access to PC configuration with its Integration Management solution. Through hardware and software instrumentation that supports the Desktop Management Interface (DMI) framework as established by the Desktop Management Task Force (DMTF), Integration Management delivers:

■ DMI compliance, DMI 2.0 support

■ Insight Management agent

■ Insight Manager support

■ Desktop Management Solution Partners support

Fault Management

Fault management is available locally at power-on or through the Diagnostics for Windows utility. When this feature is used with the appropriate management software and operating system, system administrators and users can monitor the computer for impending component or subsystem failure. This includes:

■ ECC memory fault reporting (with ECC memory only)

■ SMART compatible IDE/EIDE and SCSI (optional) hard drives

■ Monitor fault diagnosis

■ Pentium II fault prediction (Pentium II configuration only)

■ Pentium II Prefailure Warranty (Pentium II configuration only)

Security Management

Security management features are designed into the Compaq Deskpro Personal Computer. The following features prevent unauthorized access to critical data and prevent theft of the computer:

■ Cable lock provision allows the user to physically secure the computer hardware to protect against theft.

■ Removable media boot control prevents the computer from being booted from a diskette.

■ Removable media write control prevents unauthorized writing of data to a diskette.

■ Power-on password prevents unauthorized persons from booting up the computer.

■ QuickLock/QuickBlank allows the user to lock the keyboard and/or blank the screen.

■ Setup Password prevents unauthorized changes to the system configuration.

■ I/O port control prevents transfer of data through the I/O connectors.

1.4 Desktop Computer Features

The Compaq Deskpro 2000 Series of Personal Computers ships with a mouse and keyboard. A Compaq color monitor or other compatible monitor, which is also required to operate the computer, does not ship with the computer.

1.4.1 Front Panel Controls and LEDs

The operator controls and LEDs located on the front panel of the computer are identified and described below.
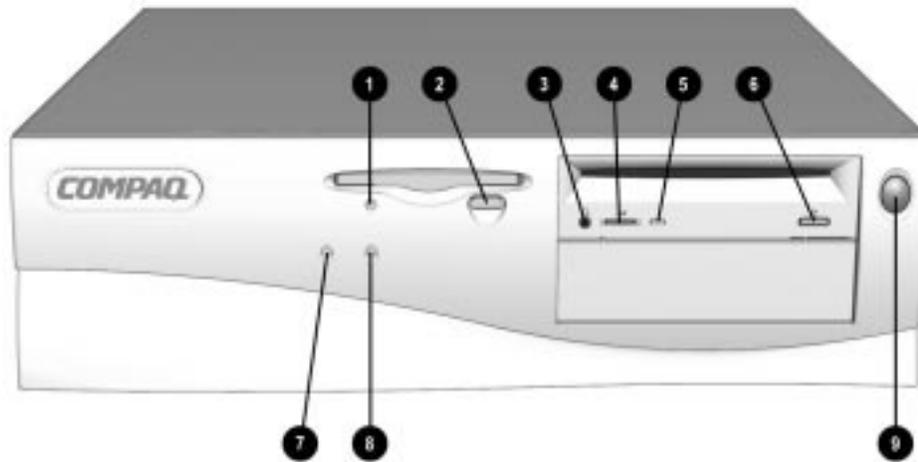
Figure 1-2. *Power Switch and Front Panel Lights*

Table 1-3
Lights and Controls

Ref.	Component	Function
❶	Diskette Drive Activity Light	Turns on when the diskette drive is reading or writing.
❷	Diskette Eject Button	Ejects a loaded diskette.
❸	CD-ROM Headphone Jack*	Connects a headphone to the CD-ROM drive.
❹	CD-ROM Headphone Volume Control*	Increases and decreases the CD-ROM headphone volume.
❺	CD-ROM Drive Activity Light*	Turns on when the CD-ROM drive is reading information from the compact disc.
❻	CD-ROM Eject Button*	Ejects a loaded disc.
❼	Power-On Light	Turns on when the computer is turned on.
❽	Hard Drive Activity Light	Turns on when the hard drive is reading or writing.
❾	Power Switch	Turns the computer on and off.

* Only available on models with CD-ROM.

1.4.2   Drive Positions
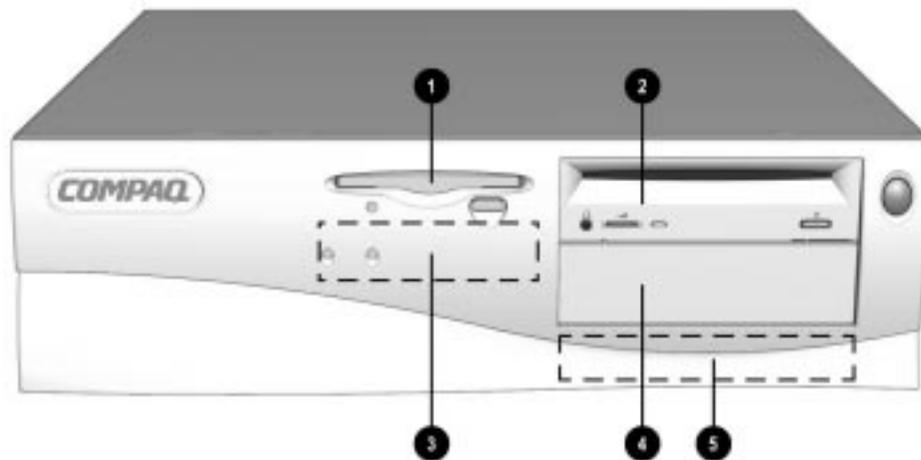
Figure 1-3. *Drive Positions on the Compaq Deskpro 2000 Desktop Computer*

The computer has space available for up to five mass storage devices. They may be installed in various configurations, including those shown in the following table.

Table 1-4
Compaq Deskpro 2000 Desktop Computer

Drive	Configuration
❶	Standard 3.5-inch 1.44-MB diskette drive
❷	Optional diskette drive (5.25-inch), tape drive, hard drive, LS-120 drive, or CD-ROM drive (half-height)
❸	Primary hard drive bay (3.5-inch, third-height)
❹	Optional diskette drive (5.25-inch), tape drive, hard drive, LS-120 drive, or CD-ROM drive (half-height)
❺	Optional hard drive bay (5.25-inch, third-height)

To verify the type, size, and capacity of the mass storage devices installed in the computer, run the View System Information (INSPECT) utility available at computer startup. Refer to Chapter 2, "Compaq Utilities," for more information.

1.4.3   Rear Panel Connectors

Rear panel connectors on your desktop computer are color-coded and include icons to help you identify their functions.
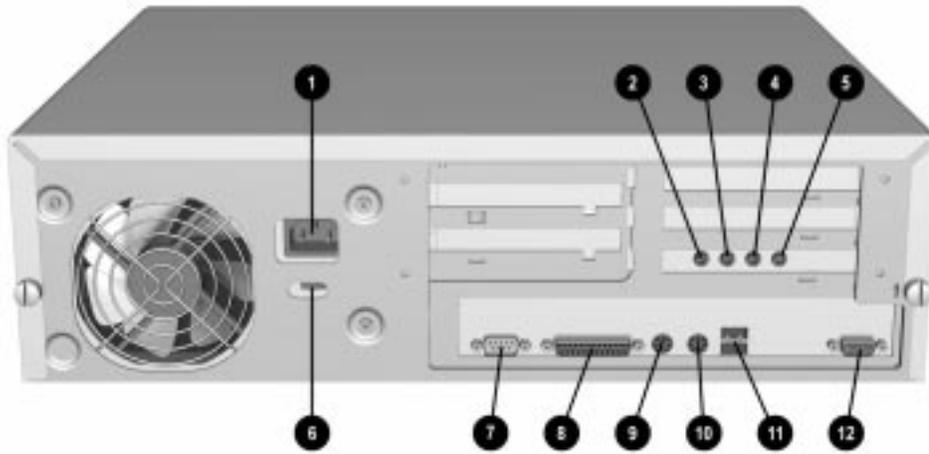
Figure 1-4. *Rear Panel Connectors*

Table 1-5
Rear Panel Connectors

Ref.	Component	Function
❶	Power Cord Connector	Connects the computer to an electrical power outlet.
❷	Microphone Connector*	Connects a microphone for recording sound and voice.
❸	Line-In Audio Connector*	Connects an external audio input device.
❹	Line-Out Audio Connector*	Connects an external audio output device, such as powered speakers, or a cassette tape recorder.
❺	Headphone Connector*	Connects headphones (not suitable for unpowered speakers).
❻	Voltage Select Switch	Switches voltage between 115 V (U.S.) and 230 V to match geographical requirements.
❼	Serial Connector	Connects a serial device, such as a serial printer.
❽	Parallel Connector	Connects a parallel device, such as a parallel printer.
❾	Keyboard Connector	Connects the keyboard.
❿	Mouse Connector	Connects the mouse.
⓫	Universal Serial Bus Connector	Connects the computer to any peripheral while the computer is operating. Is a fully functional Plug and Play connector.
⓬	Monitor Connector	Connects a monitor to an embedded graphics controller.

* Audio features are available on select models only.

1.5 Minitower Computer Features

The Compaq Deskpro 2000 Minitower Personal Computer comes with a mouse and keyboard. Not supplied is a Compaq color monitor or other compatible monitor, which is required to operate your computer.

1.5.1   Front Panel Lights and Controls

***Figure 1-5.** Power Switch and Front Panel Lights*

Table 1-6
Lights and Controls

Ref.	Component	Function
❶	Power Switch	Turns the computer on and off.
❷	Power-On Light	Turns on when the computer is turned on.
❸	Hard Drive Activity Light	Turns on when the hard drive is reading or writing.
❹	Diskette Drive Activity Light	Turns on when the diskette drive is reading or writing.
❺	CD-ROM Headphone Jack*	Connects a headphone to the CD-ROM drive.
❻	CD-ROM Headphone Volume Control*	Increases and decreases the CD-ROM headphone volume.
❼	CD-ROM Drive Activity Light*	Turns on when the CD-ROM drive is reading.
❽	Diskette Eject Button	Ejects a diskette.
❾	CD-ROM Eject Button*	Ejects a CD disc.

* Only available on models with CD-ROM.

1.5.2 Drive Positions

The computer has space available up to five mass storage devices. The devices may be installed in various configurations, including those shown in the table below.
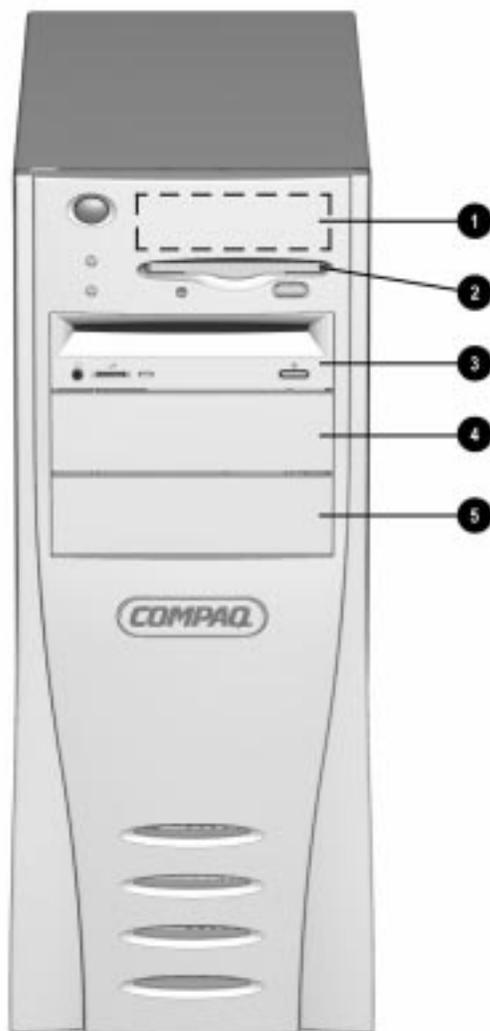
***Figure 1-6.** Drive Positions on the Minitower Computer*

Table 1-7
Compaq Deskpro 2000 Minitower Computer

Drive	Configuration
❶	Primary hard drive bay (3.5-inch, third-height)
❷	Standard 3.5-inch 1.44-MB diskette drive
❸	Optional diskette drive (5.25-inch), tape drive, hard drive, LS-120 drive, or CD-ROM drive (half-height)
❹	Optional diskette drive (5.25-inch), tape drive, hard drive, LS-120 drive, or CD-ROM drive (half-height)
❺	Optional diskette drive (5.25-inch), tape drive, hard drive, LS-120 drive, or CD-ROM drive (half-height)

To verify the type, size, and capacity of the mass storage devices installed in the computer, run Compaq Diagnostics for Windows, or run the View System Information (INSPECT) utility available at computer startup. Refer to Chapter 2, "Compaq Utilities," for more information.

1.5.3 Rear Panel Connectors

The following illustration shows the rear panel connectors of the minitower computer. Each connector includes an icon to help you identify its function.
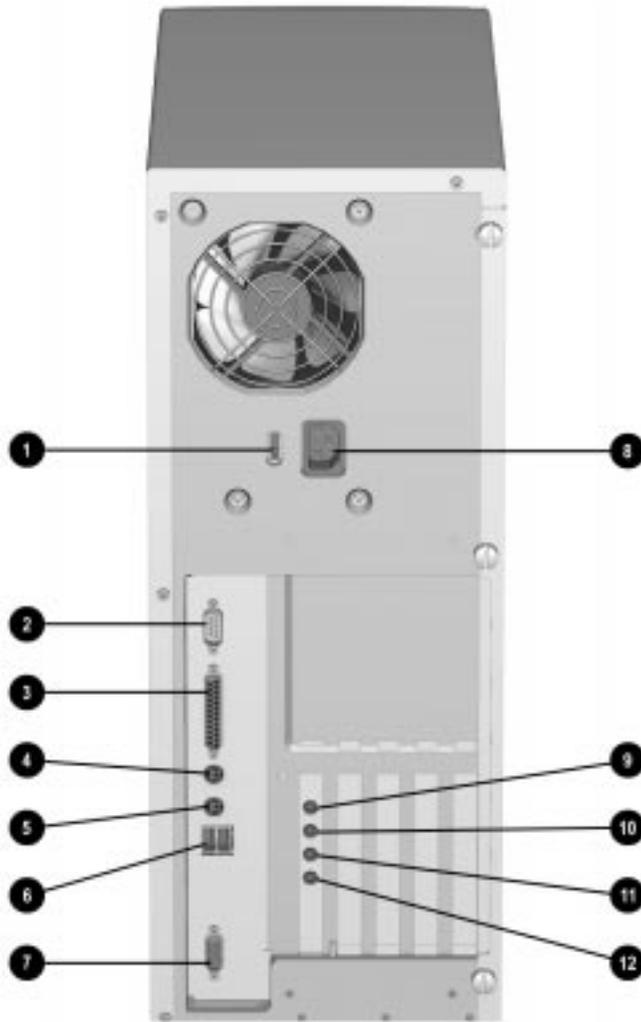
Figure 1-7. *Rear Panel Connectors*

Table 1-8
Rear Panel Connectors

Ref.	Component	Function
❶	Voltage Select Switch	Switches voltage between 115 V (U.S.) and 230 V to meet geographical requirements.
❷	Serial Connector	Connects a serial device, such as a serial printer.
❸	Parallel Connector	Connects a parallel device, such as a parallel printer.
❹	Keyboard Connector	Connects the keyboard.
❺	Mouse Connector	Connects the mouse.
❻	Universal Serial Bus Connector	Connects the computer to any peripheral while the computer is operating. Is a fully functional Plug and Play connector.
❼	Monitor Connector	Connects a monitor to an embedded graphics controller.
❽	Power Cord Connector	Connects the computer to an electrical power outlet.
❾	Microphone Connector*	Connects a microphone for recording sound and voice.
❿	Line-In Audio Connector*	Connects an external audio input device.
⓫	Line-Out Audio Connector*	Connects an external audio output device, such as powered speakers, or a cassette tape recorder.
⓬	Headphone Connector*	Connects headphones (not suitable for unpowered speakers).

* Audio features are available on select models only.

1.6 Enhanced Keyboard

The enhanced keyboard features Windows-specific keys:

✎ Keyboard layout may vary by country.
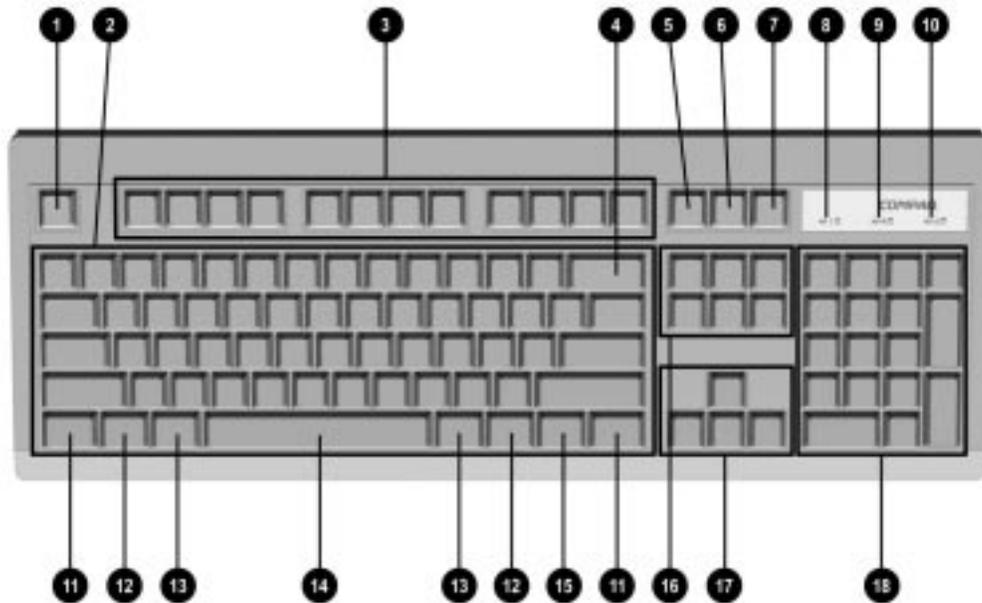
Figure 1-8. *Enhanced Keyboard*

Table 1-9
Keyboard Features and Functions

Ref.	Key	Function
❶	Esc	Often assigned a specific task by the application. Frequently used as an exit key (for quitting an application), for moving back one screen, or for canceling a command.
❷	Main Typewriter Keypad	Provides the same keys in generally the same relative position as a standard typewriter keyboard.
❸	F1 - F12	Used for specific effects in applications and operating systems. Refer to the application software documentation.
❹	Backspace	Moves the cursor left and deletes characters as it moves to the left.
❺	Print Scrn	Depending on the software in use, prints the displayed screen to a printer. Using this key will not necessarily print the entire file.
❻	Scroll Lock	When the Scroll Lock light is on, it prevents the screen from scrolling in some spreadsheet applications.
❼	Pause	Temporarily suspends screen scrolling or some operations.
❽	Num Lock Light	When the Num Lock light is on, the numeric keypad is activated and the arrow keys are deactivated. (The arrow keys to the left of the keypad perform the same functions as the arrow keys on the keypad.)
❾	Caps Lock Light	When the Caps Lock light is on, all letters typed are capitalized.
❿	Scroll Lock Light	When the Scroll Lock light is on, the display will advance a line at a time.
⓫	Ctrl	Used in combination with another key, its effect depends on the software application you are using.
⓬	Windows Logo Keys	Opens the Windows Start menu. Used in combination with another key, its effect depends on the software application you are using.
⓭	Alt	Used in combination with another key, its effect depends on the software application you are using.
⓮	Space Bar	Advances the cursor one character space at a time.
⓯	Windows Application Key	Opens a context menu for the software program you are using.
⓰	Editing Keys	Insert, Delete, Home, End, Page Up, and Page Down. Pressing the key will perform the stated function.
⓱	Arrow Keys	Pressing the left or right arrow keys will move the cursor one character space at a time in the direction shown. Pressing the up or down arrow key will move the cursor up or down one line at a time.
⓲	Numeric Keypad	These keys act as they do on a calculator style keypad.
⓫+⓭+⓰ Ctrl+Alt+Delete		Holding down Ctrl and Alt while pressing Delete restarts the computer.

The keyboard has feet on the bottom that enable the user to tilt the keyboard to a more comfortable typing angle.
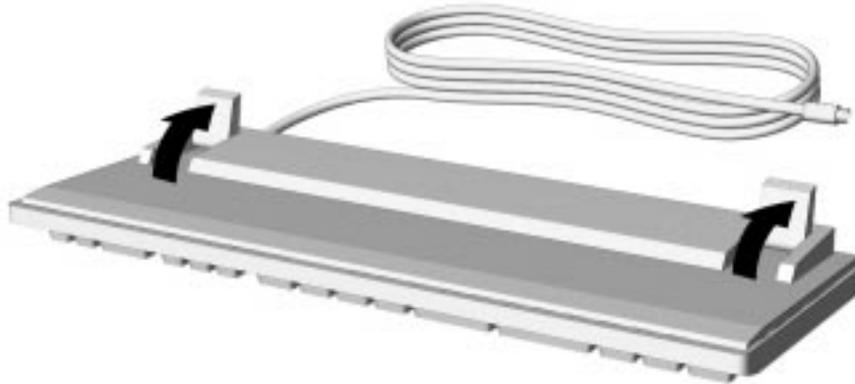
Figure 1-9. *Keyboard Tilt Foot*

1.7 Options

The options that are available from Compaq for the Compaq Deskpro 2000 Series of Personal Computers are described briefly in the following sections.

1.7.1 Cache Upgrade

The L2 cache on the Pentium system may be upgraded from 256 KB to 512 KB by means of an optional cache module. The L2 cache on the Pentium II system configuration is fixed at 512 KB.

1.7.2 System Memory

The system memory may be increased to a maximum of 384-MB SDRAM by the addition of DIMMs to the three DIMM sockets on the system board.

1.7.3 Audio Upgrade

■   Compaq Business Pro Audio ESS 1868

■   Compaq Multimedia Sound System; stereo speakers and microphone for telephony

1.7.4 Mass Storage Options

The following mass storage options are available from Compaq for the Compaq Deskpro 2000 Series of Personal Computers:

■   LS-120 drive: 1.44-/120-MB, 3.5-inch, external and internal third-height. The LS-120 drive will also read/write to 720-KB media.

■   EIDE hard drives: 2.1 GB, 2.4 GB, 3.2 GB, and 4.3 GB

■   Ultra SCSI hard drive: 2.1 GB and 4.3 GB (requires a SCSI controller board)

- Ultra ATA hard drives: 2.1-GB, 3.2-GB, and 4.3-GB

- EIDE CD-ROM drive: 16X Max Speed and 24X Max Speed

- Tape drives: 2/8 GB DAT and 4.0 GB

- SCSI PD-CD drive: 4X speed (requires a SCSI controller board)

- EIDE PD-CD drive: 8X speed

1.7.5   Monitor Options

The following monitor options are available from Compaq for the Compaq Deskpro 2000 Series of Personal Computers:

- Compaq 140 Color Monitor (NA)

- Compaq P50 Color Monitor

- Compaq P70 Color Monitor

- Compaq P110 Trinitron Monitor (NH and SH)

- Compaq V40 Color Monitor

- Compaq V50 Color Monitor (NA, GSA, NH, and SH)

- Compaq V70 Color Monitor (NA, GSA, NH, and SH)

- Compaq V90 Color Monitor

- Compaq TFT500 Flat Panel Display

- Compaq P1610 Color Monitor

1.7.6   Graphics Controllers and Memory Options

Available from Compaq is a 1-MB SGRAM memory upgrade for the Pentium systems or a 2-MB SGRAM memory upgrade for the Pentium II systems.

Also available from Compaq is an optional MPEG1 add-on graphics board. The MPEG1 board allows the user to play MPEG movies and clips with minimal CPU resource usage. Audio for the MPEG1 is also on the option board.

The Millennium II PCI controller board is also available from Compaq.

1.7.7   Serial/Parallel Interface Board

The serial/parallel interface board option is available from Compaq for the Compaq Deskpro 2000 Series of Personal Computers. This board uses an expansion slot and provides additional serial and parallel device support to the computer.

1.7.8 PD-CD Drive

The PD-CD drive is a "two drives in one" device in that it is a rewritable optical drive and a CD-ROM drive. It is a 5.25-inch, half-height, tray-load device that uses phase-change dual technology to simultaneously erase and write on the media at 2X speed and reads at 4X speed. The interface is internal SCSI.

Also available from Compaq is a 8X EIDE PD-CD drive. This device is also a 5.25-inch, half-height, tray-load device that uses phase-change dual technology to simultaneously erase and write on the media. This device, however, writes at 4X speed and reads at 8X speed.

1.7.9 Modems

The following modem options are available from Compaq for the Compaq Deskpro 2000 Series of Personal Computers:

- 33.6-K data/fax modem (NA only)

- 56-K data/fax modem

- ISDN modem

- Compaq Netelligent Corporate Communicator board (NA only)

chapter 2

COMPAQ UTILITIES

This chapter contains descriptions of Compaq utilities that can be helpful when servicing the Compaq Deskpro 2000 Series of Personal Computer. These utilities include:

■ Configuration and Diagnostics

■ ROMPaq

■ Compaq Intelligent Manageability

■ Compaq Insight Manager

■ Prefailure Warranty

See Appendices E, F, and G for error codes, error messages, and other troubleshooting techniques.

The Configuration and Diagnostics utilities are located on a hard disk partition on the computer. These utilities include Create a Diagnostics Diskette, Setup, TEST, and INSPECT.

You can run Configuration and Diagnostics from diskette, or use the *Support Software CD* to install a system partition containing Configuration and Diagnostics utilities.

Use the Compaq Configuration and Diagnostics utilities 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.

2.1 Getting Ready

2.1.1 Preparing the Computer

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

1. Ensure proper ventilation. The computer should have a 3-inch (7.6-cm) clearance at the front and 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 any peripheral devices 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 if you want to use it to log error messages.
4. Create a diagnostic diskette (Section 2.1.2).
5. Run the computer PC Diagnostics diskette.

2.1.2 Create a Diagnostics Diskette

Compaq strongly recommends that you make a backup copy of the diagnostic software. Create a Diagnostics Diskette, described in Section 2.5, is an option from the Compaq Utilities menu. This utility allows you to back up the diagnostics software preinstalled on your hard drive to diskette. This utility is not available in Compaq Diagnostics for Windows.

2.1.3 Accessing the Compaq Utilities Menu

You can access the Configuration and Diagnostics utilities at startup from the Diagnostics Partition on the hard drive or from the diskettes. Procedures for both methods are presented below.

Accessing the Compaq Utilities Menu from the Hard Drive

To access the Compaq Utilities menu at startup from the hard drive, complete the following steps:
1. Turn on or restart the computer. If Windows 95 is running, select Start, Shut Down, Restart the computer.
2. Press F10 when the message "F10 = Setup" displays in the lower-right corner of the screen.

   ✎ If you do not press the F10 key while the message is displayed, you must reboot the computer to access the utility.

3. If prompted, select the desired language.
4. Press Enter at the Welcome to Compaq Utilities screen.
5. The Compaq Utilities menu appears. The Compaq Utilities menu offers the options shown below. Use the Arrow keys to highlight the desired menu item and then press the Enter key to select the item. You are prompted through any procedure that you select.

   ❑ Computer Setup

   ❑ Computer Checkup (TEST)

   ❑ View System Information (INSPECT)

   ❑ Create a Diagnostics Diskette (this option requires three diskettes)

   ❑ Manage a Diagnostics Partition (only available when booting from diskette)

   ❑ Exit

Accessing the Compaq Utilities Menu from a Diskette

You can load either the Computer Setup or Diagnostics Utilities by completing the following steps:

1. Insert the Diagnostics diskette into drive A.
2. Turn on or restart the computer. If Windows 95 is running, select Start, Shut Down, Restart the computer.
3. If prompted, select the desired language.
4. Press Enter at the Welcome to Compaq Utilities screen.
5. The Compaq Utilities menu listing is displayed. Use the arrow keys or the mouse to highlight the desired menu item and then press the Enter key to select the item. You are prompted through any procedure that you select.

   ❏ Computer Setup

   ❏ Computer Checkup (TEST)

   ❏ View System Information (INSPECT)

   ❏ Create a Diagnostics Diskette

   ❏ Manage a Diagnostics Partition

   ❏ Exit

   If you select Computer Setup from this menu, you are prompted to insert the Setup diskette. You are prompted through any procedure that you select.

2.2 Computer Setup

Computer Setup is used to configure Compaq computers and is selected from the Compaq Utilities menu. It is preinstalled on the hard drive and is also available on diskette. Setup gives a snapshot of the computer's hardware configuration, aids in troubleshooting, and allows you to set custom features. Computer Setup recognizes a newly installed internal or external device and automatically updates the Computer Setup screen.

To run Setup, complete the following steps:

1. From the Compaq Utilities menu, select the Computer Setup option.

   A Setup screen is displayed. It may take a few minutes for the computer to generate this information.

   The screen lists the hardware that is configurable in the configuration memory and that is currently used by the system with the exception of a tape drive. Alongside each option is a summary of the current configuration.

   You may display or reconfigure any of the detailed information provided.

2. Use the arrow keys or the mouse to highlight menu items, the Tab key to select buttons, and the Enter key to select the desired items.

3. After making the desired change, select OK to save the change and return to the Computer Setup menu.

The Computer Setup screen includes two buttons: Built-In Devices and Add-In Devices. The following tables list the options available under each of the two buttons:

Table 2-1
Built-In Devices

Sub-Menu Button	Configuration Option	Sub-Menu Button	Configuration Option
Video	Driver and Resolution	System Information	Processor
Storage	Diskette Drive		System Parameters
	Removable Media		Bus Priority
	IDE Devices		Quick Boot
	SCSI Devices		POST Messages
	Boot Order		Date/Time
Input devices	Keyboard	Communications	Serial Ports
	Mouse		Parallel Port
	Game Port	Power Management	Energy Save
Security Management	Power-On Password		
	Setup Password		
	USB		

Quick Boot

Quick Boot allows a faster boot cycle than does Full Boot. Quick Boot, however, does not run all the diagnostic test that run during Full Boot. Quick Boot can be enabled to:

1. Always Quick Boot (default).
2. Periodically Full Boot (from every 1 to 31 days).
3. Always Full Boot.

Passive Release (Pentium II System)

Version 2.1 of the PCI specification sets limits on the maximum time allowed for a device to complete transactions on the PCI bus. Passive release addresses the time limits set by the specification. Passive release is a feature of the Pentium II systems only.

With passive release enabled, slower ISA devices are made to wait until faster PCI devices have completed their transactions. Disabling passive release gives ISA devices priority over PCI devices. The units ship with passive release enabled. To enable or disable passive release, use the following steps:

1. Run Computer Setup (Section 2.2).
2. Under System Information, select the Processor icon.
3. Find "Bus Priority."
4. Select ISA or PCI.

✎ Selecting ISA disables passive release, giving ISA devices priority. Selecting PCI enables passive release, giving PCI devices priority.

Table 2-2
Add-In Devices

Sub-Menu Button	Description or Function
ISA Boards	Lists installed ISA boards.
	Allows you to Add or Remove boards and to View or Edit board information.
PCI Boards	Lists installed PCI boards.
	Allows you to View or Edit board information.

2.2.1 Security Features

Table 2-3
Built-In Devices Security Features

Configuration Option	Description or Function
Power-On Password	Allows you to enable power-on password.
	Allows you to specify prompting for power-on password.
	Allows you to enable Network Server Mode, which allows for restarting of computer from hard drive or network when the keyboard is disabled.
	Allows you to enable QuickLock/QuickBlank.
	(To maintain the security of QuickLock/QuickBlank, you must also disable the USB ports.)
Setup Password	Allows you to enable Setup (administrator) password, controlling access to the computer.
USB	Allows you to disable USB ports.

Table 2-4
Built-In Devices Communications

Configuration Option	Description or Function
Serial Ports	Lists available serial ports and settings.
	Allows you to disable serial ports by selecting Disable from the resources list.
Parallel Port	Lists available parallel port and settings.
	Allows you to disable serial ports by selecting Disable from the resources list.

Establishing a Password in Windows 95

To establish a password in Windows 95, complete the following steps:

1. Click the My Computer icon.
2. Click the Control Panel folder.
3. Double-click the Passwords icon and follow the instructions to set a new password.

Establishing a Power-On Password Using Computer Setup

Establishing a power-on password through Computer Setup prevents access to the computer when power is turned on, unless the password is entered. The password must be entered each time the computer is turned on, when the key icon (⌐) appears on the monitor. To establish a power-on password through Computer Setup, complete the following steps:

1. Turn on the computer.
2. When the message "F10 = Setup" appears in the lower-right corner of the screen, press F10.

   ✎ The message displays in the lower-right corner of the screen for approximately two seconds. If you do not press F10 during this time, you must reboot the computer to access the utility.

3. Press Enter to bypass the welcome screens and display the main menu.
4. From the main menu, select Computer Setup, and press Enter.
5. Select Built-In Devices, then select the Security Management feature.
6. Locate the power-on password option and follow the instructions provided to enable it.
7. Save the configuration and exit the utility.

Entering a Power-On Password

To enter the power-on password, complete the following steps:

1. Turn on the computer.
2. When the key icon (⌐) appears on the monitor, enter your current password.

   ✎ Type carefully; for security reasons, the characters you type do not appear on the screen.

If you enter the password incorrectly, a broken key icon (⌐) appears. Try again. After three unsuccessful tries, you must turn off the computer, then turn it on again before you can continue.

Changing a Power-On Password

To change the password, complete the following steps:

1. Turn on the computer.
2. When the key icon (⌐) appears, type your current password, a slash (/) or alternate delimiter character, your new password, another slash (/) or alternate delimiter character, and your new password again as shown:

   current password/new password/new password

   ✎ Refer to Table 2-5, "National Keyboard Delimiter Characters," for information about the alternate delimiter characters.

   For security reasons, the characters you type do not appear on the screen.

Completing this procedure causes the new password to take effect the next time you turn on the computer.

Deleting a Power-On Password

To delete the password, complete the following steps:

1. Turn on the computer.
2. When the key icon (⌐) appears, type your current password followed by a slash (/) or alternate delimiter character as shown:

   current password/

   ✎ Refer to Table 2-5, "National Keyboard Delimiter Characters," for information about alternate delimiter characters.

Completing this procedure deletes the password until you establish a new one through Security Management.

National Keyboard Delimiter Characters

Each keyboard is designed to meet country-specific requirements. The syntax and keys that you use for changing or deleting your password depend on the keyboard that came with your computer.

To determine the delimiter key required for changing or deleting your password, find your keyboard in the table below:

Table 2-5
National Keyboard Delimiter Characters

Arabic	/	Greek	-	Slovakian	-
Belgian	=	Hungarian	-	Spanish	-
BHCSY*	-	Italian	-	Swedish/Finnish	/
Brazilian	/	Japanese	/	Swiss	-
Chinese	/	Korean	/	Taiwanese	/
Czech	-	Latin American	-	Thai	/
Danish	-	Norwegian	-	Turkish	.
French	!	Polish	-	U.K. English	/
French Canadian	é	Portuguese	-	U.S. English	/
German	-	Russian	/		

* For Bosnia-Herzegovina, Croatia, Slovenia, and Yugoslavia

Clearing the Password

If you do not know the power-on password, you may both clear and disable it by moving the jumper on the password header located on the system board. The password header is labeled "E6 Password" on the Pentium system board and labeled "Password" on the Pentium II system board.

The password header has three pins. The power-on password comes enabled by default with the jumper on pins 5 and 6. To clear or disable the power-on password, move the jumper to pins 6 and 7.
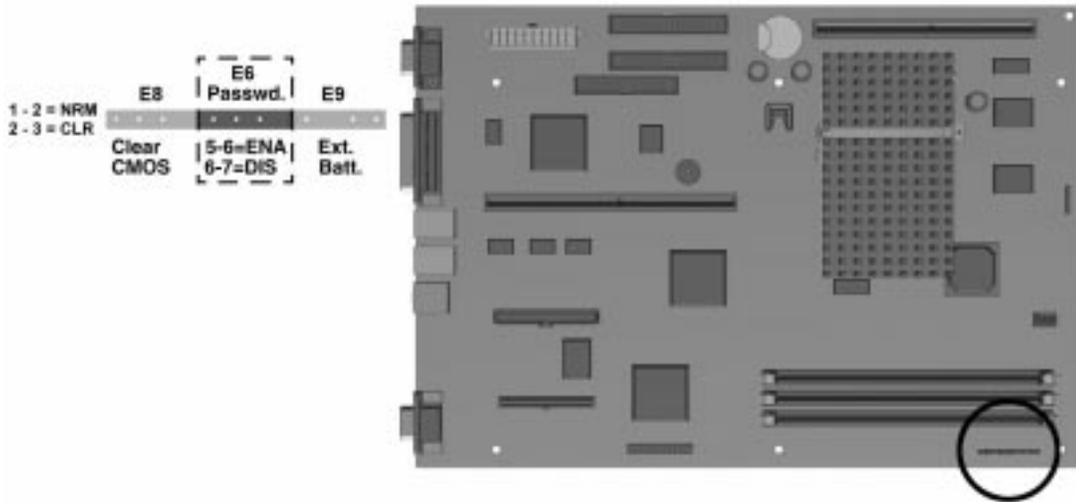
Figure 2-1. *Locating the Password Header on the Pentium System Board*
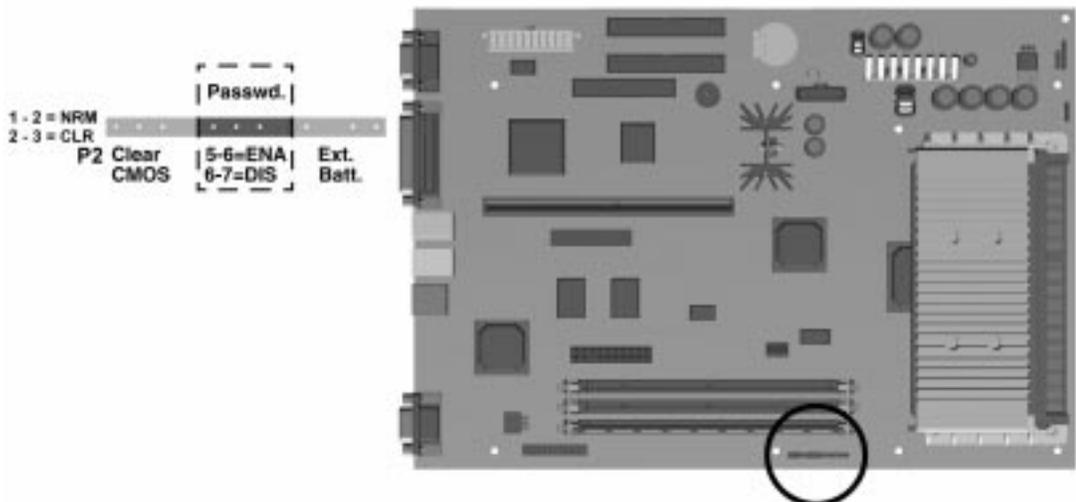
Figure 2-2. *Locating the Password Header on the Pentium II System Board*

2.2.2 QuickLock/QuickBlank

The QuickLock and QuickBlank features can disable the keyboard and mouse interfaces and blank the screen while an application is open. QuickLock is enabled with a power-on password. If QuickBlank is also enabled, the screen blanks. When this feature is used, the computer is secure until you enter the power-on password.

QuickLock and QuickBlank are enabled through Security Management. The keyboard and mouse interface can be disabled and the screen blanked from within any application. Entering a QuickLock key combination (Ctrl+Alt+L) disables the keyboard and the mouse interface. If QuickBlank is not activated, the application remains in view on the screen, but it cannot be accessed.

To enable the QuickLock and QuickBlank features from the Configuration and Diagnostics Menu, complete the following steps:

1. Turn on the computer.
2. When the message appears in the lower-right corner of the screen, press F10.

   ✎ The message displays in the lower-right corner of the screen for approximately two seconds. If you do not press F10 during this time, reboot the computer to access the utility.

3. Press Enter to bypass the welcome screens and display the main menu.
4. From the main menu, select Computer Setup and press Enter.
5. Select Built-In Devices and press Enter.
6. Select the Security Management feature, and press Enter.
7. When the steps in the Security Management screen display, select Enable QuickLock of the Keyboard.
8. Select QuickLock and/or QuickBlank.
9. Select OK to save the configuration.
10. On the Main screen, select Save and exit from the File menu.

To make use of the keyboard and mouse interface, see the information that follows.

Once in an application, enter the QuickLock key combination (Ctrl+Alt+L). The keyboard and mouse (or other input device connected to the mouse connector) are disabled. The application cannot be accessed at this time but remains in view unless the QuickBlank feature was also enabled through the Configuration utility.

To enable the keyboard and input device connected to the mouse connector, enter the password.

   ✎ For security reasons, the characters you type do not appear on the screen. The application will not be affected by the characters typed.

2.3 Computer Checkup (TEST)

Computer Checkup (TEST), the primary diagnostics utility, confirms whether the various computer devices are recognized by the system and are functioning properly. Use the TEST utility to help set up tests and to test the computer. You may also use TEST in the following instances:

■ To determine if all devices are recognized by the system and functioning properly. Running TEST is optional, but recommended, after you install or connect a new device.

■ To save, print, or display the information generated by TEST. It is recommended that you run TEST and have the printed report available before placing a call to the Compaq Customer Support Center.

■ To assist your Compaq authorized dealer, reseller, or service provider in analyzing the system by allowing the service provider to reproduce the same environment on another computer for testing.

To run Computer Checkup (TEST), complete the following steps:

1. Turn on only the external devices that you wish to test. You may wish to leave the printer connected to log error messages.
2. Access the Compaq Utilities menu.
3. From the Compaq Utilities menu, select Computer Checkup (TEST).
4. When the test option menu appears, select the option to view the device list.
5. Verify that TEST correctly detected the devices installed.

✎ This utility will detect all devices manufactured by Compaq; devices from other manufacturers may not be detected.

❑ If the list is correct, select OK and go on to step 6.
❑ If the list is incorrect, be sure that any new devices are installed properly. If you do not find an installation problem, call your Compaq authorized dealer, reseller, or service provider.

6. Select one of the following from the test option menu:

❑ **Quick Check Diagnostics**—This option 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**—This option 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**—This option 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.

7. Follow the instructions on the screen as the diagnostic tests are run on the devices. When the testing is complete, the screen displays the test option menu again.

✎ When running TEST, record any error message numbers and have them available when you contact your Compaq authorized dealer, reseller, or service provider for assistance.

8. Exit to the Compaq Utilities menu.

2.4 View System Information (INSPECT)

Use View System Information (INSPECT) in the following instances:

■ To view information about the system once it has been configured.

■ To save, print, or display the information generated by INSPECT. It is recommended that you run INSPECT and have the printed report available before placing a call to the Compaq Customer Support Center.

■ To assist your Compaq authorized dealer, reseller, or service provider in analyzing the system by allowing the service provider to reproduce the same environment on another computer for testing.

INSPECT provides the following information about the system's operating environment:

■ Contents of the operating system startup files

■ Current memory configuration

■ ROM versions

■ Type of processor and coprocessor

■ Types of drives installed

■ Active printer and communications interfaces

■ Type of modem installed

■ Graphics details

■ Windows *WIN.INI* file details

■ Keyboard

■ Windows files

■ Network status

To run INSPECT, complete the following steps:

1. From the Configuration and Diagnostics menu, select the View System Information (INSPECT) option.

    After the hardware configuration has been identified, the INSPECT menu appears.

2. Use the arrow keys to select the desired option listed below.

    ❏ Print the INSPECT status.
    ❏ Save the INSPECT status to a file.
    ❏ Add comments to a parameter status.
    ❏ Exit the utility.

3. When the print or save menu appears, use the arrow keys to move within the menus and select the desired items using the space bar.

   Follow the screen prompts to print or save the information.

4. When the Add Comments menu appears, type in the desired information and follow the screen prompts.

5. You may view detailed information about any of the devices by using the cursor to highlight any device and pressing ENTER.

6. Follow the screen prompts to exit the utility.

2.5 Create a Diagnostics Diskette

This option from the Compaq Utilities menu will allow you to create a set of diagnostics and setup diskettes from the software preinstalled on the hard drive. Three diskettes are required for this option: two for Setup and one for Diagnostics.

To create the Diagnostics and Setup diskettes, perform the following steps:

1. From the Compaq Utilities Menu, select the Create a Diagnostic Diskette option.

   A message screen appears with information about labeling the required diskettes.

2. Label the diskettes and select OK.

3. Follow the screen prompts for changing the diskettes.

After creating the diskettes, follow the screen prompts to exit the application.

2.6 Managing the Diagnostics Partition

This option allows you to create, delete, or upgrade the Diagnostics software on your computer. This must be performed from a Diagnostics diskette.

A Diagnostics Partition is installed on the primary hard drive at the factory. If the installation is to be made on a newly installed primary hard drive, it must be done before DOS is installed to make it bootable during POST.

To perform any diagnostic partition activity, complete the following steps:

1. Insert the Compaq Diagnostics diskette into the diskette drive.

2. Reboot the computer (Ctrl+Alt+Del), or turn the power off and then on. At this point, the Language Screen appears, listing the languages on the diskette.

3. Select the desired language. The Welcome screen then appears.

4. Follow the screen instructions to get the Configuration and Diagnostics menu.

5. Select the Manage Diagnostics Partition from the menu.

   The screen will present the Manage Diagnostics Partition menu.

6. Select the desired partition activity (Create, Upgrade, or Delete) and follow the screen prompts to complete the tasks.

⚠ **CAUTION:** Creating a Diagnostics Partition involves performing a low-level format on the hard drive. This is normally only done to add diagnostics to a new replacement hard drive. If the diagnostics software is deleted, you will no longer be able to access the Compaq Utilities menu.

2.7 Exiting the Compaq Utilities Menu

To exit the Compaq Utilities menu, select the Exit option or press Ctrl+Alt+Delete. Either option restarts the computer and saves any changes you've made.

2.8 Compaq Enhanced Insight Personal Edition (Diagnostics for Windows)

Compaq Enhanced Insight Personal Edition (Compaq Diagnostics for Windows) utility contains the same functionality as the partition-based INSPECT program but in a Windows environment. To use the Compaq Diagnostics for Windows utility in Windows 95, select the Compaq Diagnostics icon from the Control Panel.

Once the program is running, you can use the tool bar or the menus to browse through the information. Some examples of the information you can view are:

■ Product name

■ CPU information

■ Cache size and type

■ Mouse driver versions

■ COM ports, LPT ports, modems

■ ISA and PCI slot information

■ Version of certain software

■ ROM version

■ Storage information

■ Power Management settings

■ Multimedia devices information

2.9 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 functioning properly:

■ Keyboard

■ System board

■ Memory modules

■ Video

■ Diskette drives

■ Hard drives

■ Power supply

■ Controllers

If POST finds an error in the system, an error condition is indicated by an audible and/or visual message. Refer to Appendix F for POST error messages and recommended courses of action.

2.10 ROMPaq

The Compaq Deskpro 2000 Series of Personal Computer comes with reprogrammable Flash ROM (Read Only Memory). Flash ROM Lock, set to its default setting of OFF, protects the Flash ROM from being upgraded and the system BIOS from being updated.

To update the ROM, order the ROMPaq diskette from Compaq. Then complete the following procedures:

1. Insert the ROMPaq diskette into the diskette drive.

2. Turn on the computer.

△ **CAUTION:** If the computer does not have a Setup Password enabled, then the ROM is not write-protected and unauthorized updates can occur. The Setup Password is disabled when the computer is shipped from the factory.

3. If prompted, enter the Setup Password.

4. If the Setup Password is entered correctly, the ROMPaq utility takes over and runs the Flash ROM upgrade.

✎ If the Setup Password is entered incorrectly, the procedure terminates and no changes are made to the ROM.

△ **CAUTION:** Do not turn the power off during a firmware upgrade. A loss of power during upgrade might corrupt the upgrade.

5. When the utility has finished upgrading the ROM, remove the diskette from the diskette drive and reboot the computer.

2.11 Compaq Intelligent Manageability

Intelligent Manageability combines innovative hardware technology with PC LAN management tools from Compaq and other leading vendors to make Compaq desktop and portable computers easier to inventory, troubleshoot, protect, and maintain. Intelligent Manageability features focus on:

■ Asset Management

■ Fault Management

■ Security Management

■ Configuration Management

■ Integration Management

2.11.1 Asset Management

Conducting a physical inventory of personal computers, key components, and monitors can be time-consuming and costly. The Compaq Deskpro Asset Management solution to this problem begins with AssetControl, hardware designed and built into new Compaq personal computers, key components, and monitors that support the VESA DDC2B, DIMM SPD, and EDID standards.

AssetControl features make it easy and inexpensive to maintain an accurate, up-to-date inventory. AssetControl features:

■ Provide detailed inventory information about various components, including:

❑ Manufacturer, model, and serial number of Compaq computers, monitors, hard drives, and dual inline memory modules (DIMMs)

❑ Asset Tag

❑ System board and ROM revision level

❑ DMI BIOS

■ Allow you to view, print, or electronically save this data, and other system configuration details, using:

❑ Enhanced Compaq Insight Personal Edition

❑ Compaq Insight Manager

❑ PC LAN management products from the Compaq Desktop Management Solutions Partners

❑ Management software products supporting the Desktop Management Interface Revision 2.0 (DMI 2.0)

■ Simplify and help ensure the accuracy of inventory and accounting procedures

■ Streamline service calls by giving the administrator fast access to the Compaq personal computer configuration and history

■ Simplify remote software distribution procedures by allowing the system administrator to identify software and revision levels remotely

2.11.2 Fault Management

Fault Management features combine innovative hardware and software technology to prevent the loss of critical data and minimize unplanned downtime.

When a fault occurs, the computer displays a Local Alert message containing a description of the fault and any recommended actions. You can then view current system health by using Compaq Insight Personal Edition. If the computer is connected to a network managed by Compaq Insight Manager or other simple network management protocol (SNMP)–based management products (e.g., HP OpenView or IBM Tivoli TME10 NetView), the computer also sends a fault notice to the network management application.

SMART II Hard Drive Fault Prediction

The SMART II hard drive monitors hard drive activity to predict failures before they occur. Fault prediction and failure indication parameters, such as abnormal variations in spinup and seek times, or non-correctable read and write errors, are tracked to determine the hard drive condition. Should these errors become significant, the computer displays a warning message. The warning gives you time to back up the hard drive and replace it prior to experiencing downtime or loss of data. The Prefailure Warranty for SMART II hard drives allows you to replace these drives, free of charge, before the drives fail.

SMART II hard drives are compliant with the Small Form Factor Committee Specification for Self-Monitoring, Analysis, and Reporting Technology (SMART) Version II. SMART is the industry standard technology, pioneered by Compaq and originally called IntelliSafe, that allows you to prevent data loss and minimize downtime, in concert with Compaq Insight Management Agents.

ECC Fault Prediction and Prefailure Warranty

When the computer encounters an excessive number of error checking and correcting (ECC) memory errors, the screen displays a Local Alert message. This message contains detailed information about the errant memory module, allowing you to take action before you experience non-correctable memory errors. The Prefailure Warranty for ECC memory modules allows you to replace these modules, free of charge, before the modules actually fail. ECC memory modules are optional on all Compaq Deskpro personal computers.

✎ To use this feature, you must replace the standard DIMMs with ECC DIMMs.

Monitor Fault Diagnosis

New Compaq monitors detect when the operating temperature exceeds the normal range or when a hardware fault occurs. Hardware faults may include the following:

■ Power voltage out of range

■ Power current out of range

■ Horizontal deflection

■ Vertical deflection

■ I/O controller operation failure

If the monitor detects one of these conditions, the computer will send an alert over the network to the system administrator.

Proactive Backup

Proactive Backup software initiates a tape or PD-CD backup upon receiving notice of an impending SMART hard drive failure.

The Seagate Backup Exec SMART Client works with Seagate Backup Exec tape backup software on the server, or with Seagate Backup Exec software supporting the PD-CD drive. Together with the Insight Management Agents, this software offers a Proactive Backup solution. For instructions on configuring the Backup Exec SMART Client, contact your systems administrator or refer to the Seagate Backup Exec documentation.

Cheyenne has also created an agent to support the Proactive Backup solution. The SMART Drive Agent is the component that recognizes and reacts to the SMART II hard drive fault alerts. This agent is an extension to the Microsoft Windows 95 tape backup agent for the standalone application ARCsolo for Windows. This agent works with the SMART II hard drive to ensure that critical data will be protected in the event of a hard drive failure.

Surge-Tolerant Power Supply

An integrated, surge-tolerant power supply provides greater reliability when the computer is hit with an unpredictable power surge. This power supply is rated to withstand a power surge of up to 2,000 volts without incurring any system downtime or data loss.

2.11.3 Security Management

As access to a network increases, so does the risk of unauthorized access to critical information and theft of valuable components. The Compaq personal computer provides a robust set of security features to protect the computer and data from unauthorized access.

■ Physical security features such as the cable lock provision help prevent theft or unauthorized access to internal components such as processor and memory.

■ Setup and Power-On Passwords help prevent unauthorized access to information stored on the computer or the network.

■ DIMM configuration changes will trigger local and remote alert messages, providing timely notice of unauthorized additions, changes, or removals. (This feature is supported on all Compaq DIMMs and others that comply with the DIMM SPD standard.)

■ The Ownership Tag displays ownership information during system restart. The Ownership Tag information can be entered or modified in Computer Setup and is protected by the Setup Password.

■ Drive and media security features control access to the information stored on the computer and can prevent unauthorized transfer of data to a diskette drive or other removable storage media (e.g. LS-120, PD-CD). These features can also prevent startup from the removable media drives.

■ Device disabling features can prevent unauthorized transfer of data over fax/modems, serial ports, parallel ports, or infrared ports.

■ QuickLock and QuickBlank can be set to lock the keyboard and/or blank the monitor screen when the PC goes into low power mode.

Security management settings can be viewed locally using Compaq Insight Personal Edition or remotely using Compaq Insight Manager.

2.11.4 Configuration Management

Configuration Management features include:

■ Remote ROM Flash

■ FailSafe Boot Block ROM

■ Remote Security Management

■ Replicated Setup

■ Power Management

■ Compaq Integrated Software

■ Universal Driver Manager

■ Enhanced Support Software CD and World Wide Web Site

✎ Use of remote Configuration Management features requires an established Setup Password.

Remote ROM Flash

Your computer comes with reprogrammable flash ROM (Read Only Memory). By establishing a Setup Password in Security Management, you can protect the ROM from being unintentionally updated or overwritten. This is important to ensure computer operating integrity. Should you need or want to upgrade your ROM, you may:

■ Order an upgraded ROMPaq diskette from Compaq.

■ Order the *Support Software CD for Compaq Desktop, Portable, and Workstation Products.*

■ Download the latest ROMPaq images from the Compaq World Wide Web site (www.compaq.com).

⚠ **CAUTION:** For maximum ROM protection, be sure to establish a Setup Password. The Setup Password prevents unauthorized ROM upgrades.

Upgrading Flash ROM

To upgrade the ROM after you receive an upgraded ROMPaq diskette, complete the following steps:

1. Insert the ROMPaq diskette in the diskette drive, enter the correct command, and the computer will prompt for the Setup Password.
2. Enter the Setup Password.
3. If the Setup Password is entered correctly, the ROMPaq utility will take over and run the flash ROM upgrade.

✎ Do not turn off the power to your computer until the ROMPaq utility has completed the upgrade process.

If the Setup Password is incorrectly entered, the procedure will terminate and no changes will be made to the ROM.

4. When the utility finishes upgrading the ROM, remove the diskette from the diskette drive and restart your computer.

Using Remote ROM Flash

Remote ROM Flash allows the system administrator to safely upgrade the ROM on remote Compaq Deskpro personal computers, directly from the centralized network management console. Enabling the system administrator to perform this task remotely, on multiple computers, results in a consistent deployment of and greater control over Deskpro ROM images over the network. It also results in greater productivity and lower total cost of ownership.

Compaq created the Remote ROM Flash capability to be secure and fail-safe. All Deskpro ROMPaq ROM images from Compaq are digitally signed to ensure authenticity and minimize potential corruption. The ROM firmware includes a Boot Block that is protected during the flash process and allows the Deskpro to be restarted, in the unlikely event of an unsuccessful ROM flash.

Remote ROM Flash is performed in two stages:

1. System administrator uses the Remote Management Setup software on a centralized management console to prepare a Deskpro ROMPaq file.
2. System administrator uses a PC LAN management product, such as Microsoft SMS, Intel LANDesk Manager, or Symantec Norton Administrator for Networks, to distribute and execute the file over the network to remote Deskpros.

✎ Use of Remote ROM Flash requires an established Setup Password.

For more information on enabling Remote ROM Flash, refer to the online *Remote Management Help.*

FailSafe Boot Block ROM

The FailSafe Boot Block ROM allows for system recovery in the unlikely event of a ROM flash failure, for example, if a power failure occurs during a ROM upgrade. The Boot Block is a flash-protected section of the ROM that checks to validate the system ROM each time power to the system is turned on.

■   If the system ROM is valid, the system starts normally.

■   If the system ROM fails the validation check, the FailSafe Boot Block ROM provides enough support to start the system from a ROMPaq diskette, which will program the system ROM with a valid image.

Because there is no video or hard drive support from the Boot Block ROM, the keyboard lights communicate information. When the Boot Block detects an invalid system ROM, the system sounds a series of beeps (one long and three short) and flashes the three keyboard lights.

To recover the system after hearing the FailSafe Boot Block beeps, complete the following steps:

1. Remove any diskettes from the diskette drive and turn off the power.
2. Insert a ROMPaq diskette into the diskette drive.
3. Turn on power to the system

   If a Setup Password has been established, the Caps Lock light will turn on.
4. Enter the Setup Password.

   When the system successfully starts from the diskette and reprograms the ROM, the three keyboard lights will turn on.

The following table lists the various keyboard light combinations, as well as the meaning and action associated with each combination.

Table 2-6
Keyboard Light Combinations

Num Lock ❶	Caps Lock ❷	Scroll Lock ❸	Meaning and Required Action
OFF	ON	OFF	System requires Setup Password. Enter the Setup Password. The light remains turned on until you enter a valid Setup Password.
ON	OFF	OFF	System could not start from diskette because the ROMPaq diskette is not present, is bad, or the drive is not ready. Insert a valid ROMPaq diskette, turn the power off, then turn the power on.
OFF	OFF	ON	ROM upgrade failed. Try another ROMPaq diskette. If the light remains turned on, contact Compaq customer support.
ON	ON	ON	ROM upgrade successfully completed. Turn power off and back on to resume normal system operation.
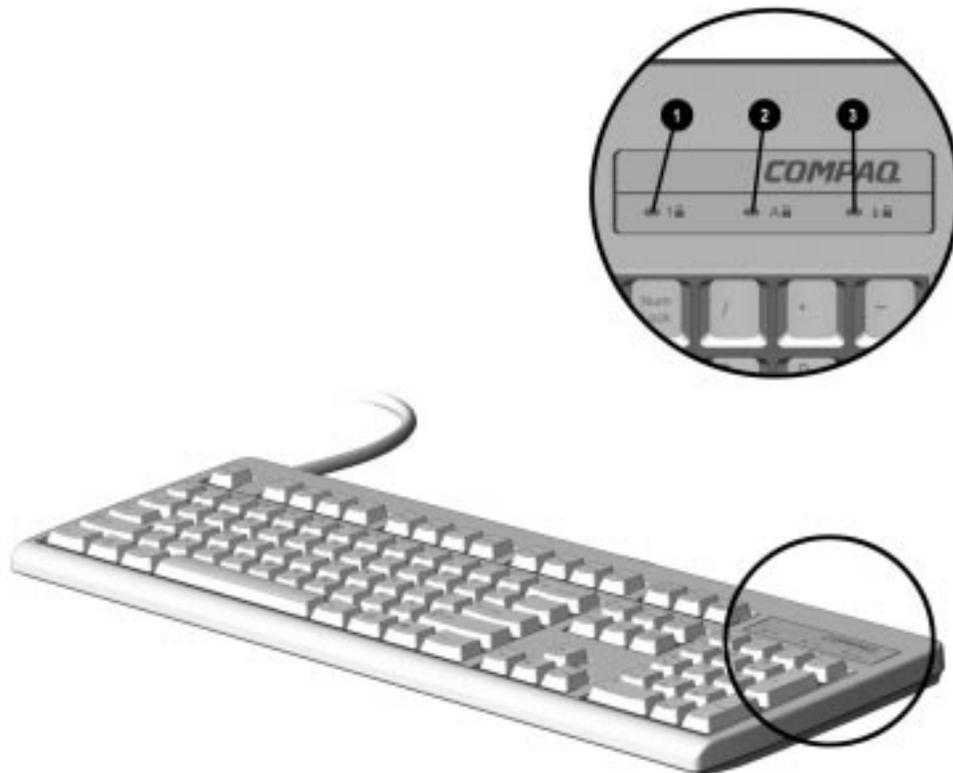
Figure 2-3. *Keyboard Lights*

Remote Security Management

Remote Security Management allows the system administrator to safely set or modify security features on remote Compaq Deskpros, directly from the centralized network management console. Enabling the system administrator to perform these tasks remotely, on multiple computers, results in consistent deployment of and greater control over Deskpro security parameters over the network. It also results in greater productivity and lower total cost of ownership.

✎ Use of Remote Security Management requires an established Setup Password.

Remote Security Management is performed in two stages:

1. System administrator uses the Remote Management Setup software on a centralized management console to define the security parameters.
2. System administrator uses a PC LAN management product to distribute the settings over the network to remote Compaq Deskpro personal computers.

For more information on enabling Remote Security Management, refer to the online *Remote Management Administrator's Guide.*

Replicated Setup

The Replicated Setup feature gives an administrator the ability to easily copy one Deskpro Setup configuration to other Deskpro computers of the same model. This allows for faster, more consistent configuration of multiple Deskpro computers.

Using Replicated Setup

To use Replicated Setup in Computer Setup, complete the following steps:

1. Access Computer Setup from the Compaq Utilities menu.
2. Use Computer Setup to select the settings for the Replicated Setup.
3. Select File, Save System Configuration from the menu bar, and follow the instructions on the screen.
4. To restore the Replicated Setup, select File, Restore System Configuration from the menu bar, and follow the instructions on the screen.

For help on specific features provided by the Computer Setup, click Help.

Power Management

Use Computer Setup, accessible through the Compaq Utilities menu, to establish, modify, or disable Power Management features.

✎ Disable monitor timeouts in Computer Setup first, then establish the settings in Windows 95, to avoid potential conflicts.

Use Display Properties to establish, modify, or disable Power Management settings for the monitor. To access Display Properties, right-click on the Windows Desktop, then choose Properties.

Compaq Integrated Software

Additional support software is available on the *Support Software CD for Compaq Desktop, Portable, and Workstation Products* and the Compaq World Wide Web site (www.compaq.com). This software supplements the installation of off-the-shelf Microsoft operating systems and lets you quickly and easily install the correct Deskpro device drivers and other software required for top performance.

Universal Driver Manager

Compaq has created a Universal Driver Manager (UDM) release that supports all Compaq QVision, S3, Cirrus Logic, and Matrox graphics adapters found on Compaq Deskpro products. The UDM eases graphics driver deployment across all Compaq Deskpro platforms ensuring cross-compatibility and backward-compatibility. The resulting solution enables customers to manage and control ongoing software maintenance costs. The UDM is available on the *Support Software CD for Compaq Desktop, Portable, and Workstation Products* and the Compaq World Wide Web site (www.compaq.com).

Enhanced Support Software CD and World Wide Web Site

Compaq engineers rigorously test and debug software developed by Compaq and third-party suppliers, and develop operating-system specific support software, to ensure the highest level of performance, compatibility, and reliability for Compaq personal computers.

When making the transition to new or revised operating systems, it is important to implement the support software designed for that operating system. If you plan to run any of the following operating systems on your computer, you must install corresponding Compaq device drivers and utilities to ensure all features are supported and functioning properly:

■ Microsoft Windows 3.1

■ IBM OS/2

■ Microsoft Windows NT Workstation 3.51 or 4.0

■ A version of Microsoft Windows 95 that is different from the version included with your computer

Compaq has made the task of locating, accessing, evaluating, and installing the latest support software easier. There are three methods you can use to access support software:

■ You can order the *Support Software CD for Compaq Desktop, Portable, and Workstation Products.* This compact disc contains the latest device drivers, utilities, and flashable ROM images needed to run MS-DOS, Microsoft Windows 3.1, Windows 95, Windows NT Workstation, and IBM OS/2 on your Compaq commercial desktop product.

■ You can download the software from the Compaq World Wide Web site (www.compaq.com).

✎ Both the CD and the web site include *The Locator* with *Decision Support,* a comprehensive listing of the device drivers, utilities, flashable ROM images, and more, categorized by operating system, personal computer family, and model for easy retrieval. *Decision Support* provides detailed information for each piece of support software, including descriptions, features, enhancements, dependencies, and update criticalities.

■ You can purchase backup diskettes.

If you choose to purchase the *Support Software CD,* you have two options:

■ You can purchase a single CD-ROM that gives you one-time access to the latest support software (North America only, Compaq part number 272505-001).

■ You can purchase a yearly subscription that delivers up to 12 monthly CD-ROMs (Compaq part number 183426-xxx)

The annual subscription ensures your continuous access to the latest developments.

The CD or backup diskettes can be ordered from Compaq.

✎ When calling Compaq to place an order, be sure to have the serial number of your computer available. The location of the serial number is shown in Chapters 5 and 6 for the desktop and minitower models respectively. This number is necessary for all purchases.

2.11.5 Integration Management

Integration Management features include:

■ Desktop Management Interface

■ Compaq Insight Manager and the Insight Management Agents

■ Compaq Desktop Management Solutions Partners Program

■ Systems Management Partners Program

Desktop Management Interface

The Desktop Management Task Force (DMTF) is an industry body created in 1992 with the goal of standardizing systems manageability. DMTF established the Desktop Management Interface (DMI) framework to standardize access to PC configuration data. Compaq, as a Steering Committee and Technical Committee member of the DMTF, delivers hardware and software instrumentation that supports the DMI standard.

For more information on configuring the DMI software, refer to the online *Intelligent Manageability Guide*.

Compaq Insight Manager and the Insight Management Agents

Using the industry-standard Simple Network Management Protocol (SNMP) found in Microsoft Windows 95 and Windows NT Workstation, Compaq has continued the migration of management tools from servers to desktops by enhancing Compaq Insight Manager. Compaq Insight Manager allows the LAN administrator to remotely view AssetControl data, configuration data, memory change alerts, NIC performance data, and contact information. The tool also provides access to the Fault Management features of the Compaq Deskpro Personal Computer.

For more information on integrating with Insight Manager and configuring the Compaq Insight Management Agents, refer to the online *Intelligent Manageability Guide*.

Compaq Desktop Management Solutions Partners Program

Compaq delivers desktop management solutions today under Microsoft Windows 3.1, Windows 95, and Windows NT Workstation through the Compaq Desktop Management Solutions Partners Program. This Compaq initiative ensures compatibility and integration of AssetControl features with leading PC LAN management products. These products provide remote access to the AssetControl features so that LAN and PC administrators can manage Compaq Deskpro Family of Personal Computers information from a central location. The partnership ensures that the benefits of Intelligent Manageability are accessible through a broad range of vendors. This allows customers to use their tools of choice to remotely manage their Compaq Deskpro computers more confidently and cost effectively.

Compaq Desktop Management Solutions Partners include:

■ ASI (AssetPRO)

■ BindView (BindView Console)

■ Intel (LANDesk Management Suite)

■ McAfee Associates (Saber LAN Workstation)

■ Microsoft Corporation (Systems Management Server)

■ Novell (ManageWise)

■ Seagate (LAN Directory)

■ Symantec (Norton Administrator for Networks)

■ Tally Systems (NetCensus)

For more information on integrating with leading PC LAN management software, refer to the online *Intelligent Manageability Guide.*

Systems Management Partners Program

In addition to integrating Intelligent Manageability features with the PC LAN management applications highlighted above, Compaq also integrates these features with industry-leading enterprise management platform applications. This Compaq initiative ensures compatibility and integration of AssetControl and Fault Management features with tools that manage servers, hubs, routers, uninterruptible power supplies (UPSs), and other network devices. The result is an end-to-end solution that enables management of the entire enterprise from single console.

Systems Management Partners include:

■ BMC Software (Patrol)

■ Boole & Babbage (COMMAND/Post)

■ Cabletron (SPECTRUM Enterprise Manager)

■ Hewlett Packard (Compaq Insight Manager for OpenView)

■ Seagate (NerveCenter)

■ Tivoli (TME10)

■ Tivoli (Compaq Insight Manager for TME10 NetView)

For more information on integrating with Systems Management Partners, refer to the Compaq World Wide Web site (www.compaq.com).

2.12 Protecting Your Software

To protect your software from loss or damage, you should keep a backup copy of all system software, applications, and related files stored on your hard drive. You can order a set of backup diskettes from Compaq at nominal cost, or you can make your own set.

2.12.1 Ordering Backup Diskettes

You can order backup diskettes from Compaq for all of the software preinstalled on your computer. You can order all software as a single set, or you can order the various software packages separately.

✎ When calling Compaq to place an order, be sure to have the serial number of your computer available. The location of the serial number is shown in Chapters 5 and 6 for the desktop and minitower models respectively. This number is necessary for all purchases.

Compaq authorized dealers, resellers, and service providers can tell you what backup software combinations are currently available for your computer.

2.12.2 Restoring Your Hard Drive in Windows 95

If your hard drive has completely failed and you cannot access Windows 95, you will need to restore the Windows 95 operating system from your backup system diskettes prior to following the instructions below.

1. From the Windows desktop, click Start, point to Programs, point to Accessories, then click System Tools.
2. From the System Tools menu, click Backup. The computer starts the backup program.
3. Read the informational dialogs and click OK to continue.
4. A screen with three tabs (Backup, Restore, and Compare) appears. Click the Restore tab.
5. Insert the first backup diskette into the diskette drive.
6. Select the drive from which to restore files (the diskette drive).
7. Using your mouse, put a check in the box next to the files you want to restore. Putting a check next to the drive icon automatically selects all the files on that drive. (To deselect a file, click the box next to it.)
8. Click Next Step.
9. Select the destination drive.
10. Follow the instructions that appear on the screen until the installation is complete.

2.13 Prefailure Warranty

The Prefailure Warranty is standard for select components of all Compaq Monsters Series of Personal Computers. It extends the Compaq three-year, limited warranty by applying it to critical system components before they actually fail. The Prefailure Warranty ensures that when you receive notification of a prefailure condition through Compaq Insight Manager, the component is replaced under warranty.

The Compaq Monsters Series of Personal Computers components covered by the Prefailure Warranty are:

■ Error Correcting Code (ECC) memory (with ECC memory modules only)

■ IDE/EIDE hard drives

■ SCSI hard drives

■ Ultra ATA hard drives

chapter 3

ILLUSTRATED PARTS CATALOG

This chapter provides an illustrated parts breakdown and a reference for spare parts for the Compaq Deskpro 2000 Series of Personal Computers.

Figure 3-1. *Compaq Deskpro 2000 Series Personal Computer*

3.1 System Unit
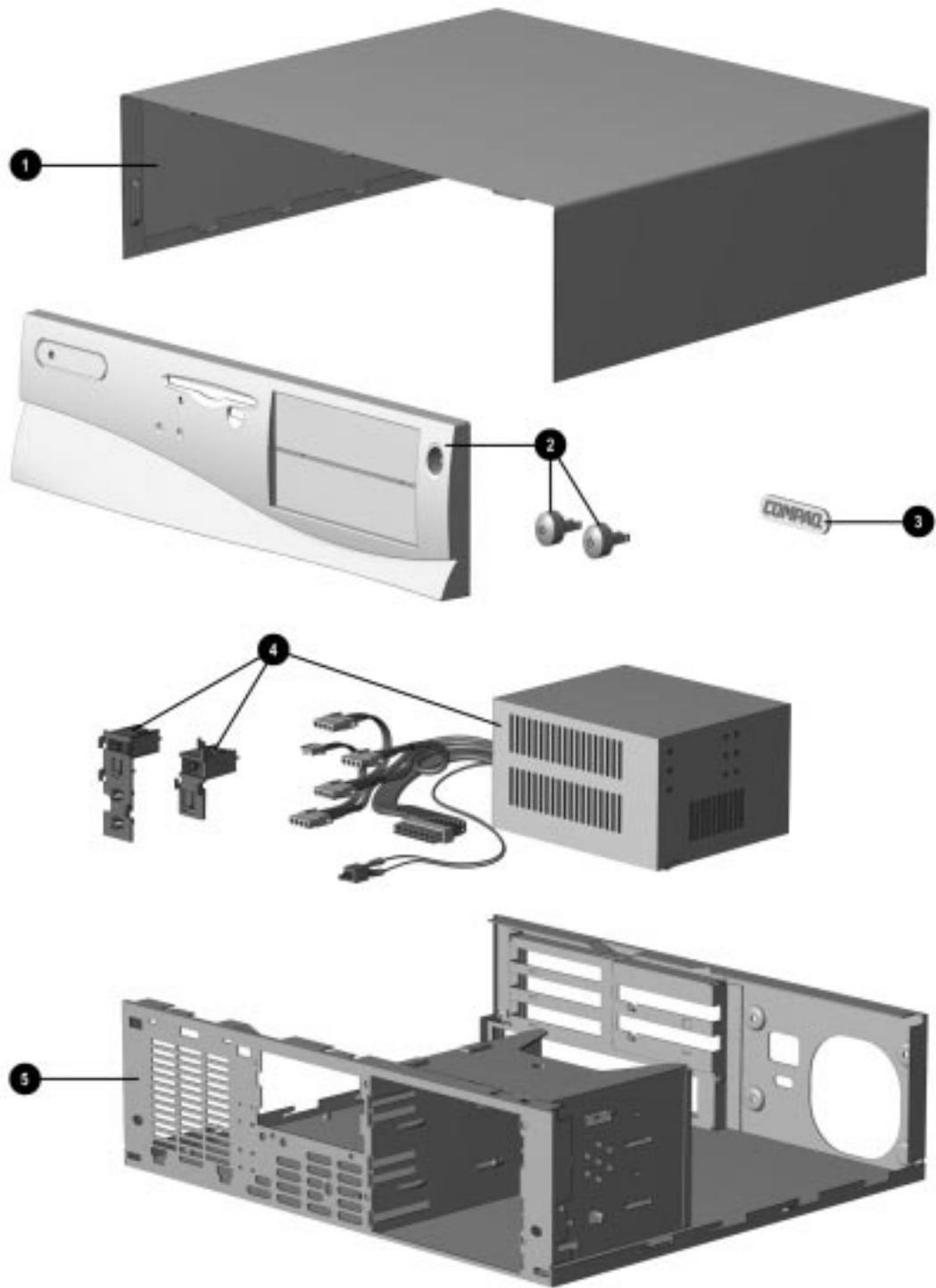
Figure 3-2. *System Unit, Desktop*

Table 3-1
System Unit Spare Parts: Desktop

Description	Spare Part Number	Warranty Tier
1. System unit cover, desktop	243089-001	A
2. Front bezel (includes 2 power switch caps and bezel blank; order logo separately)	243088-001	A
3. Logo kit (includes logos for all models)	247525-001	A
4. Power supply (includes fan, power switch, and 2 power switch mounting brackets)	278756-001	A
5. Chassis base pan (shown for reference only)		
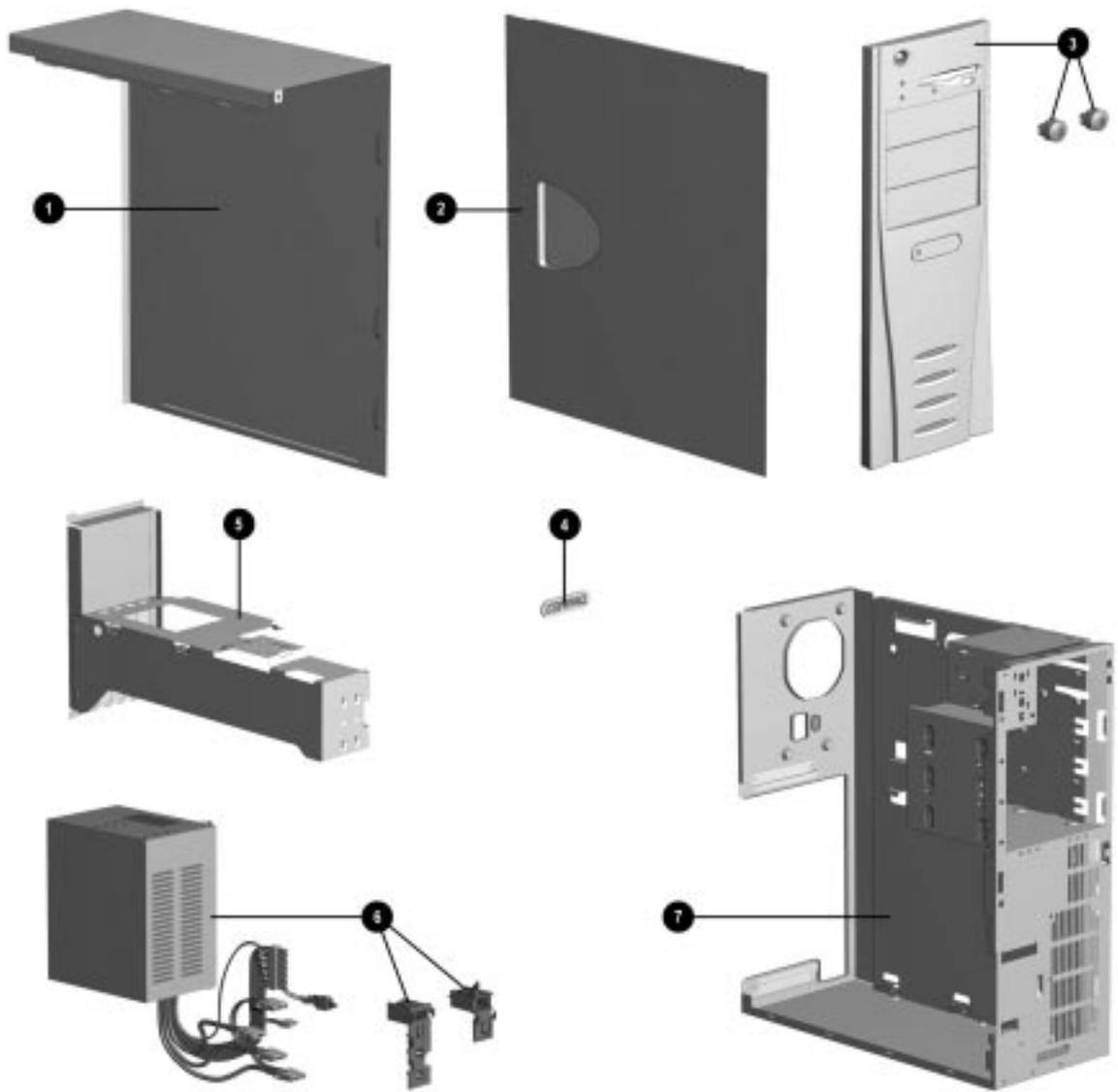
Figure 3-3. *System Unit, Minitower*

Table 3-2
System Unit Spare Parts: Minitower

Description	Spare Part Number	Warranty Tier
1. J hood, minitower	185972-001	A
2. Access panel, minitower	185971-001	A
3. Front bezel (includes 2 power switch caps and 2 bezel blanks; order logo separately	247378-001	A
4. Logo kit (includes logos for all models)	247525-001	A
5. Brace, riser, minitower	243190-001	A
6. Power supply (Includes fan, power switch, and 2 power switch mounting brackets)	278756-001	A
7. Chassis base pan (shown for reference only)		

3.2 Mass Storage Devices
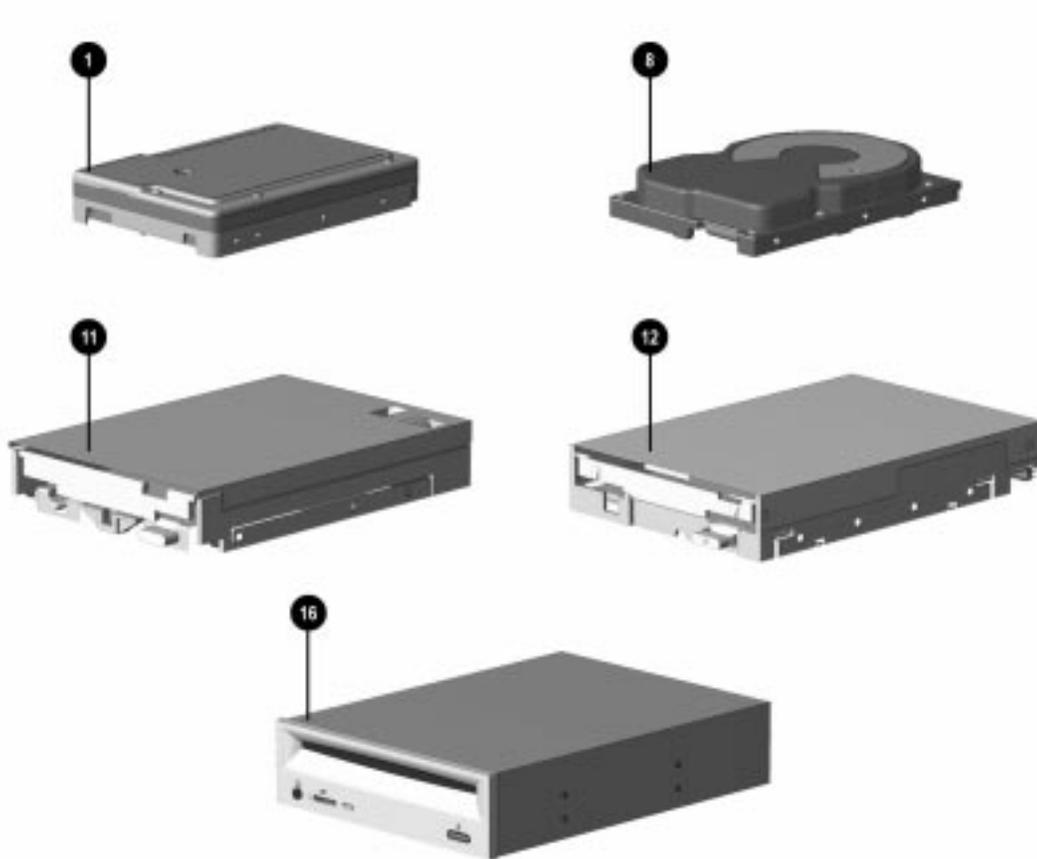
Figure 3-4. Mass Storage Devices

Table 3-3
Mass Storage Devices

Description	Spare Part Number	Warranty Tier
1. 2.1 GB EIDE hard drive	278745-001	A
2. 2.4-GB EIDE hard drive*	296679-001	A
3. 3.2-GB EIDE hard drive *	278746-001	A
4. 4.3-GB SCSI hard drive*	166526-001	A
5. 2.1-GB Ultra SCSI hard drive*	247409-001	A
6. 4.3-GB Ultra SCSI hard drive*	247408-001	A
7. 2.1-GB Ultra ATA hard drive*	278287-001	A
8. 2.4-GB Ultra ATA hard drive	296679-001	A
9. 3.2-GB Ultra ATA hard drive*	278288-001	A
10. 3.2-GB Ultra ATA hard drive*	278297-001	A
11. Diskette drive (3.5-in, 1.44-MB, 3-mode, 1/3-height w/o bracket and bezel)	160788-201	A
12. LS-120 drive (3.5-in, 120-/1.44-MB, internal)	263709-002	A
13. LS-120 drive (3.5-in, 120-/1.44-MB, external)*	294158-001	A
14. 4X SCSI PD-CD drive*	184691-201	A
15. 8X EIDE PD-CD drive*	185951-001	A
16. 16X max EIDE CD-ROM drive	278791-001	A
17. 24X max EIDE CD-ROM drive*	278026-001	A
18. 2/8-GB DAT tape drive w/compression*	142074-201	A
19. 4.0-GB Travan tape drive*	294126-001	A
20. 1.3-GB DAT tape cartridge*	131167-001	D
21. 2.0-GB DAT tape cartridge*	131148-001	D
22. 4.0-GB Travan tape cartridge*	294140-001	D
23. PD-CD media*	186075-001	D
24. LS-120 media*	186076-001	D

*Not shown.

3.3 Cables
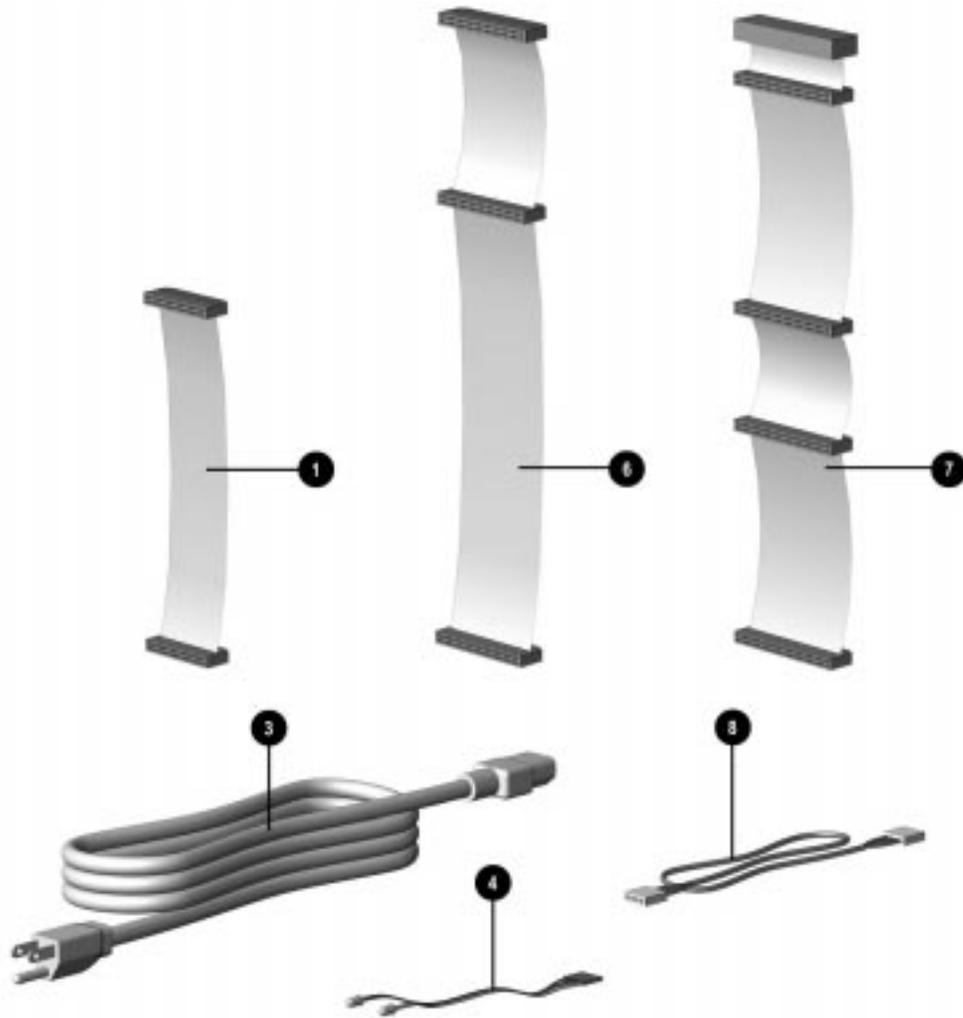
Figure 3-5. Cables

Table 3-4
Cables

Description	Spare Part Number	Warranty Tier
1. Cable, diskette drive	243084-001	A
2. Cable, EIDE CD-ROM/hard drive*	243085-001	A
3. Power cord, AC, Gray (US, Canada)	121258-001	A
4. Cable assembly, LED (desktop)	243095-001	A
5. Cable assembly, LED (minitower)*	243110-001	A
6. Cable, Dual IDE	247568-001	A
7. Cable, Ultra SCSI	148259-001	A
8. Cable, CD-ROM audio	171109-001	A
9. Cable, Dual Ultra ATA*	278296-001	A
10. Miscellaneous MPEG1 cable kit	340572-001	A

*Not shown.

3.4 Standard and Optional Boards
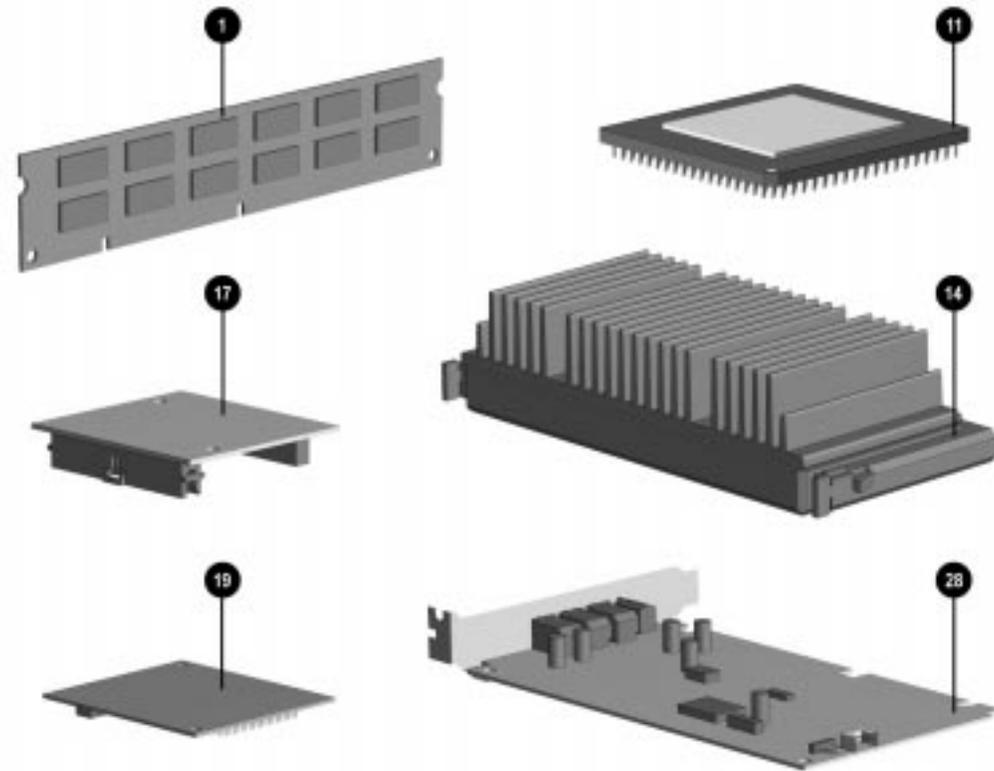
Figure 3-6. *Optional Boards*

Table 3-5
Standard and Optional Boards

Description	Spare Part Number	Warranty Tier
1. SDRAM memory module kit (DIMM, 8-MB)	288438-001	A
2. SDRAM memory module kit (DIMM, 16-MB)*	278066-001	A
3. SDRAM memory module kit (DIMM, 32-MB)*	278067-001	A
4. SDRAM memory module kit (DIMM, 64-MB)*	278095-001	A
5. SDRAM memory module kit (DIMM, 128-MB)*	278096-001	A
6. SDRAM ECC memory module kit (DIMM, 16-MB)*	278097-001	A
7. SDRAM ECC memory module kit (DIMM, 32-MB)*	166508-001	A
8. SDRAM ECC memory module kit (DIMM, 64-MB)*	278098-001	A
9. SDRAM ECC memory module kit (DIMM, 128-MB)*	278099-001	A
10. Cache memory (L2/256Kb, Pentium system only)*	278017-001	A
11. Pentium processor with MMX technology 166/66 (w/o thermal pad)	240181-001	A
12. Pentium processor with MMX technology 200/66* (w/o thermal pad)	240181-002	A
13. Pentium processor with MMX technology 233/66* (w/o thermal pad)	286258-001	A
14. Pentium II processor with MMX technology 233/66* (w/o thermal pad)	278262-001	A
15. Pentium II processor with MMX technology 266/66* (w/o thermal pad)	278263-001	A
16. Pentium II processor with MMX technology 300/66* (w/o thermal pad)	278289-001	A
17. SGRAM, 1 MB graphics memory upgrade	278093-001	A
18. SGRAM, 2 MB graphics memory upgrade*	278094-001	A
19. WRAM, 4 MB graphics memory upgrade (Pentium Millennium II board)	270260-001	A
20. WRAM, 12 MB graphics memory upgrade (Pentium II Millennium II board)*	166574-001	A
21. MPEG1 video board*	340571-001	A
22. Millennium II PCI video board*	243136-001	A
23. Ultra SCSI controller (PCI)*	247399-001	A
24. Plug and Play SCSI-2 controller (ISA)*	184751-001	A
25. 33.6-K data/fax modem (US)*	259214-002	A
26. Compaq Netelligent Corporate Communicator board (NA only)*	294710-001	A
27. ISDN modem*	273529-001	A
28. Compaq Enhanced Business Pro Audio ESS 1868	278792-001	A

* Not shown.

3.4 Standard and Optional Boards *Continued*
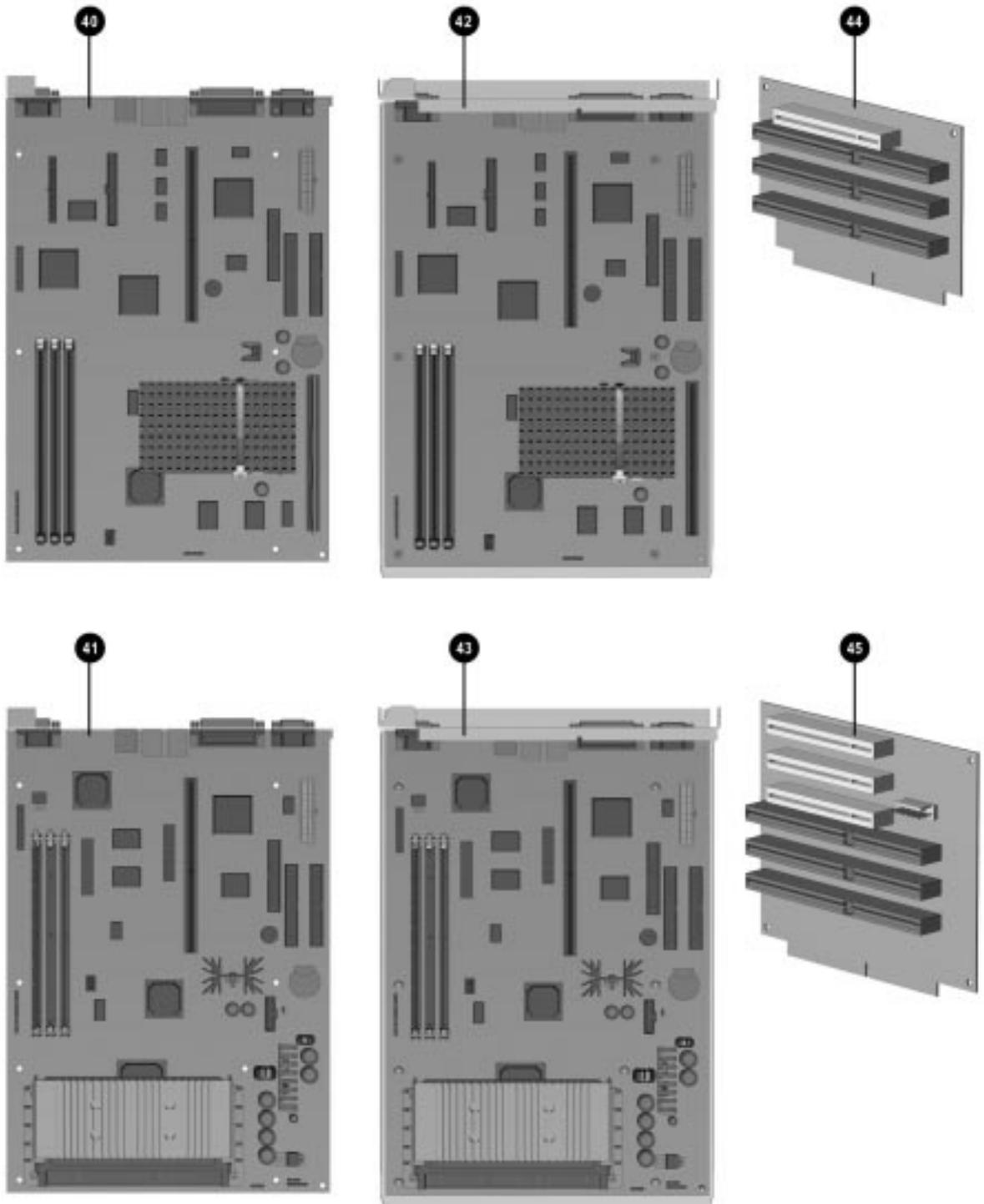
Figure 3-7. *System and Riser Boards*

Table 3-5 *continued*

Description	Spare Part Number	Warranty Tier
29. Serial/Parallel interface board*	106886-002	A
30. Netelligent 10T (ISA UTP)*	265617-001	A
31. Netelligent 10T/2 (ISA UTP/COAX)*	265618-001	A
32. Netelligent 10T (PCI UTP)*	242501-001	A
33. Netelligent 10T/2 (PCI UTP/COAX)*	292857-001	A
34. Netelligent 10/100 TX (PCI UTP)*	169849-001	A
35. Netelligent 4/16 TR (PCI IBM UTP/STP)*	199764-001	A
36. Netelligent 4/16 TR (ISA UTP/STP-S)*	265436-001	A
37. Netelligent 4/16 TR (PCI UTP/STP-S)*	268010-001	A
38. Token Ring controller (ISA, UTP/STP)*	301211-001	A
39. External AUI to BNC adapter*	192768-001	A
40. System board, Pentium, TR3 w/o processor or memory, desktop	278747-001	A
41. System board, Pentium II, w/o processor or memory, desktop	278258-001	A
42. System board, Pentium, TR3, w/o processor or memory, minitower	278799-001	A
43. System board, Pentium II, w/o processor or memory, minitower	278259-001	A
44. Riser board, desktop	278006-001	A
45. Riser board, minitower	243057-001	A

*Not shown.

✎ 1. Desktop system boards are spared with the I/O panel attached.
  2. Minitower system boards are spared mounted in the system board tray.

3.5 Keyboards
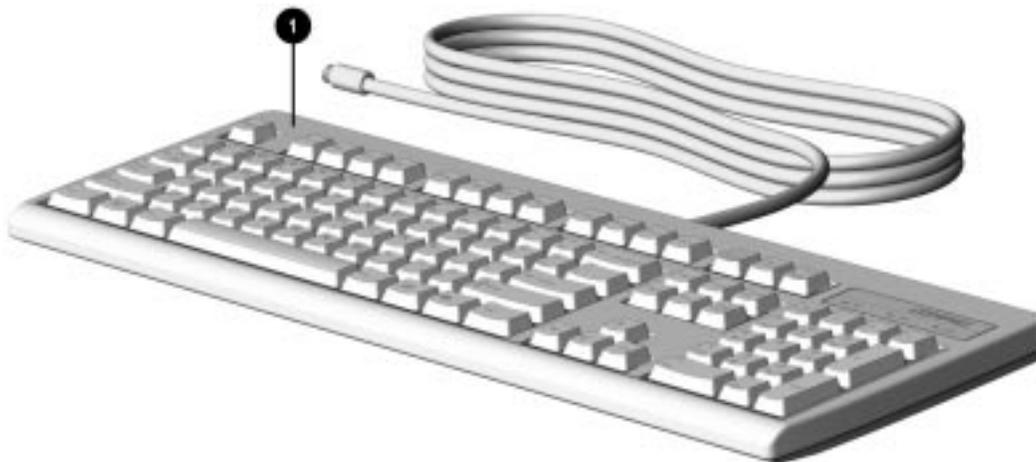
Figure 3-8. Keyboard

Table 3-6
Keyboards

Description	Spare Part Number	Warranty Tier
1 Keyboard (Domestic)*	166514-001	A
2. Keyboard (Arabic)*	166514-171	A
3. Keyboard (Belgian)*	166514-181	A
4. Keyboard (BHCSY)*	166514-B41	A
5. Keyboard (Brazilian)*	166514-201	A
6. Keyboard (Czech)*	166514-221	A
7. Keyboard (Danish)*	166514-081	A
8. Keyboard (Finnish)*	166514-351	A
9. Keyboard (French Canadian)*	166514-121	A
10. Keyboard (French)*	166514-051	A
11. Keyboard (German)*	166514-041	A
12. Keyboard (Greek)*	166514-151	A
13 Keyboard (Hungarian)*	166514-211	A
14. Keyboard (International)*	166514- B31	A
15. Keyboard (Italian)*	166514-061	A
16. Keyboard (Japanese)*	166514-191	A
17. Keyboard (Korean)*	166514- AD1	A
18. Keyboard (Latin American)*	166514-161	A
19. Keyboard (Norwegian)*	166514-091	A
20. Keyboard (Polish)*	166514-241	A

* Not shown.

Table 3-6 *continued*

Description	Spare Part Number	Warranty Tier
21. Keyboard (Portuguese)*	166514-131	A
22. Keyboard (Russian)*	166514-251	A
23. Keyboard (Slovakian)*	166514-231	A
24. Keyboard (Spanish)*	166514-071	A
25. Keyboard (Swedish)*	166514-101	A
26. Keyboard (Swiss)*	166514-111	A
27. Keyboard (Taiwanese)*	166514-AB1	A
28. Keyboard (Thai)*	166514-281	A
29. Keyboard (Turkish)*	166514-141	A
30. Keyboard (UK English)*	166514-031	A
31. Keyboard, Visioneer (Belgium/French)*	185288-318	A
32. Keyboard, Visioneer (Brazilian)*	185288-335	A
33. Keyboard, Visioneer (Domestic)*	185288-301	A
34. Keyboard, Visioneer (French)*	185288-305	A
35. Keyboard, Visioneer (German)*	185288-304	A
36. Keyboard, Visioneer (International*)	185288-302	A
37. Keyboard, Visioneer (Italian)*	185288-306	A
38. Keyboard, Visioneer (Japanese)*	185288-319	A
39. Keyboard, Visioneer (Latin American)*	185288-316	A
40. Keyboard, Visioneer (Spanish)*	185288-307	A
41. Keyboard, Visioneer (Swiss/French, French, Italian)*	185288-311	A
42. Keyboard, Visioneer (UK English)*	185288-303	A

*Not shown.

3.6 Monitors
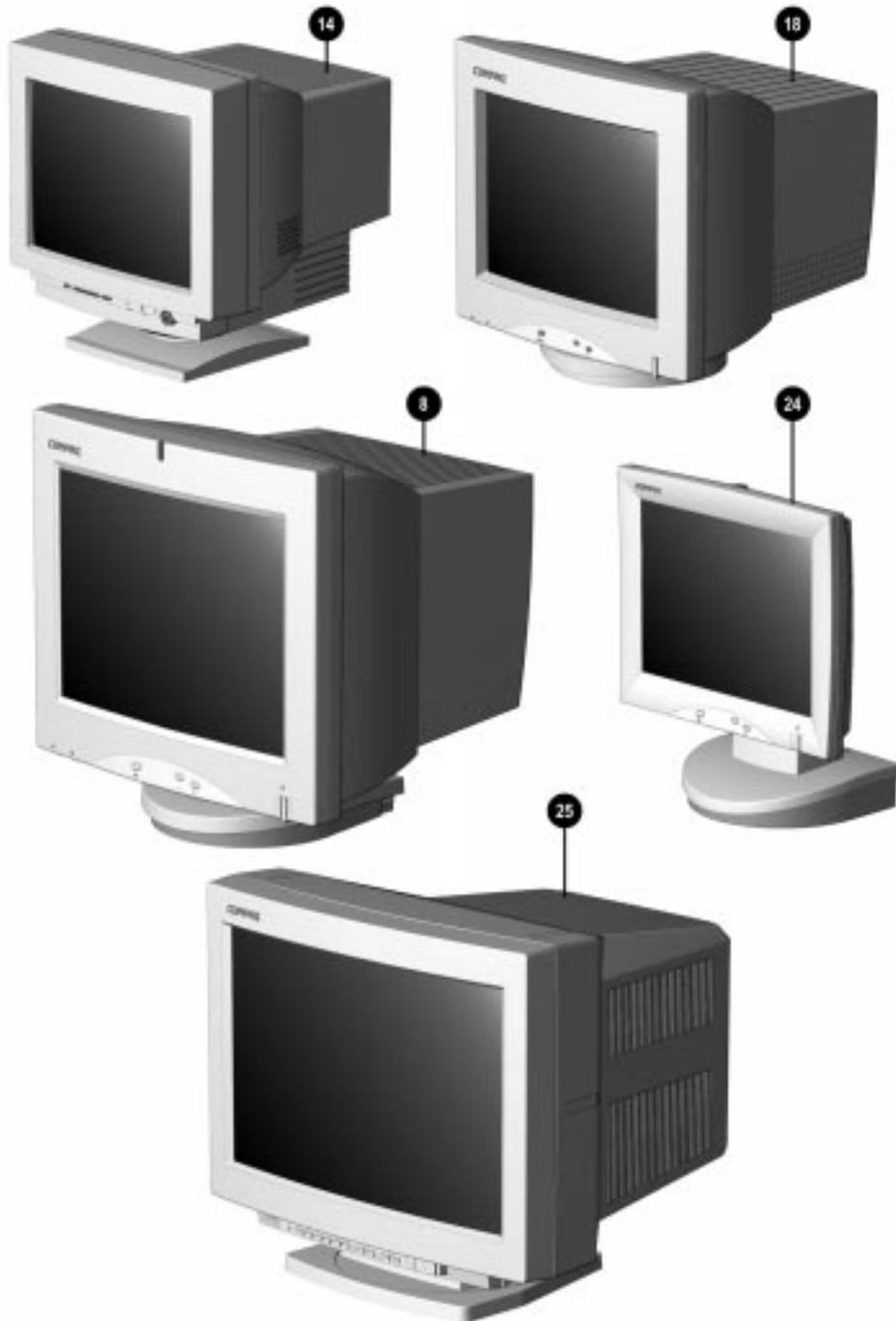
Figure 3-9. Monitors

Table 3-7
Monitors

Description	Spare Part Number	Warranty Tier
1. Compaq 140 VGA Color Monitor (NA)*	210507-601	A
2. Compaq P50 Color Monitor (NA)*	264202-001	A
3. Compaq P50 Color Monitor (GSA)*	264202-004	A
4. Compaq P50 Color Monitor (NH)*	264202-021	A
5. Compaq P50 Color Monitor (SH)*	264202-B21	A
6. Compaq P70 Color Monitor (NH)*	255652-001	A
7. Compaq P70 Color Monitor (SH)*	255652-B23	A
8. Compaq P110 (NH)	284959-001	A
9. Compaq P110 (SH)*	284959-B23	A
10. Compaq V40 Color Monitor (NH)*	307409-001	A
12. Compaq V40 Color Monitor (GSA)*	307409-004	A
13. Compaq V40 Color Monitor (SH)*	307409-B21	A
14. Compaq V50 Color Monitor (NA)	264152-001	A
15. Compaq V50 Color Monitor (GSA)*	264152-004	A
16. Compaq V50 Color Monitor (NH)*	264152-021	A
17. Compaq V50 Color Monitor (SH)*	264152- B21	A
18. Compaq V70 Color Monitor (NA)	255609-001	A
19. Compaq V70 Color Monitor (GSA)*	255609-004	A
20. Compaq V70 Color Monitor (NH)*	255638-021	A
21. Compaq V70 Color Monitor (SH)*	255638-B21	A
22. Compaq V70 Color Monitor (NH)*	255638-B22	A
23. Compaq V70 Color Monitor (SH)*	255638-B23	A

* Not shown.

Table 3-7 *continued*

Description	Spare Part Number	Warranty Tier
24. Compaq TFT500 15.1-inch Flat Panel (repair parts listed below)		A
Power supply*	296473-001	A
Monitor base*	296474-001	A
Cable access cover*	296475-001	A
Rear enclosure*	296476-001	A
Shield/support bracket*	296477-01	A
Controller assembly*	296478-001	A
TFT-LCD panel assembly*	296481-001	A
Backlight bulbs (2 each)*	296480-001	A
Protective cover*	296738-001	A
Front bezel assembly	296479-001	A
Security locking bracket*	296483-001	A
Miscellaneous internal cables*	296482-001	A
Mounting arm*	285041-001	A
VGA cable for mounting arm*	285042-001	A
Power cable for mounting arm*	285043-001	A
Miscellaneous screw kit*	286739-001	A
25. Compaq P1610W Color Monitor	305710-001	A
26. Compaq V90 Color Monitor	305602-001	A

*Not shown.

3.7 Miscellaneous Hardware Kit
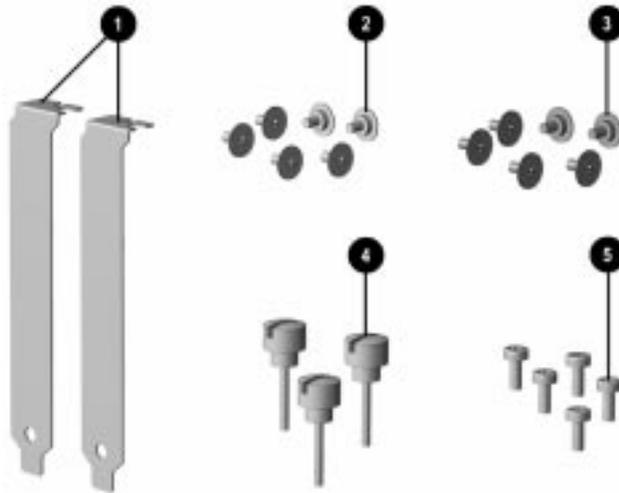
Figure 3-10. *Miscellaneous Hardware Kit*

Table 3-8
Miscellaneous Hardware Kit

Description	Spare Part Number	Warranty Tier
Miscellaneous hardware kit. Includes:	243087-001	D

1. Slot cover (2 each)
2. Screw, 6-32, TT, wafer head (6 each)
3. Screw, M3, TT, wafer head (6 each)
4. Thumb screw (3 each)
5. Screw, M3, TT, H/TOP, S151P X 6.5 (5 each)

3.8 Miscellaneous Plastics Kit
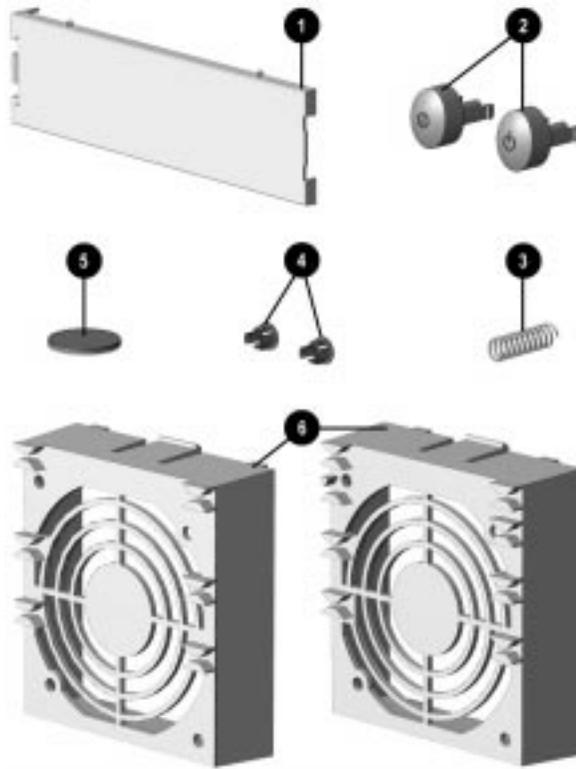
Figure 3-11. *Miscellaneous Plastics Kit, Desktops*

Table 3-9
Miscellaneous Plastics Kit, Desktops

Description	Spare Part Number	Warranty Tier
Miscellaneous plastics kit, includes:	243090-001	D
1. Bezel blank, 1/2 height (1 each) 2. Power button (2 each: 1 DC, 1 AC) 3. Spring (1 each) 4. Plastic grommets (2 each for LED cable) 5. Rubber feet (4 each) 6. Card guide (2 each; 1 P54C , 1 P55C/Pentium II) 7. AC/DC switch cap RTF card* 8. Card guide RTF card*		
* Not shown.		
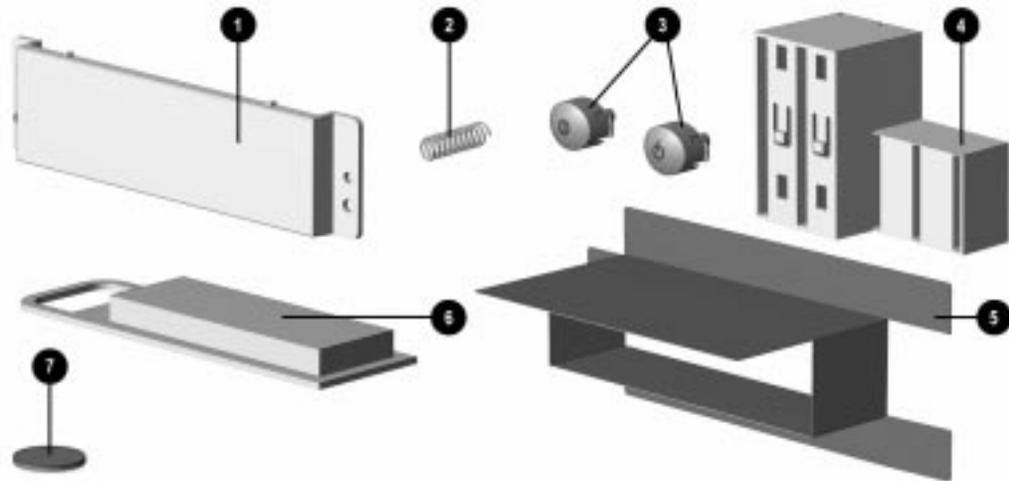
Figure 3-12. *Miscellaneous Plastics Kit, Minitowers*

Table 3-10
Miscellaneous Plastics Kit, Minitowers

Description	Spare Part Number	Warranty Tier
Miscellaneous plastics kit, includes:	243107-001	D
1. Bezel blank, 1/2 height (1 each)		
2. Spring (1 each)		
3. Power button (2 each: 1 DC, 1 AC)		
4. Retainer, ISA Option Board (1 each)		
5. Air duct (for Pentium II minitower systems only)		
6. Guide, Option Card (1 each)		
7. Rubber feet (4 each)		
8. AC/DC switch cap RTF card*		
* Not shown.		

3.9 Miscellaneous Parts

Figure 3-13. Miscellaneous Metals Kit, Desktops

**Table 3-11
Miscellaneous Metals Kit, Desktops**

Description	Spare Part Number	Warranty Tier
Miscellaneous metals kit, includes:	243185-001	D
1. Diskette/hard drive cage		
2. Riser brace		
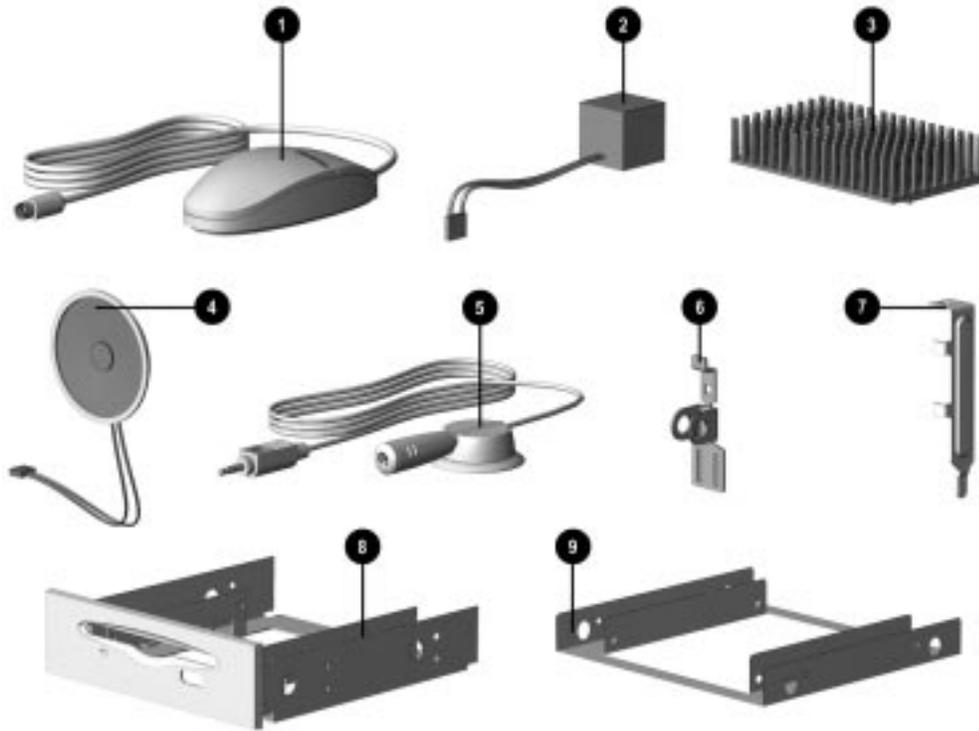
Figure 3-14. *Miscellaneous Parts*

Table 3-12
Miscellaneous Parts

Description	Spare Part Number	Warranty Tier
1. Two-button mouse	141189-401	A
2. Battery, real-time clock (external)	160274-001	A
3. Heat sink, Pentium processor (w/ 2 thermal pads)	243128-001	D
4. Speaker, 2.5-in, 0.6 W (audio option kit)	247508-001	D
5. Microphone assembly w/ base (audio option kit)	278266-001	D
6. Security lock bracket with screw	173066-001	D
7. Bracket board retainer	268247-001	A
8. Diskette drive mounting bracket, 3.5-in to 5.25-in	243230-001	D
9. Hard drive mounting bracket, 3.5-in to 5.25-in	243231-001	D
10. Multi-media sound system (U.S.)*	294122-001	D
11. Heat sink, Pentium II processor (w/ 1 thermal pad)*	278264-001	D

* Not shown.

Figure 3-15. *Power Switch Kit*

Table 3-13
Power Switch Kit

Description	Spare Part Number	Warranty Tier
Power switch kit, includes:	278054-001	D
1. Power switch (5 each)		
2. Desktop mounting bracket (5 each)		
3. Minitower mounting bracket (5 each)		

3.10 Shipping Boxes

Table 3-14
Shipping Boxes

Description	Spare Part Number	Warranty Tier
Shipping box, final - desktop (5 each)*	278076-001	D
Shipping box, generic - desktop (5 each)	243092-001	D
Shipping box, final - minitower (5 each)*	185968-001	D
Shipping box, generic - minitower (5 each)	243108-001	D
Packing cushion, desktop	243093-001	D
Packing cushion, minitower	243109-001	D
Box and packing, V70 Monitor	255616-001	D
Shipping box, V70 Monitor (5 each)	255617-001	D
Box and packing, QV210 Monitor	210412-001	D
Shipping box, QV210 Monitor (5 each)	210413-001	D

* Not available in U.S.

3.11 Documentation

Table 3-15
Documentation

Description	Spare Part Number	Warranty Tier
Maintenance & Service Guide (desktop & minitower)	278041-001	D
Illustrated Parts Map (desktop & minitower)	278042-001	D
User's Guide, Qvision 210 Color Monitor	210414-001	D
User's Guide, Qvision 200 AssetControl Monitor	143395-001	D
User's Guide, Qvision 172 AssetControl Monitor	143533-003	D
Documentation kit includes:* 　Windows 95 manual 　Reference Guide 　Program License 　Owner's Registration 　Mouse 　AC Power Cord 　Lock Bracket Assembly	243047-001	D
Windows NT 4.0 Workstation User's Guide (Danish)	244728-081	D
Windows NT 4.0 Workstation User's Guide (English)	244728-001	D
Windows NT 4.0 Workstation User's Guide (Finnish)	244728-351	D
Windows NT 4.0 Workstation User's Guide (French)	244728-051	D
Windows NT 4.0 Workstation User's Guide (German)	244728-041	D
Windows NT 4.0 Workstation User's Guide (Italian)	244728-061	D
Windows NT 4.0 Workstation User's Guide (Japanese)	244728-191	D
Windows NT 4.0 Workstation User's Guide (Latin American Spanish)	244728-161	D
Windows NT 4.0 Workstation User's Guide (Netherlands)	244728-331	D
Windows NT 4.0 Workstation User's Guide (Norwegian)	244728-091	D
Windows NT 4.0 Workstation User's Guide (Swedish)	244728-101	D

* English only.

3.12 Software

<div align="center">

Table 3-16
Software

</div>

Description*	Spare Part Number	Warranty Tier
Diagnostics and Setup Diskettes for Commercial Desktops (Brazilian Portuguese)	275097-201	D
Diagnostics and Setup Diskettes for Commercial Desktops (Danish)	275097-081	D
Diagnostics and Setup Diskettes for Commercial Desktops (Dutch)	275097-331	D
Diagnostics and Setup Diskettes for Commercial Desktops (English)	275097-001	D
Diagnostics and Setup Diskettes for Commercial Desktops (Finnish)	275097-351	D
Diagnostics and Setup Diskettes for Commercial Desktops (French)	275097-051	D
Diagnostics and Setup Diskettes for Commercial Desktops (German)	275097-041	D
Diagnostics and Setup Diskettes for Commercial Desktops (Italian)	275097-061	D
Diagnostics and Setup Diskettes for Commercial Desktops (Japanese)	275097-291	D
Diagnostics and Setup Diskettes for Commercial Desktops (Norwegian)	275097-091	D
Diagnostics and Setup Diskettes for Commercial Desktops (Portuguese)	275097-131	D
Diagnostics and Setup Diskettes for Commercial Desktops (Spanish)	275097-071	D
Diagnostics and Setup Diskettes for Commercial Desktops (Swedish)	275097-101	D
IDE CD-ROM Driver Diskette Kit (Danish)	181456-081	D
IDE CD-ROM Driver Diskette Kit (Dutch)	181456-331	D
IDE CD-ROM Driver Diskette Kit (English)	181456-001	D
IDE CD-ROM Driver Diskette Kit (Finnish)	181456-351	D
IDE CD-ROM Driver Diskette Kit (French)	181456-051	D
IDE CD-ROM Driver Diskette Kit (German)	181456-041	D
IDE CD-ROM Driver Diskette Kit (Italian)	181456-061	D
IDE CD-ROM Driver Diskette Kit (Norwegian)	181456-091	D
IDE CD-ROM Driver Diskette Kit (Portuguese)	181456-131	D
IDE CD-ROM Driver Diskette Kit (Spanish)	181456-071	D
IDE CD-ROM Driver Diskette Kit (Swedish)	181456-101	D
IDE PD-CD Driver Diskette Kit	275940-001	D
Mouse Driver Kit (French)	133421-051	D
Mouse Driver Kit (German)	133421-041	D
Mouse Driver Kit (Italian)	133421-061	D
Mouse Driver Kit (Spanish)	133421-071	D
Mouse Driver Kit (US/UK)	133421-001	D

* International spares are not available from Houston. North American customers can order backup sets of all software on diskette format from the Compaq Order Center.

Table 3-16 *Continued*

Description	Spare Part Number	Warranty Tier
Desktop management 3.0 Agents	274986-001	D
SCO Unix Support Drivers	125873-001	D
OS/2 Support Drivers	196004-001	D
S3 Trio64V2/GX (Brazilian Portuguese) (Pentium system only)	276067-201	D
S3 Trio64V2/GX (Czechoslovakian) (Pentium system only)	276067-221	D
S3 Trio64V2/GX (Danish) (Pentium system only)	276067-081	D
S3 Trio64V2/GX (Dutch) (Pentium system only)	276067-331	D
S3 Trio64V2/GX (English) (Pentium system only)	276067-001	D
S3 Trio64V2/GX (Finnish) (Pentium system only)	276067-351	D
S3 Trio64V2/GX (French) (Pentium system only)	276067-051	D
S3 Trio64V2/GX (German) (Pentium system only)	276067-041	D
S3 Trio64V2/GX (Hungarian) (Pentium system only)	276067-211	D
S3 Trio64V2/GX (Italian) (Pentium system only)	276067-061	D
S3 Trio64V2/GX (Japanese) (Pentium system only)	276067-291	D
S3 Trio64V2/GX (Norwegian) (Pentium system only)	276067-091	D
S3 Trio64V2/GX (Polish) (Pentium system only)	276067-241	D
S3 Trio64V2/GX (Portuguese) (Pentium system only)	276067-131	D
S3 Trio64V2/GX (Russian) (Pentium system only)	276067-251	D
S3 Trio64V2/GX (Spanish) (Pentium system only)	276067-071	D
S3 Trio64V2/GX (Swedish) (Pentium system only)	276067-101	D
S3 Trio64V2/GX (Thai) (Pentium system only)	276067-281	D
Windows NT Support Drivers	196012-001	D
Flash for System ROM	183986-001	D
ESS 1868 Audio Drivers	274987-001	D
QuickFind for Windows CD-ROM Kit (US)	137906-0XX†	D
QuickFind for Windows CD-ROM Kit (Outside US)	137907-0XX†	D
Matrox Video Drivers (Pentium II system only)	183463-001	D

* International spares are not available from Houston. North American customers can order backup sets of all software on diskette format from the Compaq Order Center.

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

continued

Table 3-16 *Continued*

Description*	Spare Part Number	Warranty Tier
Remote Service Drivers (Danish)	276068-081	D
Remote Service Drivers (Dutch)	276068-331	D
Remote Service Drivers (English)	276068-001	D
Remote Service Drivers (Finnish)	276068-351	D
Remote Service Drivers (French)	276068-051	D
Remote Service Drivers (German)	276068-041	D
Remote Service Drivers (Italian)	276068-061	D
Remote Service Drivers (Norwegian)	276068-091	D
Remote Service Drivers (Portuguese)	276068-101	D
Remote Service Drivers (Spanish)	276068-071	D
NT Diagnostics (Brazillian Portuguese)	276069-201	D
NT Diagnostics (Danish)	276069-081	D
NT Diagnostics (Dutch)	276069-331	D
NT Diagnostics (English)	276069-001	D
NT Diagnostics (Finnish)	276069-351	D
NT Diagnostics (French)	276069-051	D
NT Diagnostics (German)	276069-041	D
NT Diagnostics (Italian)	276069-061	D
NT Diagnostics (Japanese)	276069-291	D
NT Diagnostics (Norwegian)	276069-091	D
NT Diagnostics (Portuguese)	276069-101	D
NT Diagnostics (Spanish)	276069-071	D

* International spares are not available from Houston. North American customers can order backup sets of all software on diskette format from the Compaq Order Center.

chapter 4

REMOVAL AND REPLACEMENT PRELIMINARIES

This chapter provides general service information for the computer. Adherence to the procedures and precautions described in this chapter is essential for proper service.

4.1 Electrostatic Discharge Information

A sudden discharge of static electricity from your 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 can work perfectly throughout a normal cycle. The device 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.

4.1.1　Generating Static

Table 4-1 shows how different activities generate static electricity at different electrostatic voltage levels.

Table 4-1
Typical Electrostatic Voltages

	Relative Humidity		
Event	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 tube	2,000 V	700 V	400 V
Removing DIPs* from vinyl tray	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 PCB	26,500 V	20,000 V	7,000 V
Packing PCBs in foam-lined box	21,000 V	11,000 V	5,000 V

*Dual Inline Packaging (DIP) is the packaging around individual microcircuitry. These are then multi-packaged inside plastic tubes, trays, or Styrofoam.

✎　700 volts can degrade a product.

4.1.2   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 to electric components and accessories.

- To avoid hand contact, transport products in static-safe containers such as tubes, bags, or boxes.

- Protect all electrostatic sensitive 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.

- Avoid contact with pins, leads, or circuitry.

- Place reusable electrostatic-sensitive parts from assemblies in protective packaging or conductive foam.

4.1.3   Personal Grounding Methods

The method for grounding must include either 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 foot straps and a grounded floor mat.

Table 4-2
Static Shielding Protection Levels

Method	Voltage
Antistatic plastic	1,500
Carbon-loaded plastic	7,500
Metallized laminate	15,000

4.1.4   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, foot 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.

- 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.

4.1.5   Personal Grounding Equipment

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

Wrist straps are flexible straps with a minimum of one-megohm +/- 10% resistance in the ground cords. To provide proper ground, a strap must be worn snug against bare skin. The ground cord must be connected and fit snugly into the banana plug connector on the grounding mat or workstation.

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

4.1.6   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 one-megohm resistance

- Static-dissipative table or floor mats with hard tie to ground

- Field service kits

- Static awareness labels

- Wrist straps and footwear straps providing one-megohm +/- 10% resistance

- Material handling packages

- Conductive plastic bags

- Conductive plastic tubes

- Conductive tote boxes

- Opaque shielding bags

- Transparent metallized shielding bags

- Transparent shielding tubes

4.2 Routine Care

4.2.1 General Cleaning Safety Precautions

1. Never use solvents or flammable solutions to clean the computer.

2. Never immerse any parts in water or cleaning solutions; apply any liquids to a clean cloth and then use the cloth on the component.

3. Always turn off the computer when cleaning with liquids or damp cloths.

4. Always turn off the computer before cleaning the keyboard, mouse, or air vents.

5. Disconnect the keyboard before cleaning it.

6. Wear safety glasses equipped with side shields when cleaning the keyboard.

4.2.2 Cleaning the Computer Case

Follow all safety precautions in Section 4.2.1 before cleaning the computer.

To clean the computer case, follow the procedures described below:

- To remove light stains or dirt, use plain water with a clean, lint-free cloth or swab.

- For stronger stains, use a mild dishwashing liquid diluted with water. Rinse well by wiping with a cloth or swab dampened with clear water.

- For stubborn stains, use isopropyl (rubbing) alcohol. No rinsing is needed as the alcohol will evaporate quickly and not leave a residue.

- After cleaning, always wipe the unit with a clean, lint-free cloth.

- Occasionally, clean the air vents on the computer. Lint and other foreign matter can block the vents and limit the airflow.

4.2.3   Cleaning the Keyboard

Follow all safety precautions in Section 4.2.1 before cleaning the keyboard.

To clean the tops of the keys or the keyboard body, follow the procedures described in Section 4.2.2.

When cleaning debris from under the keys, review all rules in Section 4.2.1 before following these procedures:

> ⚠ **CAUTION:** Use safety glasses equipped with side shields before attempting to clean debris from under the keys.

- Visible debris underneath or between the keys may be removed by vacuuming or shaking.

- Canned, pressurized air may be used to clean debris from under the keys. Caution should be used as too much air pressure can dislodge lubricants applied under the wide keys.

- If you remove a key, use a specially designed key puller to prevent damage to the keys. This tool is available through many electronic supply outlets.

> ⚠ **CAUTION:** Never remove a wide leveled key (like the space bar) from the keyboard. If these keys are improperly removed or installed, the keyboard may not function properly.

- Cleaning under a key may be done with a swab moistened with isopropyl alcohol and squeezed out. Be careful not to wipe away lubricants necessary for proper key functions. Use tweezers to remove any fibers or dirt in confined areas. Allow the parts to air dry before reassembly.

4.2.4   Cleaning the Monitor

- Wipe the monitor screen with a clean cloth moistened with water or with a towelette designed for cleaning monitors. Do not use sprays or aerosols directly on the screen, the liquid may seep into the housing and damage a component. Never use solvents or flammable liquids on the monitor.

- To clean the monitor body, follow the procedures in Section 4.2.2

4.2.5   Cleaning the Mouse

Before cleaning the mouse, ensure that the power to the computer is turned off.

- Clean the mouse ball by first removing the retaining plate and the ball from the housing. Pull out any debris from the ball socket and wipe the ball with a clean dry cloth before reassembly.

- To clean the mouse body, follow the procedures in Section 4.2.2.

4.3 Service Considerations

Listed below are some of the considerations that you should keep in mind during the disassembly and assembly of the computer.

4.3.1 Tools and Software Requirements

To service the computer, you need the following:

- Torx T-15 screwdriver

- Flat-bladed screwdriver

- Diagnostics software

- Tool kit, Compaq part number 100767-001 (includes case utility tool, connector removal tool, and loop-back plugs)

4.3.2 Screws

The screws used in the computer are not interchangeable. They may have standard or metric threads and may be of different lengths. The standard screws have a silver finish, while the metric screws have a black finish. If an incorrect screw is used during the reassembly process, it can damage the unit. Compaq strongly recommends that all screws removed during disassembly be kept with the part that was removed, then returned to their proper locations.

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

4.3.3 Cables and Connectors

Most cables used throughout the unit are flat, flexible cables. These cables must be handled with 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 the cables are routed in such a way that they cannot be caught or snagged by parts being removed or replaced.

⚠ **CAUTION:** When servicing this computer, ensure that cables are placed in their proper location during the reassembly process. Improper cable placement can damage the computer.

4.3.4   Hard Drives

■   Handle hard drives as delicate precision components, avoiding all physical shock and vibration. This applies to failed drives as well as replacement spares.

■   Use only the packaging provided by Compaq for shipping.

■   Do not remove hard drives from the shipping package for storage. Keep hard drives in their protective packaging until they are actually mounted in the CPU.

■   Avoid dropping drives from any height onto any surface.

4.3.5   Plastic Parts

Plastic parts can be damaged by the use of excessive force during disassembly and reassembly. When handling the plastic parts, use care. Do not use a screwdriver or similar tool to pry apart the plastic components; use the case utility tool provided in the Compaq tool kit PN 100767-001.

4.3.6   Lithium Battery

The battery that came with the computer is non-replaceable and is permanently soldered onto the system board. Do not attempt to remove the lithium battery when installing a replacement battery. The lithium battery may explode if mishandled.

> **CAUTION:** Never attempt to remove a lithium battery. You can damage the system board in such an attempt, thereby making it unusable. Do not abuse or disassemble the lithium battery, as it may explode if mistreated.

chapter 5

REMOVAL AND REPLACEMENT PROCEDURES - DESKTOP

This chapter provides subassembly/module level removal and replacement procedures for desktop models of the Compaq Deskpro 2000 Series of Personal Computers.

After completing all necessary removal and replacement procedures, run the Diagnostics utility to verify that all components operate properly.

5.1 Serial Number

The computer serial number should be provided to Compaq when requesting information or ordering spare parts. The serial number is displayed on the right side of the system unit cover towards the front ❶, and also on the rear of the chassis above the fan ❷.

Figure 5-1. *Serial Number Location*

5.2 Disassembly Sequence Chart

Use the chart below to determine the disassembly sequence for removing components from the computer.

5.4	Computer Feet
5.5	Cable Lock

5.6	System Unit Cover

5.7	Speaker
5.8	Expansion Board

5.9.1	Memory Module
5.9.2	System Board Graphics Memory Module
5.10	Riser Board

5.11	Riser Brace

5.12	Expansion Board Guide
5.13	Replacement Battery
5.14.1	Front Bezel

5.14.2	Power Button
5.14.3	Bezel Blank
5.14.4	Compaq Logo
5.15.1	Power Switch Assembly

5.15.2	Power Supply

5.16	Mass Storage Devices
5.17	Drive Cage

5.9.3	Microprocessor (for Pentium II, remove expansion boards also)
5.9.4	Cache Memory (Pentium only, remove expansion boards also)
5.18	LED Cable
5.19	System Board (remove Riser Board also)

5.3 Preparation for Disassembly

See Chapter 4, "Removal and Replacement Preliminaries," for initial procedures.

To prepare the computer for disassembly, complete the following steps:

1. Remove any diskette, compact disc, or tape from the computer.

2. Turn off the computer and any peripheral devices that are connected to it.

△ **CAUTION:** Turn off the computer before disconnecting any cables.

3. Disconnect the power cord from the electrical outlet and then from the computer.

4. Disconnect all peripheral device cables from the computer.

✎ During disassembly, label each cable as you remove it, noting its position and routing. Keep all screws with the units removed.

△ **CAUTION:** The screws used in the computer are of different thread sizes and lengths; using the wrong screw in an application may damage the unit.

5.4 Feet

Four rubber feet are mounted to the underside of the chassis. If necessary, remove the old feet and scrape the residue of the old feet from the chassis using a small, flat-bladed screwdriver. To attach replacement feet to the chassis, remove the protective strip from the adhesive on the back of the new feet and press them into place.

Figure 5-2. *Installing the Feet*

5.5 Cable Lock

To install the cable lock provision, complete the following steps:

1. Remove one thumbscrew from the rear of the computer. Use a flat-bladed screwdriver if needed to loosen a stubborn screw.

2. Separate the pieces of the security bracket by bending the metal where the three pieces join (see inset).

3. Insert the tang of the narrow bracket into the slot and slide the U-shaped bracket between the narrow bracket and the system unit cover (see inset); then, install the self-tapping screw included in the cable lock kit.

4. Cover the screw with the flat portion of the bracket.

5. Install a lock (not provided) to secure the top part of the security bracket to control access to the inside of the computer. Install a cable lock (not provided) to secure the computer to an immovable location.
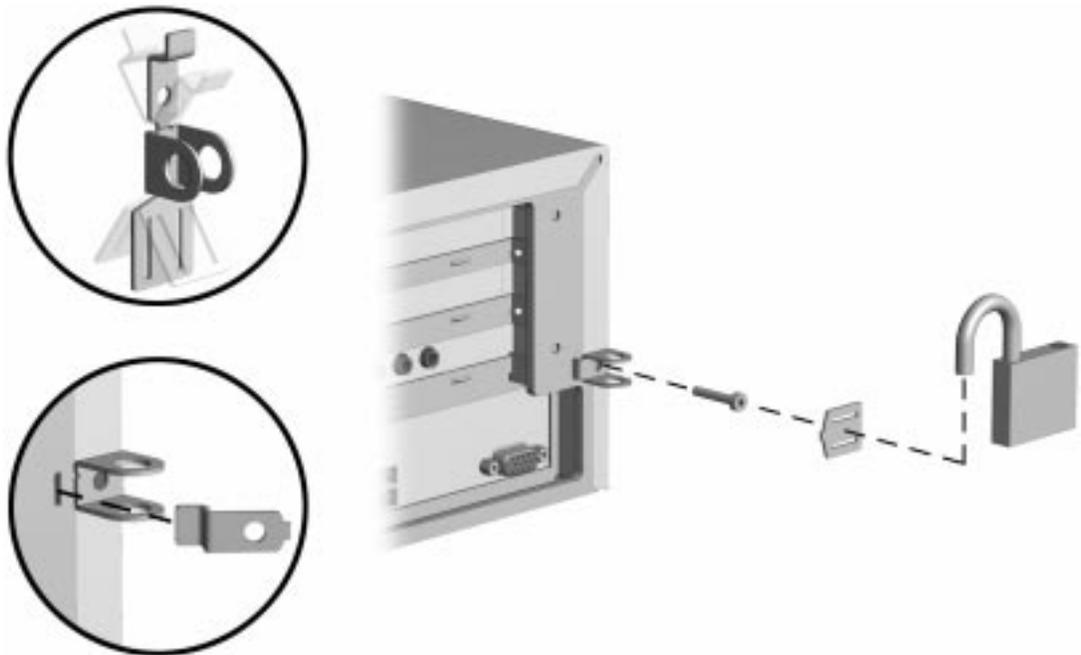
Figure 5-3. *Installing the Cable Lock*

To remove the cable lock provision, reverse the above procedure.

5.6 System Unit Cover

To remove the system unit cover, complete the following steps:

1. Prepare the computer for disassembly (Section 5.3).

2. Remove the thumbscrews at the rear of the computer to release the cover. You may need a flat-bladed screwdriver to loosen a stubborn screw.

   If the computer has a cable lock mechanism installed, refer to Section 5.5 for removal procedures.

3. Slide the computer cover back about 1 inch (2.5 cm); then, lift it up and off of the unit.
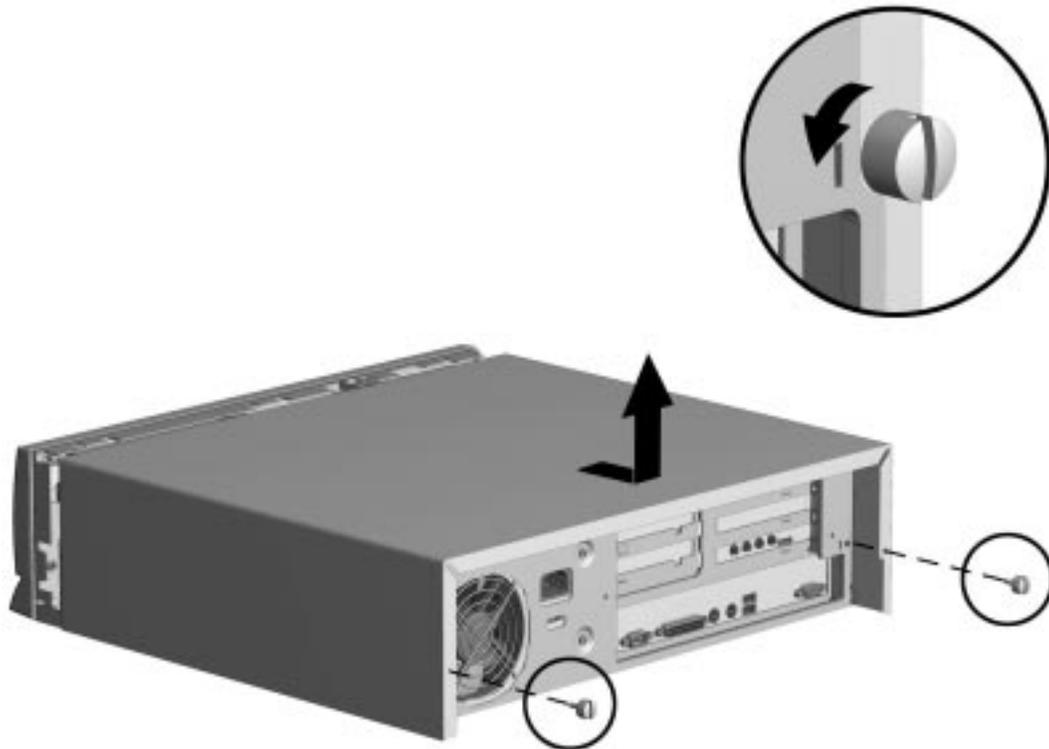
Figure 5-4. *Removing the System Unit Cover*

To replace the cover, reverse the above procedure.

5.7 Speaker

To remove the speaker, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Disconnect the speaker cable from the audio expansion board.
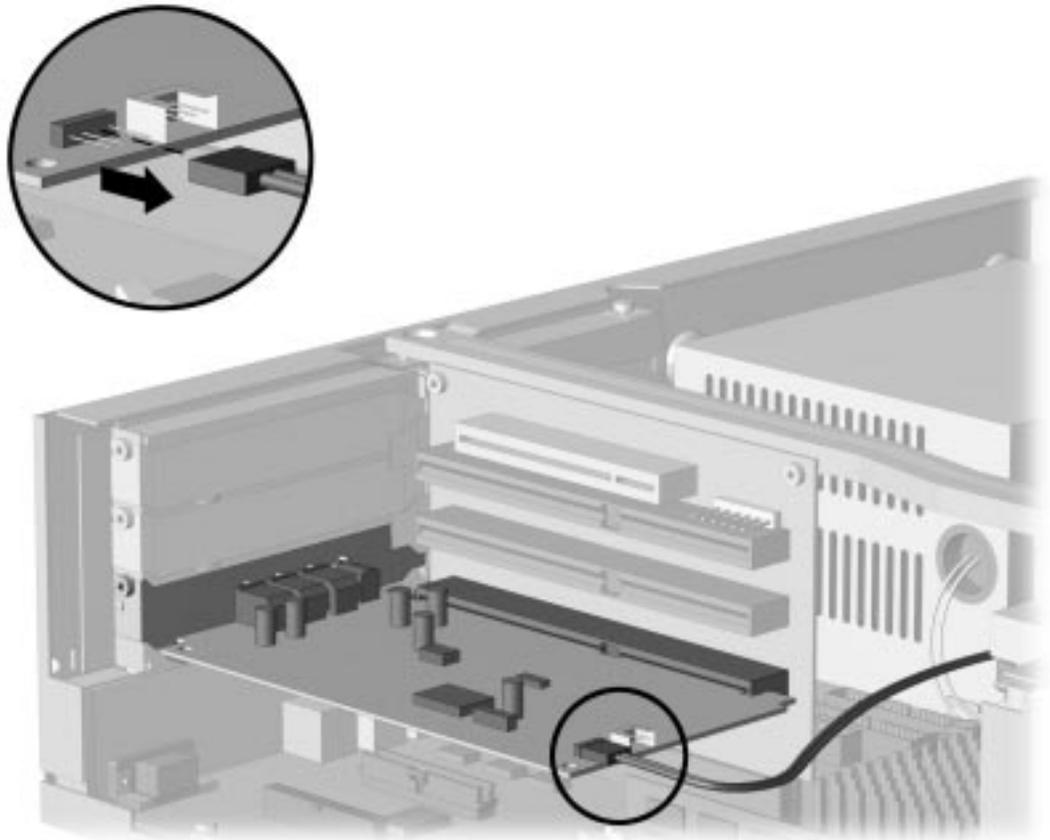
Figure 5-5. *Disconnecting the Speaker Cable from the Audio Expansion Board*

3. Unsnap the speaker-retaining clip ❶ on the right side (from the front of the chassis) of the drive bay and remove the speaker ❸.
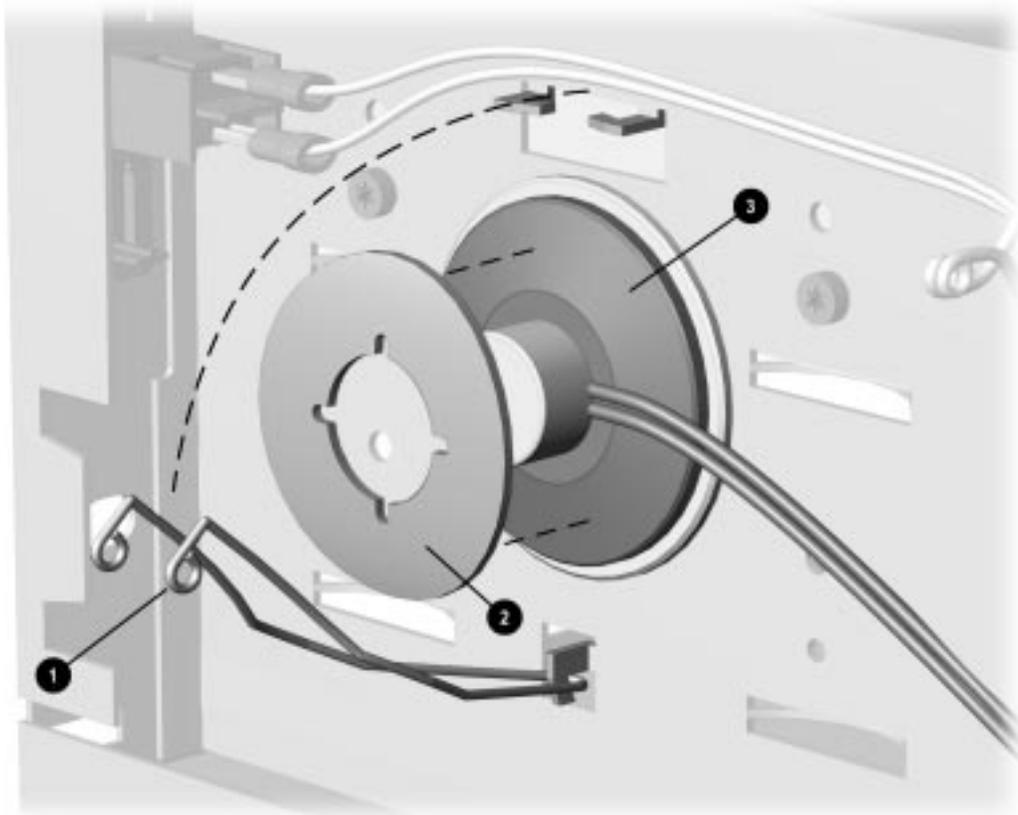
Figure 5-6. *Removing the Speaker*

To replace the speaker, ensure that the cardboard insulator ❷ is on the speaker; then, reverse the above procedure. The cable connector is keyed for proper installation.

5.8 Expansion Board

The desktop versions of the Compaq Deskpro 2000 Series of Personal Computers have five expansion slots: three on the outboard side of the riser board and two on the inboard side.
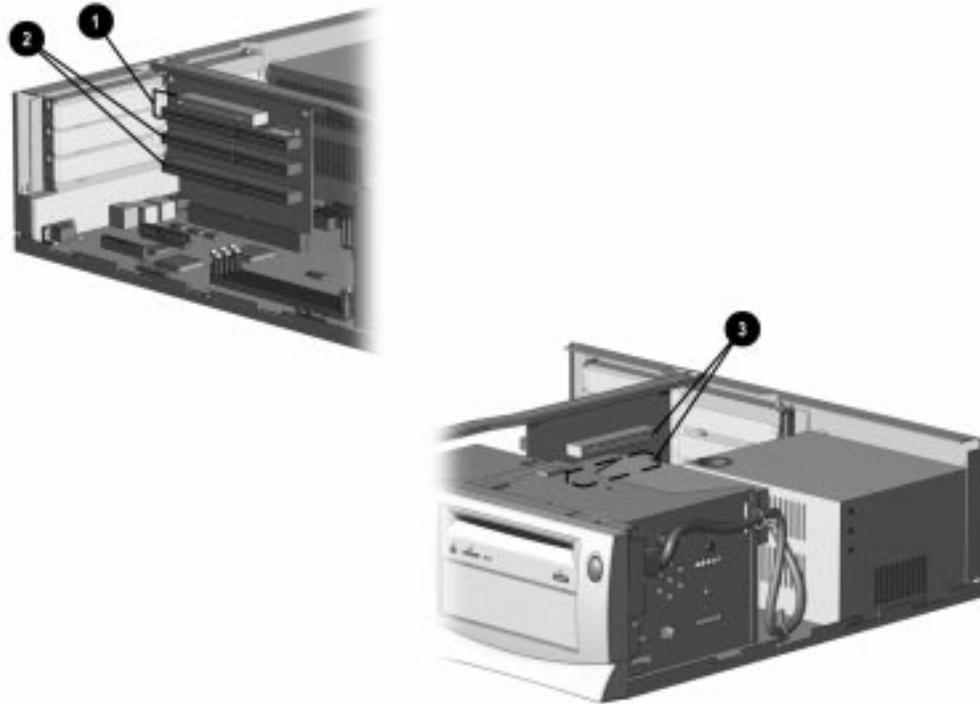
Figure 5-7. *Five Expansion Slots on the Desktop Computer*

❶ One PCI/ISA expansion slot on the outboard side of the riser board in the uppermost position.

❷ Two dedicated ISA expansion slots on the outboard side of the riser board.

❸ Two dedicated PCI expansion slots on the inboard side of the riser board.

5.8.1 Inboard Expansion Board

To remove an inboard expansion board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the retaining screw and board retainer bracket that secure the board to the rear of the computer chassis.

3. Remove the expansion board.
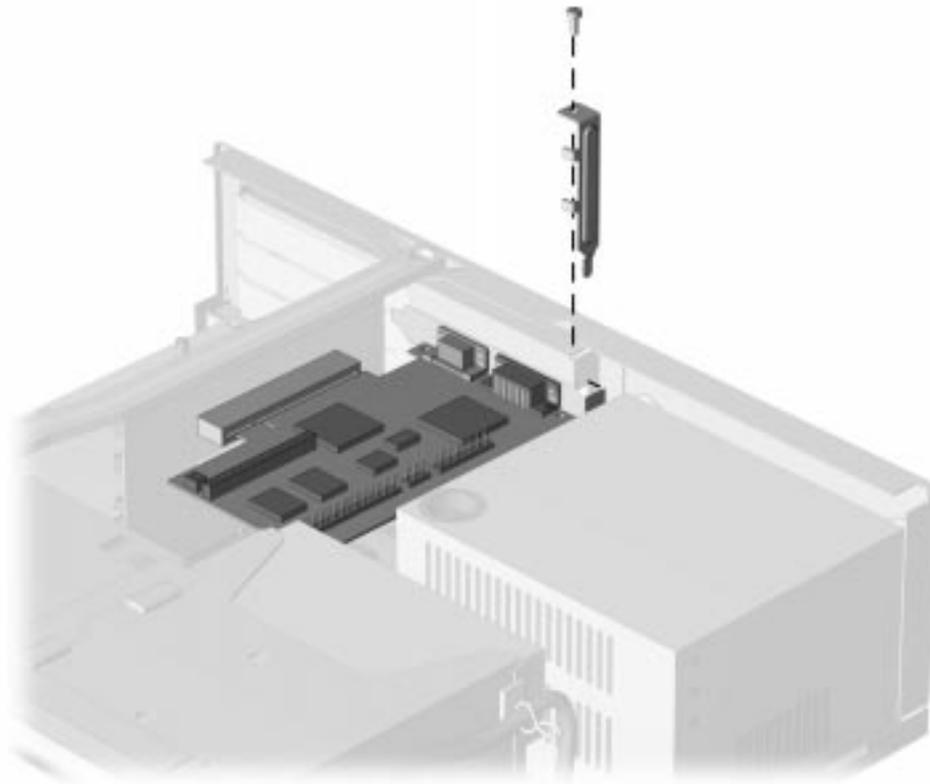
Figure 5-8. *Removing the Expansion Board from an Inboard Position*

To replace the expansion board, reverse the above procedure.

✎ If you are installing an expansion board for the first time, remove the slot cover before installing the board.

The computer should automatically recognize the added Plug and Play board.

5.8.2 Outboard Expansion Board

To remove an outboard expansion board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the retaining screw that secures the board to the rear of the computer chassis.

3. Remove the expansion board.
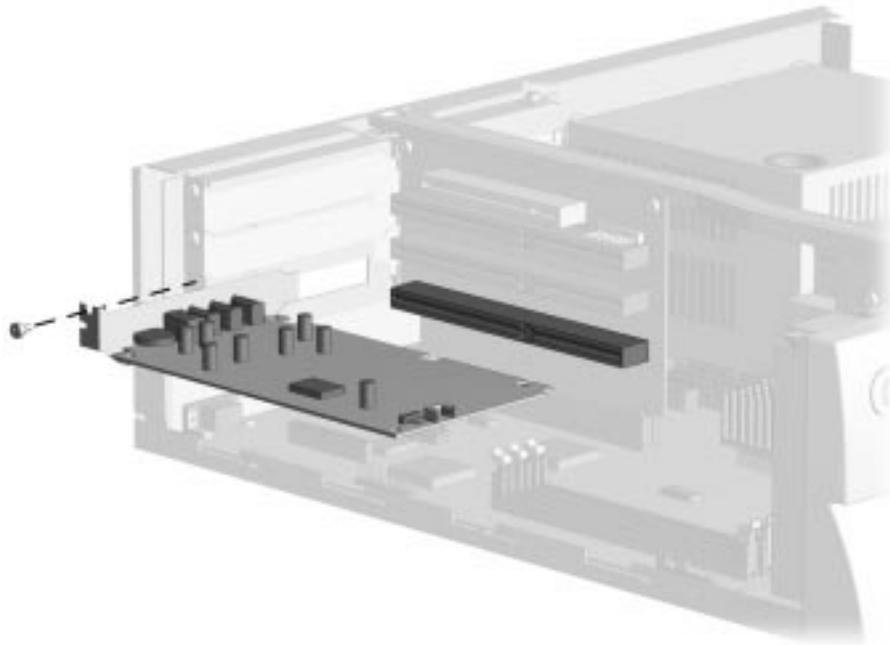
Figure 5-9. *Removing the Expansion Board from an Outboard Position*

To replace the expansion board, reverse the above procedure.

✎ If you are installing an expansion board for the first time, remove the slot cover before installing the board.

When the computer starts, it should automatically recognize the added Plug and Play board.

5.9 System Board Components

5.9.1   Memory Modules

Memory may be expanded by adding one or more DIMMs at a time onto the system board.

> ⚠ **CAUTION:** Static electricity can damage the electronic components of the computer or optional boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

> ⚠ **CAUTION:** When handling a memory module, be careful not to touch any of the contacts. Doing so can damage the module.

To remove a memory module, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove any outboard expansion boards that block the DIMM sockets (Section 5.8.2).

3. Press outward on both latches of the DIMM socket at the same time. This releases the module and partially pushes it out of the socket.

4. Lift the module from the socket.
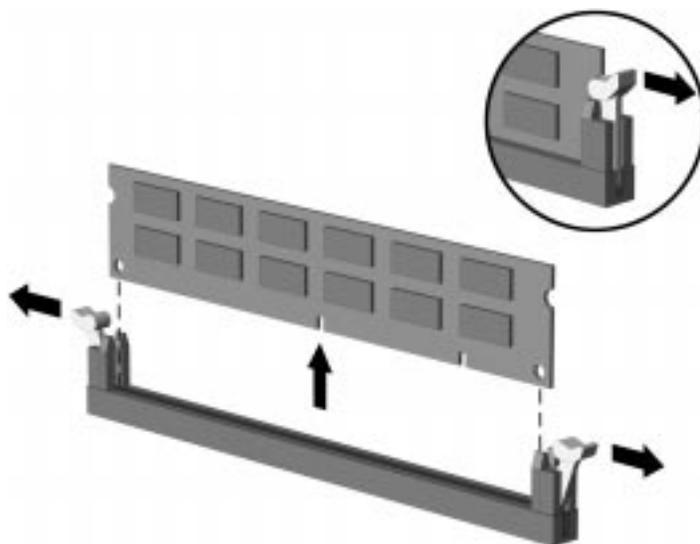
Figure 5-10. *Removing a Memory Module*

✎ For the location of the DIMM sockets on the system board, see Chapter 7.

To replace a DIMM, reverse the above steps. Press down firmly on top of the DIMM to seat it. Make sure that the latches are fully pushed in and locked.

✎ When the computer starts up, it will recognize the system memory upgrades and automatically reconfigure the computer.

5.9.2 System Board Graphics Memory Module Upgrade

To install a graphics memory module upgrade for the graphics controller that is preinstalled in the system board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove any outboard expansion boards that might block access to the memory connectors (Section 5.8.2).

3. Install the graphics memory upgrade module onto the system board.
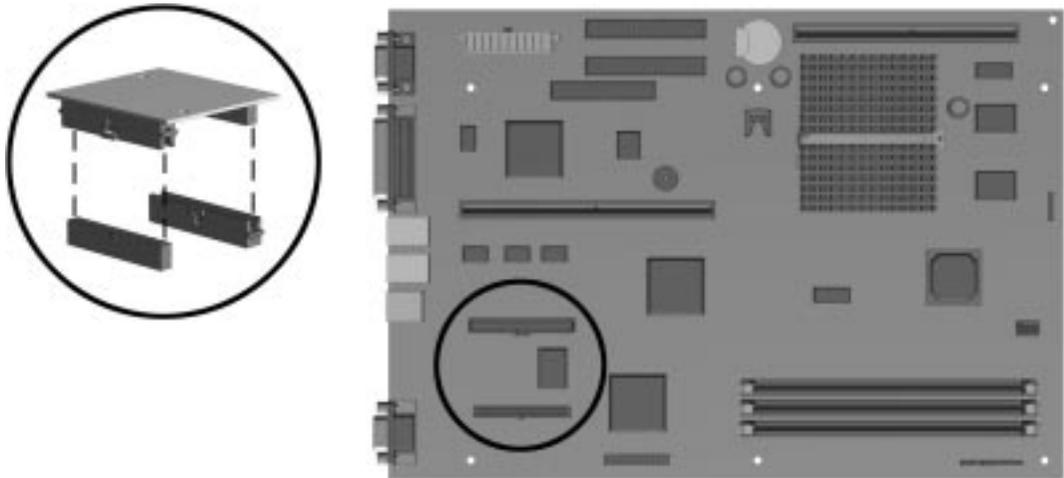
Figure 5-11. *Installing the Graphics Memory Upgrade Module on the Pentium System Board*
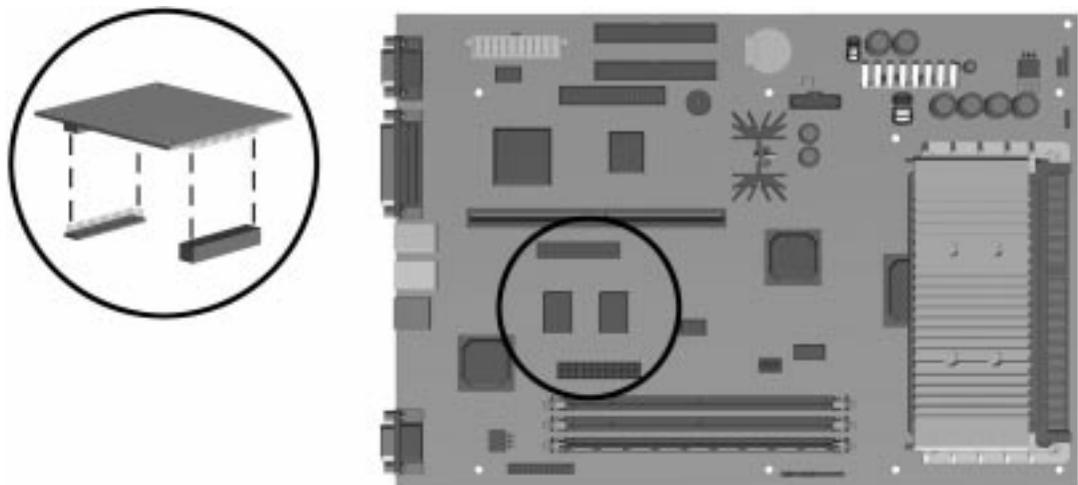
Figure 5-12. *Installing the Graphics Memory Upgrade Module on the Pentium II System Board*

4. Replace any outboard expansion boards that were removed.

5. Replace the system unit cover.

6. Turn the computer on and start Windows 95.

7. Select the display icon in Windows 95 and follow the online instructions to take advantage of the additional display modes available with the upgraded memory.

To remove, reverse the above procedure.

5.9.3   Microprocessor

Pentium System Board

To remove the microprocessor from the system board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove any expansion boards that might block access to the microprocessor (Section 5.8.1).

3. Remove the front bezel (Section 5.14.1).

4. Remove the drive cage (Section 5.17).

> ⚠ **CAUTION:** When replacing the processor, you must release the heat sink retaining clip before you pull the ZIF socket handle. The clip engages the processor socket to hold the heat sink in place.

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

5. Remove the heat sink retaining clip ❶ by pressing down on the clip's extended tab until it releases from the safety catch.

6. Lift the heat sink ❷ off the processor.

   ✎ The handle on the ZIF socket in the picture may not look identical to the one on the computer. All handle types perform the same function.

7. Release the processor from the socket by pulling the handle on the ZIF socket out and upward ❹.

8. Lift the processor ❺ out of the socket.
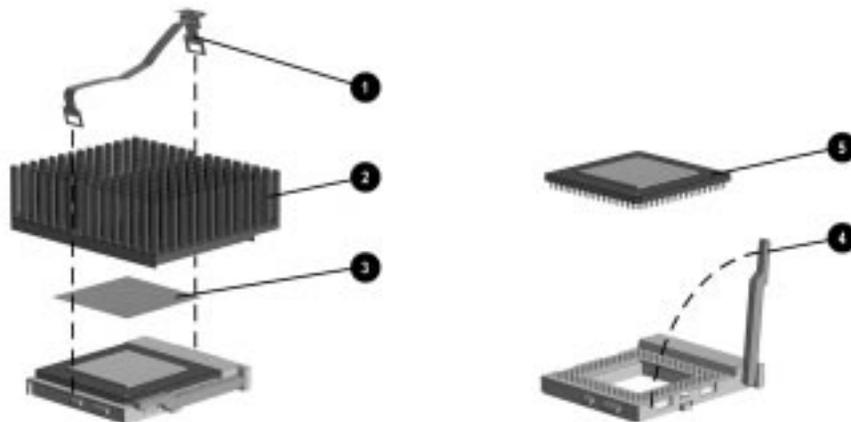
Figure 5-13. *Removing the Microprocessor from the Pentium System Board*

✎ For the location of the processor socket on the Pentium system board, see Chapter 7.

> △ **CAUTION:** When replacing the processor, be sure the clipped corner of the processor (location of pin 1) is aligned with the triangular area of the ZIF socket (marked * on the system board). Failure to do so could result in burning out both the processor and the system board.

To install the processor, complete the following steps:

1. Lower the processor ❺ into the ZIF socket. Ensure that pin 1 on the processor aligns with pin 1 on the ZIF socket.

   The location of pin 1 is indicated by a star (*) on the system board.

   ✎ The handle on the ZIF socket in the picture may not look identical to the one on the computer. All handle types perform the same function.

2. Push the ZIF handle ❹ on the ZIF socket back into place to secure the processor.

3. If the processor has a raised center, install thermal pad number 243226-001 ❸ on top of the processor before installing the heat sink.

   If the processor has a flat center, install thermal pad number 184616-002 ❸ on top of the processor before installing the heat sink.

> △ **CAUTION:** Using the wrong thermal pad may cause the processor to overheat or short, resulting in failure.

4. Install the heat sink ❷ and the heat sink retaining clip ❶.

5. Replace the drive cage.

6. Replace the front bezel.

7. Replace any expansion boards that were removed.

8. Replace the system unit cover.

Pentium II System Board

To remove the microprocessor from the Pentium II system board, complete the following steps: :

1. Remove the system unit cover (Section 5.6).

2. Remove any expansion boards that might block access to the microprocessor (Section 5.8.1 and/or 5.8.2).

3. Remove the front bezel (Section 5.14.1).

4. Remove the drive cage (Section 5.17).

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

5. Press in on the processor module release latches ❶ until they lock in the released position.

6. Pull the processor module away from the connector ❷.
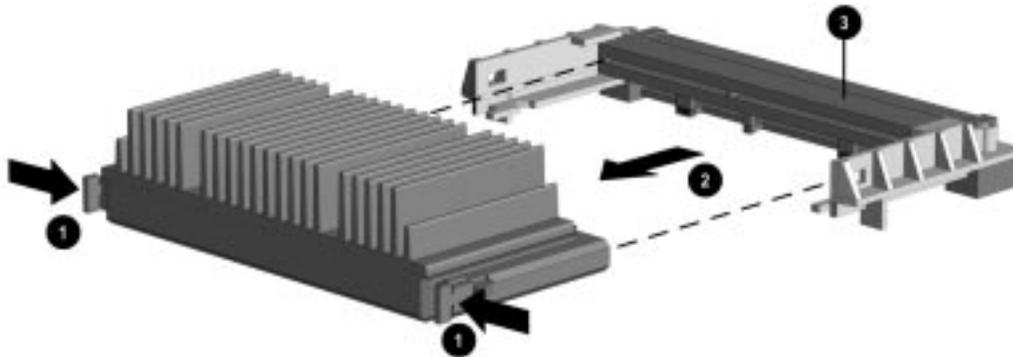
Figure 5-14. *Removing the Microprocessor from the Pentium II System Board*

✎ For the location of the processor connector on the Pentium II system board, see Chapter 7.

7. Lift the processor module to remove it from the guide rails and the machine.

To install the Pentium II processor, complete the following steps:

1. Ensure that the release latches are locked in the released position.

2. Set the Pentium II processor on the guide rails.

3. Slide the processor along the rails until it is firmly seated in the connector.

> △ **CAUTION:** Do not use the connector pins or pin guard ❸ as a handle. Even with the guard in place, the pins could bend, causing shorts that would damage the processor.

4. Pull out on the release latches until they snap into place.

5. Replace the drive cage.

6. Replace the front bezel.

7. Replace any expansion boards that were removed.

8. Replace the system unit cover.

5.9.4 Cache Memory (Pentium System Only)

To install an optional cache board onto the system board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Remove the drive cage (Section 5.17).

4. Install the cache memory board ❶ into the cache connector ❷ on the system board.

   ✎ Only use Compaq spare part number 278017-001.
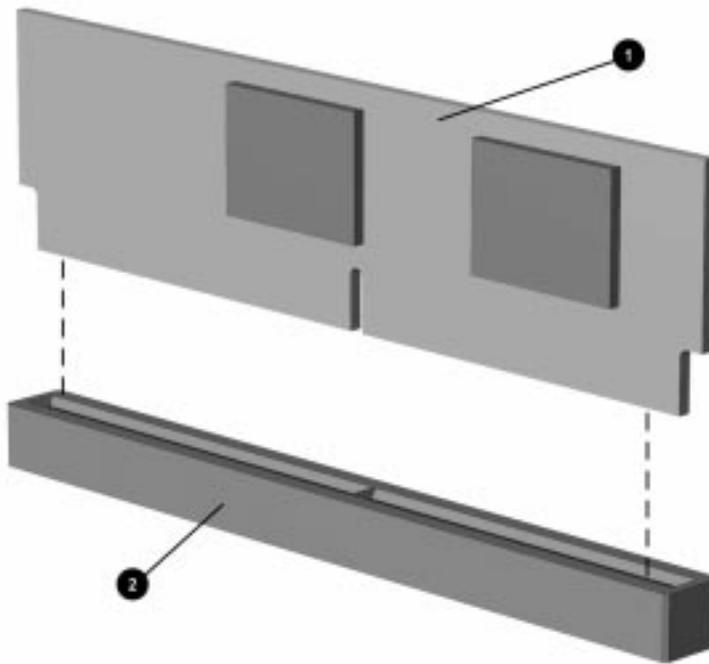
Figure 5-15. *Installing the Cache Memory Board*

✎ For the location of the cache memory socket on the Pentium system board, see Chapter 7.

5. Replace the drive cage.

6. Replace the front bezel.

7. Replace the system unit cover.

   ✎ When the computer starts up, it will recognize the cache memory upgrade and automatically reconfigure the computer.

To remove an optional cache board, reverse the above procedure.

5.10 Riser Board

To remove the riser board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

$\triangle$ **CAUTION:** Power must be off at least 30 seconds before beginning disassembly.

2. Remove all expansion boards (Section 5.8).

3. Remove the two screws that secure the riser board to the riser brace.

4. Tilt the riser board slightly away from the riser brace and pull up.
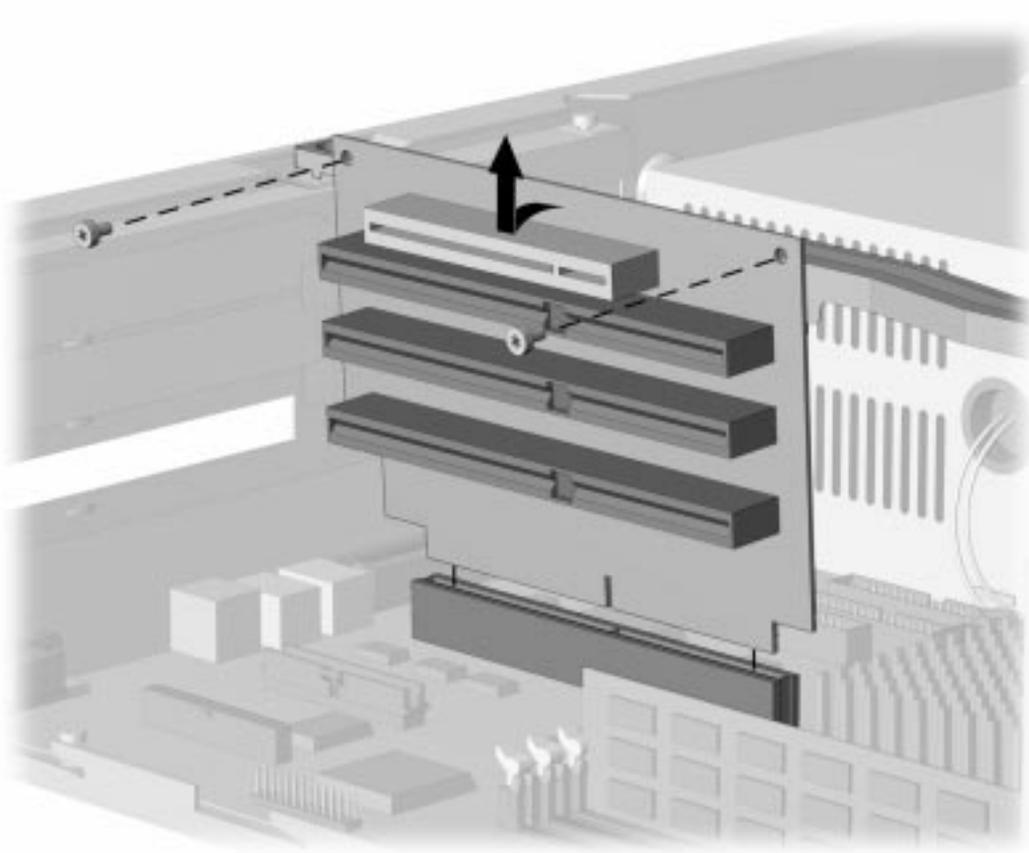
Figure 5-16. *Removing the Riser Board*

To replace the riser board, reverse the above procedure.

5.11 Riser Brace

The riser brace should only be removed from the computer if it has been damaged.

1. Remove the system unit cover (Section 5.6).

2. Remove the expansion boards (Section 5.8).

3. Remove the riser board (Section 5.10).

4. Remove the two screws that secure the riser brace to the chassis; then, lift the brace straight up.
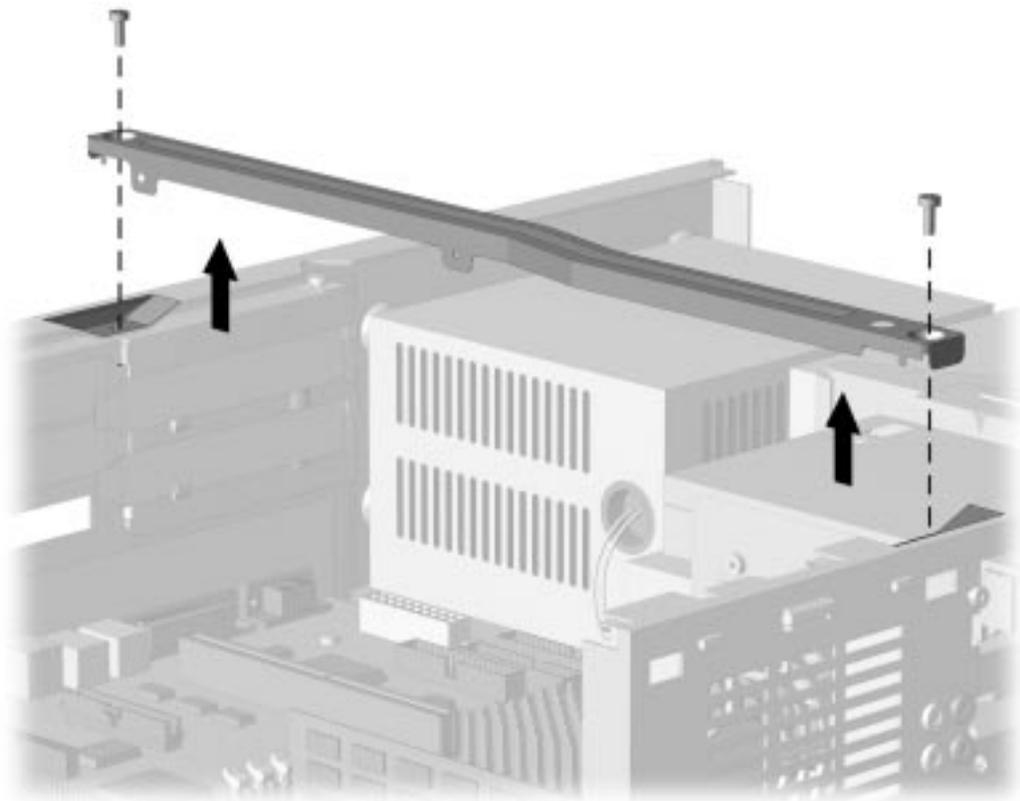
Figure 5-17. *Removing the Riser Brace*

To reinstall the riser brace, reverse the above procedure.

5.12 Expansion Board Guide

To remove the expansion board guide, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove all outboard expansion boards that may interfere with this operation (Section 5.8).

3. Push down on the plastic clip ❶ on the top of the board guide ❷ to release it; then pivot the guide down ❷ and pull it out.
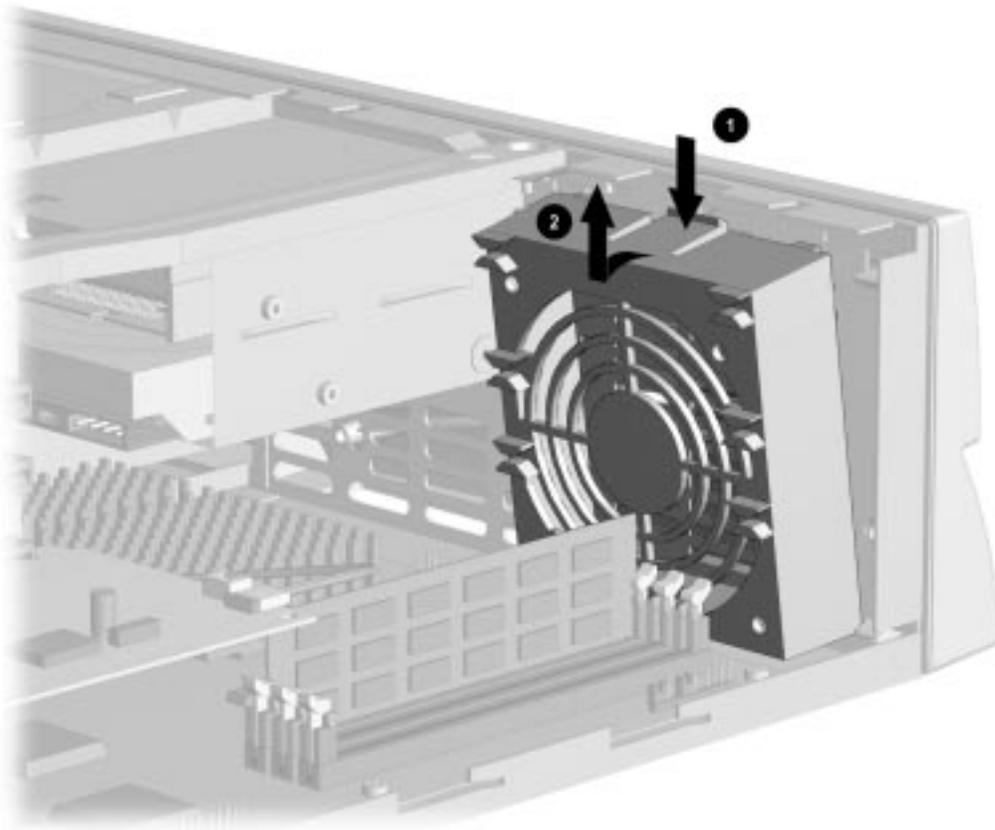
Figure 5-18. *Removing the Expansion Board Guide*

To replace the expansion board guide, reverse the above procedure. The board guides in the spares kit are keyed for proper installation.

5.13 Replacement Battery

The real-time clock battery that came with the computer is non-replaceable and is permanently installed on the system board.

> ⚠ **WARNING:** The system board contains a clock/CMOS lithium battery. The lithium battery may explode if mistreated. The battery is soldered into place and may not be removed. Do not abuse or disassemble. Use only replacement batteries supplied by Compaq Computer Corporation.

✎ It is important to make a set of backup diagnostic diskettes before you install a new battery.

To install the external real-time battery, complete the following steps::

1. Remove the system unit cover (Section 5.6).

2. Connect the new battery to the pins on the battery header connector on the system board. The battery connector is labeled "E9 Ext. Batt." on the Pentium system board and labeled "Ext. Batt." on the Pentium II system board. When this battery is connected, the internal battery is automatically disconnected.

    The battery connector is keyed for proper installation.

3. Remove the backing from the adhesive on the hook-and-loop fastener strip attached to the battery, and attach the battery as shown.
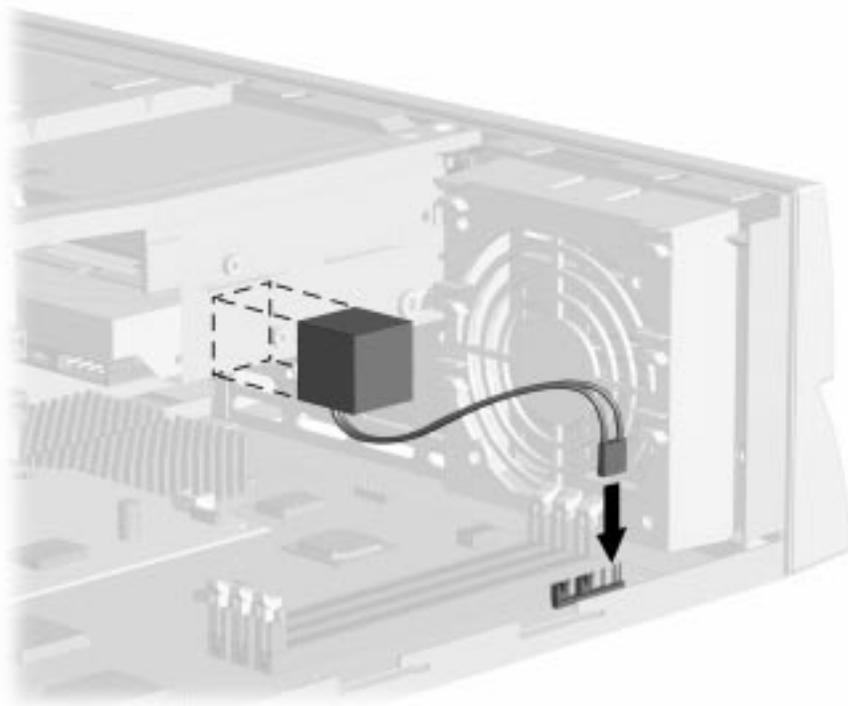
Figure 5-19. *Installing the Battery, Pentium System*
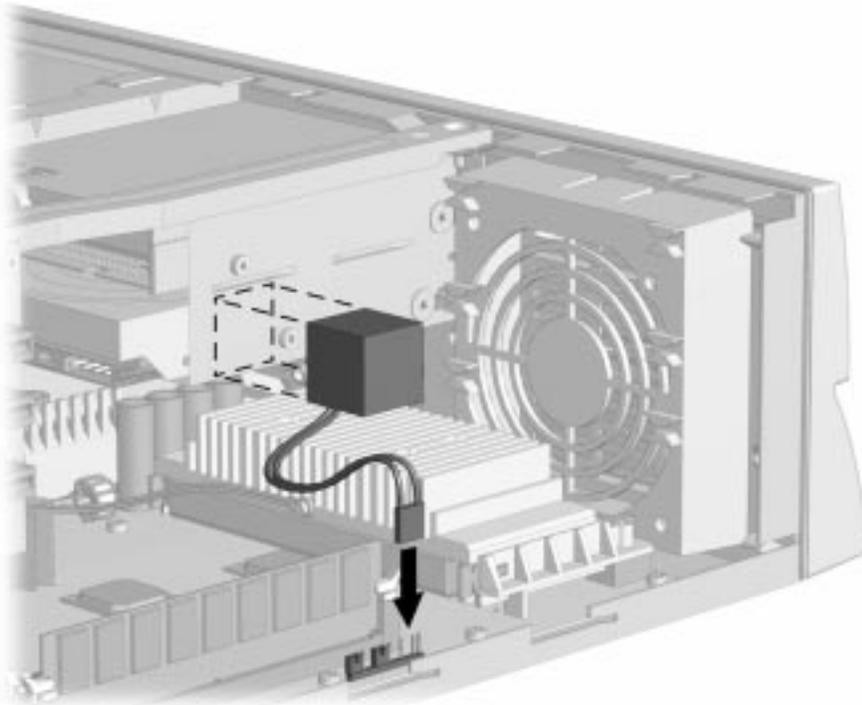
Figure 5-20. *Installing the Battery, Pentium II System*

4. Replace the system unit cover.

5. Place the sticker contained in the battery kit onto the back of the computer above the power connector.

6. Reconnect any external devices and plug in the computer.

> ⚠ **WARNING:** This equipment is designed for connection to a grounded (earthed) outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.

7. Turn on the computer.

8. Run the computer Setup utility to reconfigure the system. Refer to Chapter 2, "Compaq Utilities."

5.14 Front Bezel Assembly

The front bezel assembly consists of the front bezel, the power button, and the bezel blank.

5.14.1 Front Bezel

The front bezel must be removed from the chassis before removing or installing the power supply or any of the mass storage devices. It is attached to the computer chassis with release latches that are integrated into it. To remove the front bezel, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. From the inside of the chassis, push in the release latches ❶ and push the bottom of the bezel out ❷ and away from the chassis.

3. Slide the front bezel up to separate it from the chassis.
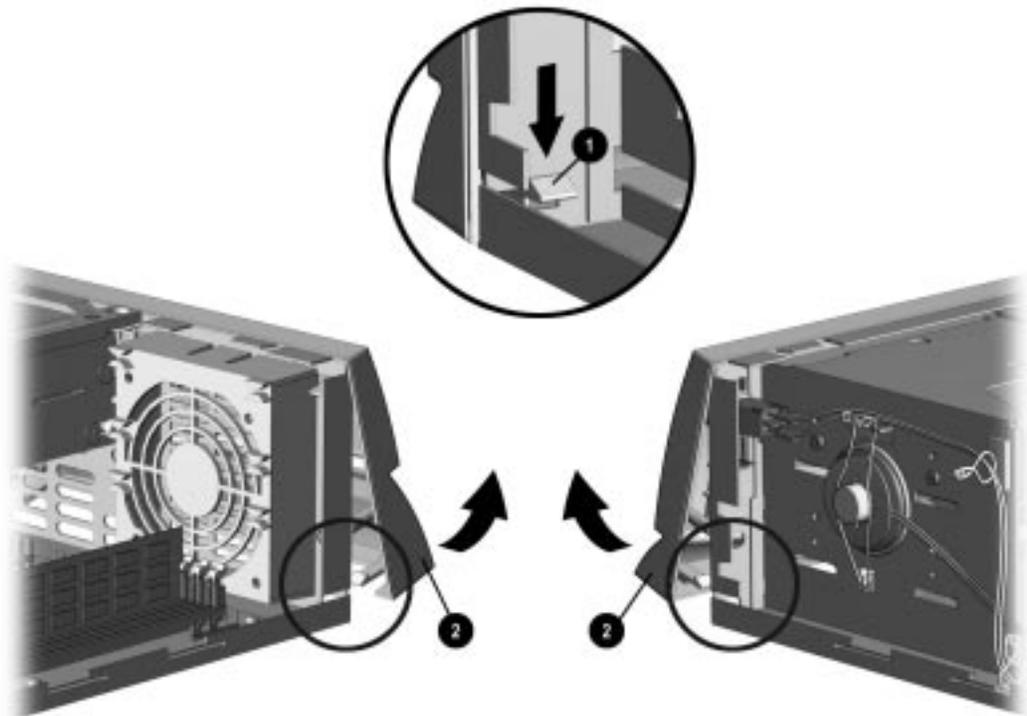
Figure 5-21. *Removing the Front Bezel*

To install the front bezel, reverse the above procedure. Ensure that the hinge points at the top of the bezel and the release latches at the bottom of the bezel are properly positioned before latching the bezel into place.

5.14.2 Power Button

To remove the power button, complete the following steps:

1. Remove the system unit cover (Section 5.6).
2. Remove the front bezel (Section 5.14.1).
3. Hold the front bezel in one hand with the inside surface towards you.
4. Pinch the two tabs of the power button together and push the button out of the front bezel. The spring will follow the button out of the housing.
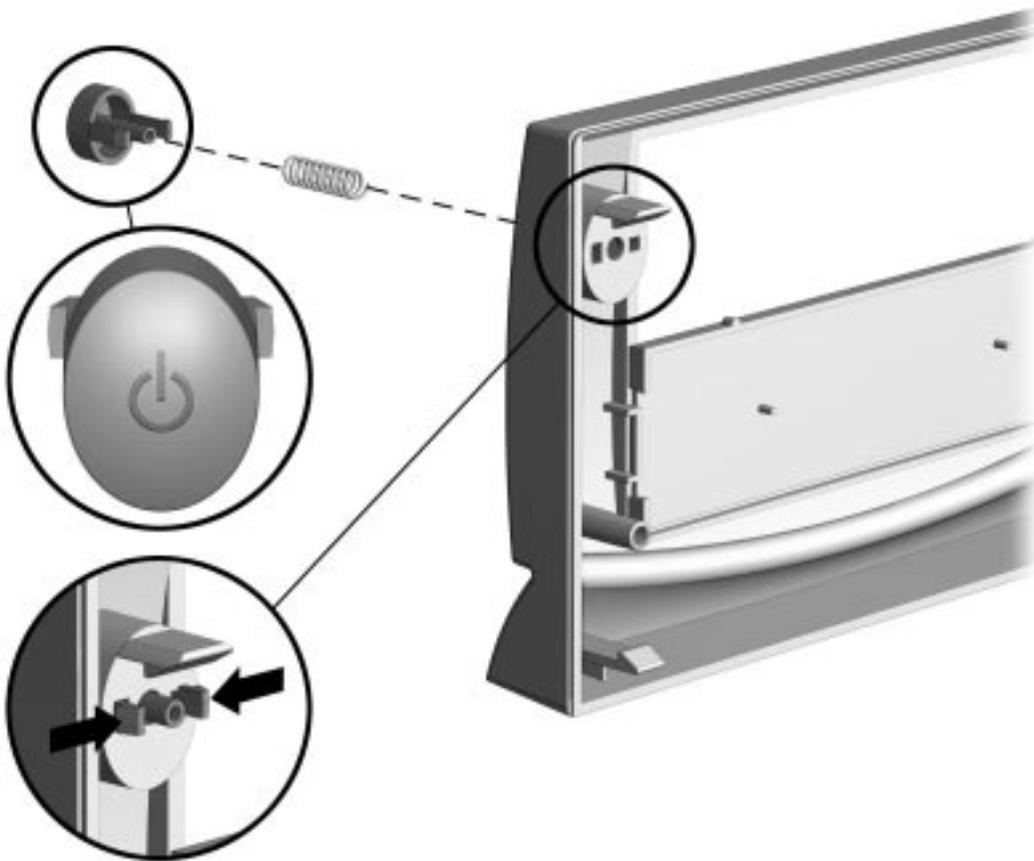
Figure 5-22. *Removing the Power Button*

To replace the power button, reverse the above procedure.

✎ When replacing the power button, be sure to use the button for a DC application as shown.

5.14.3 Bezel Blank

To remove a bezel blank, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Lay the front bezel face down on a protected work surface. Push the tab that is on the right of the bezel blank to the right.

4. Rotate the bezel blank up and out of the front bezel.
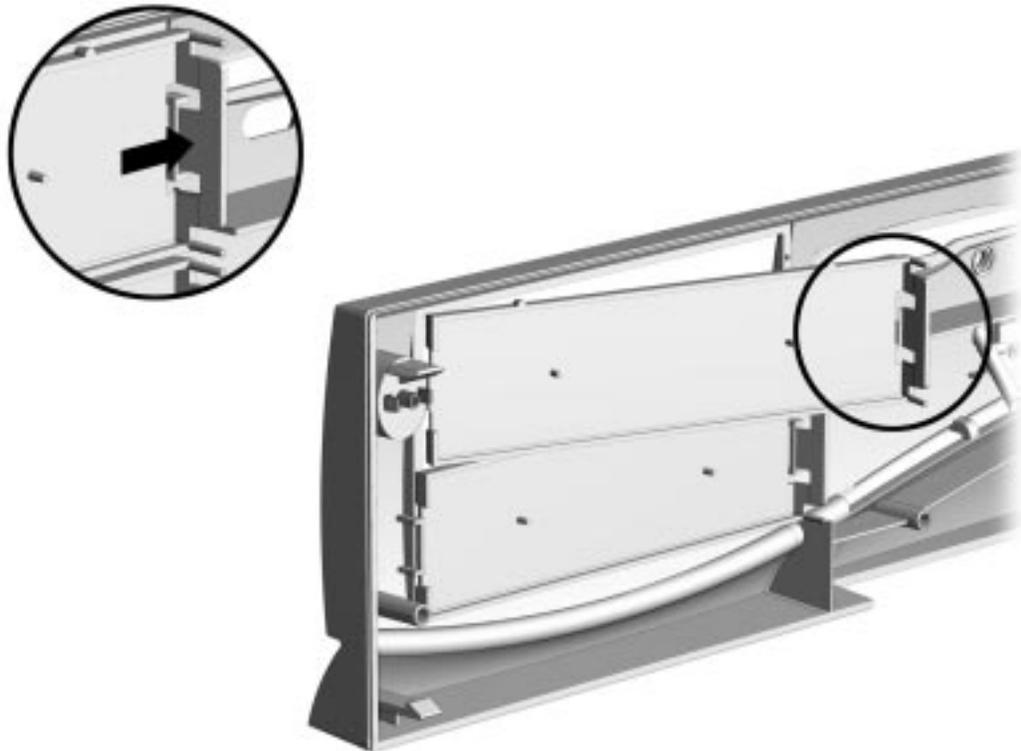
Figure 5-23. *Removing the Bezel Blank*

To reinstall the bezel blank, reverse the above procedure.

5.14.4 Compaq Logo

To remove the Compaq logo from the front bezel, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. From the inside of the front bezel, use a small screwdriver at the hole shown in the figure to push the logo out of its recess.

4. Clean the recessed area with a clean, dry cloth.

5. Remove the protective paper from the back of the replacement logo and press the logo into place.
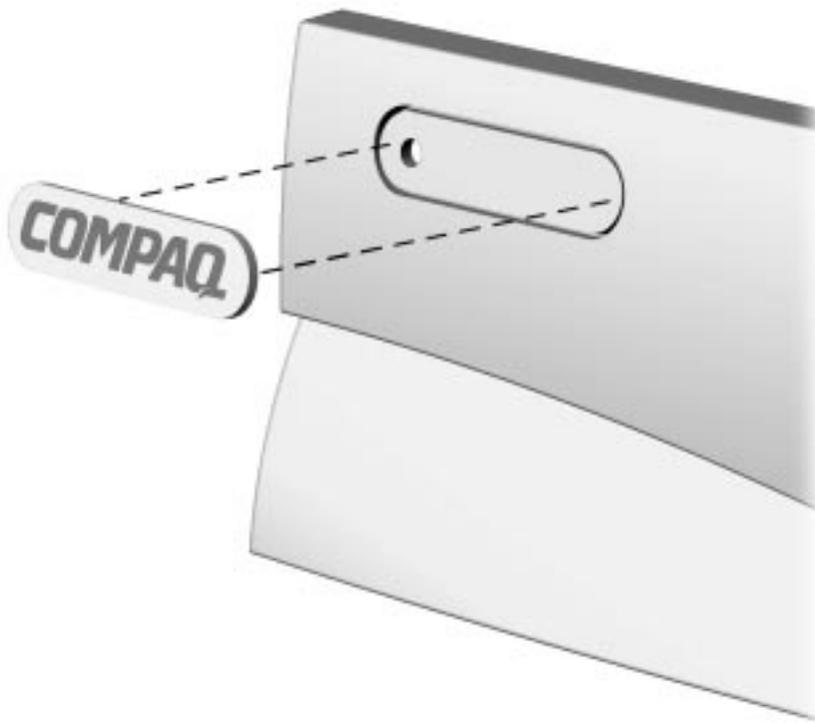
Figure 5-24. *Replacing the Compaq Logo*

If the original logo is missing, complete steps 4 and 5 to install a replacement logo without having to remove any part of the computer.

5.15   Power Supply Assembly

The power supply assembly is divided into two sections: one for the power switch assembly and one for the power supply.

5.15.1   Power Switch Assembly

To remove the power switch assembly, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Remove the plastic switch holder from the chassis. To remove the plastic switch holder from the chassis:

   ❏ Place your thumb on top of the holder ❸ and your index finger on the release tab ❶.
   ❏ Squeeze the tab toward the top of the holder.
   ❏ While squeezing the tab, push the holder down ❷ and out of the chassis.
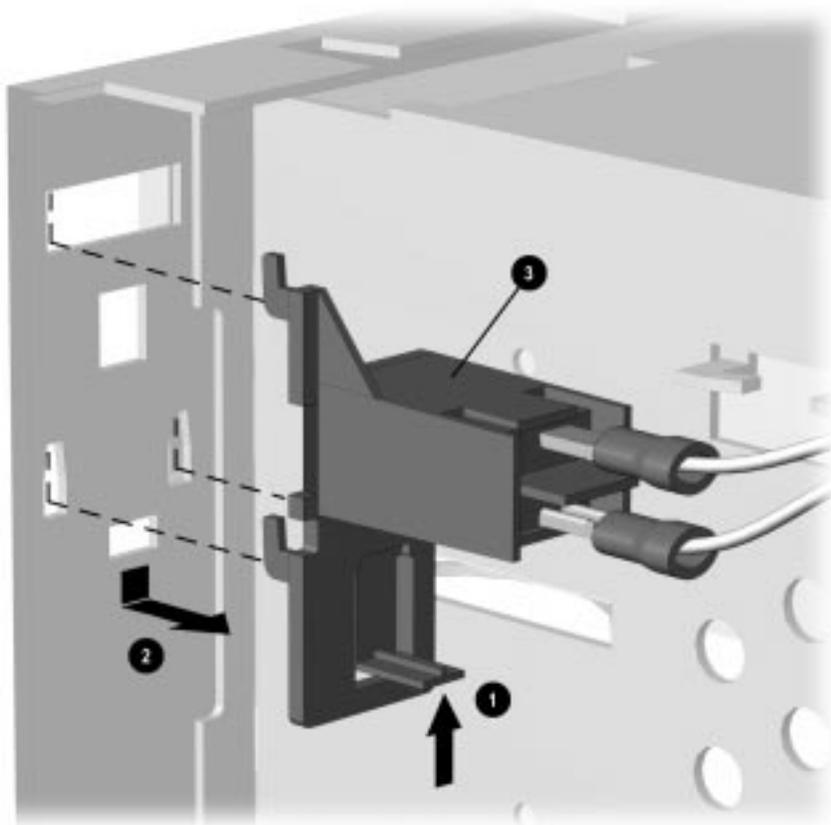
Figure 5-25. *Removing the Power Switch*

4. Remove the wires from the switch.

To install the power switch assembly, complete the following steps.

1. Install a new power switch into a new switch holder. To install the power switch into the switch holder:

    ❑ Insert the switch into the back of the holder.
    ❑ Push the switch until it snaps into place.
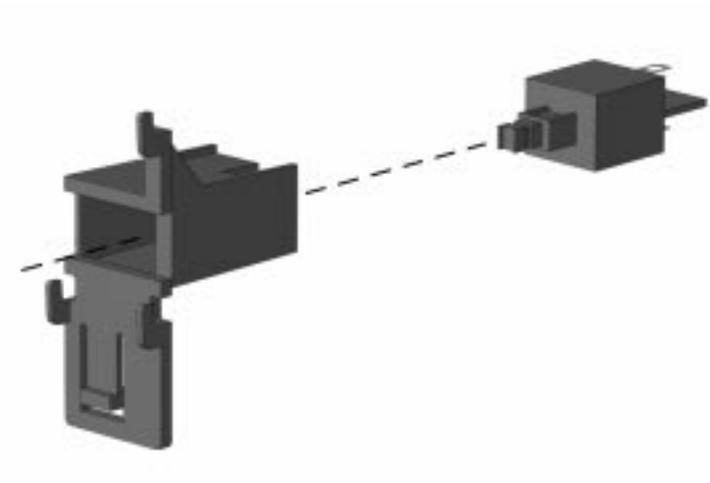
Figure 5-26. *Installing the Switch into the Holder*

2. Install the power switch assembly into the chassis. To insert the power switch assembly into the chassis:

    ❑ Insert the prongs of the switch holder into the slots in the chassis.
    ❑ Pull up on the switch holder to snap the holder into place.

3. Attach the wires to the switch.

4. Replace the front bezel (Section 5.14.1).

5. Replace the system unit cover (Section 5.6).

5.15.2 Power Supply

To remove the power supply, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Remove the power switch (Section 5.15.1).

4. Disconnect all power cables from the mass storage devices and the system board.

    ✎ All power connectors are keyed for correct installation. Note the orientation of each cable connector and the routing of the cables to facilitate reassembly.

5. Remove the three screws that secure the power supply to the back of the chassis.

6. Slide the power supply towards the front of the computer and lift up to remove it from the chassis.
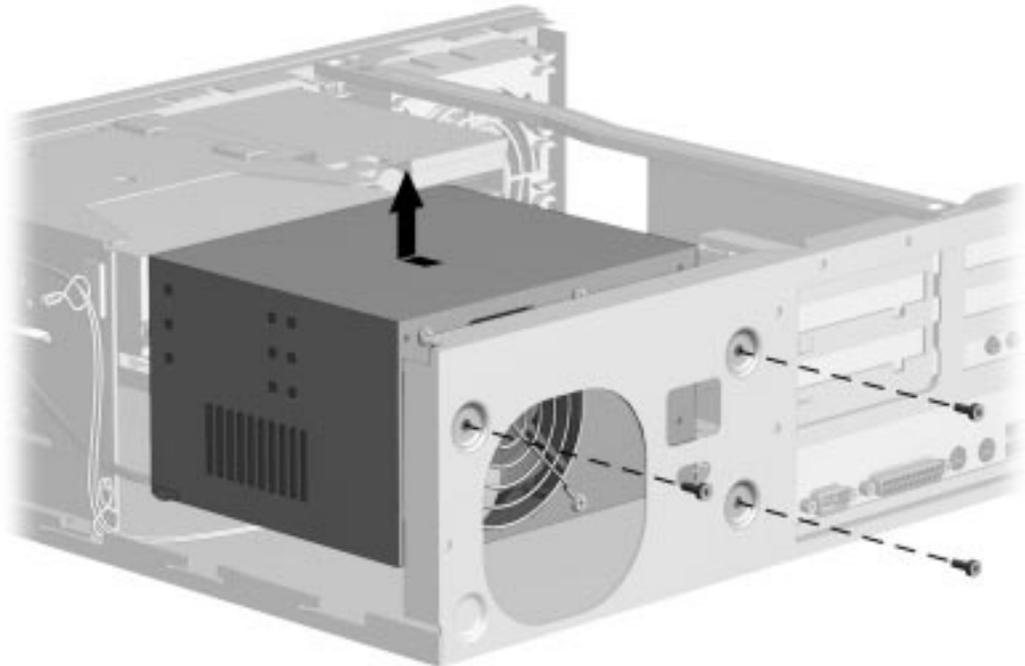
Figure 5-27. *Removing the Power Supply*

To replace the power supply, reverse the above procedure.

5.16   Mass Storage Devices

This section discusses the removal and replacement procedures for the mass storage devices that are supported on the Deskpro 2000 Series of Personal Computers. Refer to Chapter 1, Section 1.4.2, "Drive Positions."

5.16.1   3.5-Inch Drive Bays

To remove a 3.5-inch drive from either of the 3.5-inch drive bays, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Disconnect the cables from the back of the drive.
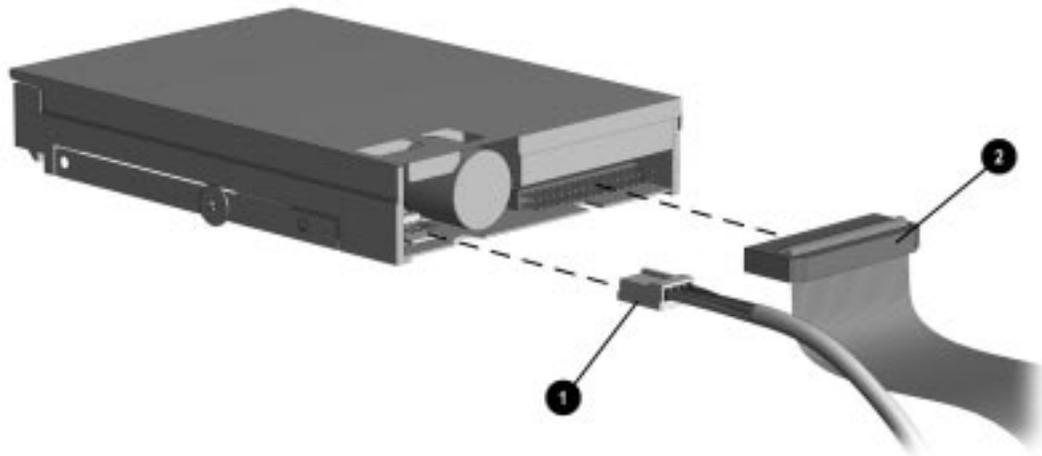
Figure 5-28. *Disconnecting the Power ❶ and Signal ❷ Cables from a 3.5-Inch Drive*

✎   When installing a second diskette drive, it is necessary to configure the computer using Computer Setup.

Refer to Chapter 7, "Jumper and Switch Information," for the location of the ribbon cable connections on the system board.

4. Remove the single screw on the left-rear of the drive that secures the drive into the chassis.

5. Pull the drive straight out of the chassis.
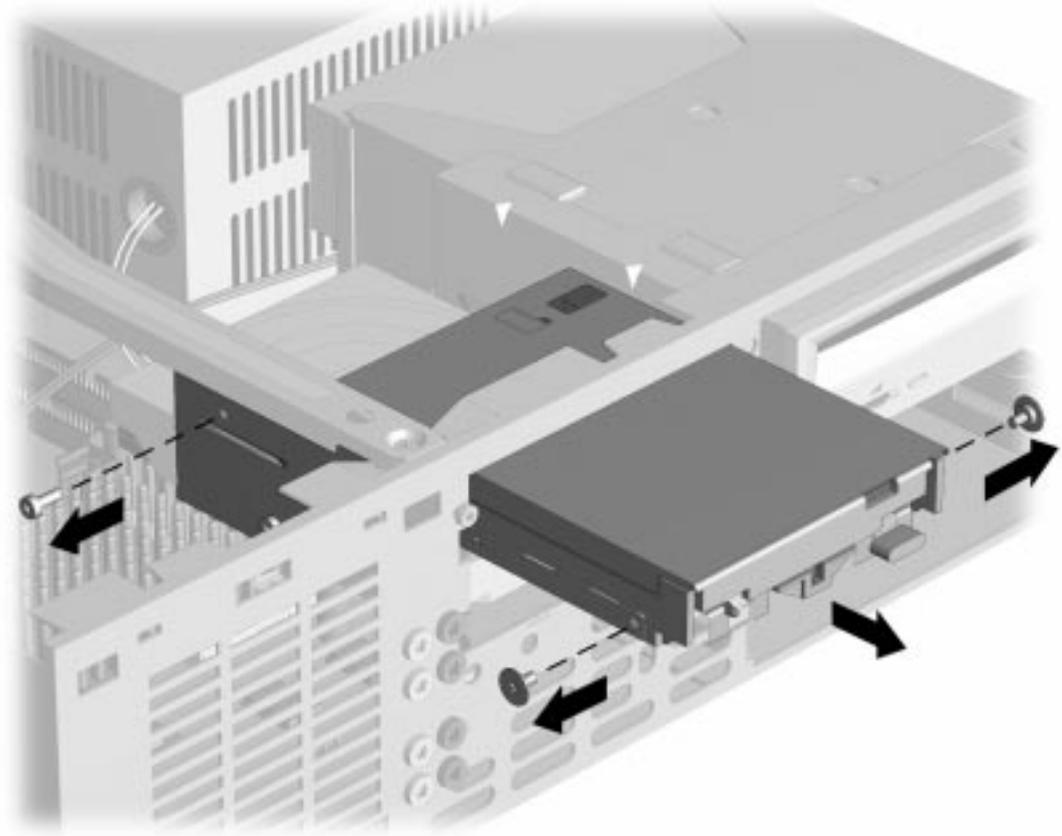
Figure 5-29. *Removing a 3.5-Inch Drive*

When replacing either of these drives, transfer the two wafer screws that take the place of drive rails from the old drive to the new one. There is one wafer screw on each side of the drive at the front.

To replace the 3.5-inch drive, reverse the above procedure.

⚠ **CAUTION:** When servicing the computer, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

⚠ **CAUTION:** Use only 3/16-inch or 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

5.16.2   5.25-Inch Drive Bays

The 5.25-inch drive bays may be occupied by diskette drives, hard drives, CD-ROM drives, PD-CD drives, LS-120 drives, or tape drives. Removal of a CD-ROM drive is shown.

> ⚠ **CAUTION:** All removable media should be taken out of the drives before removing the drive from the computer.

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Disconnect the cables from the back of the drive.
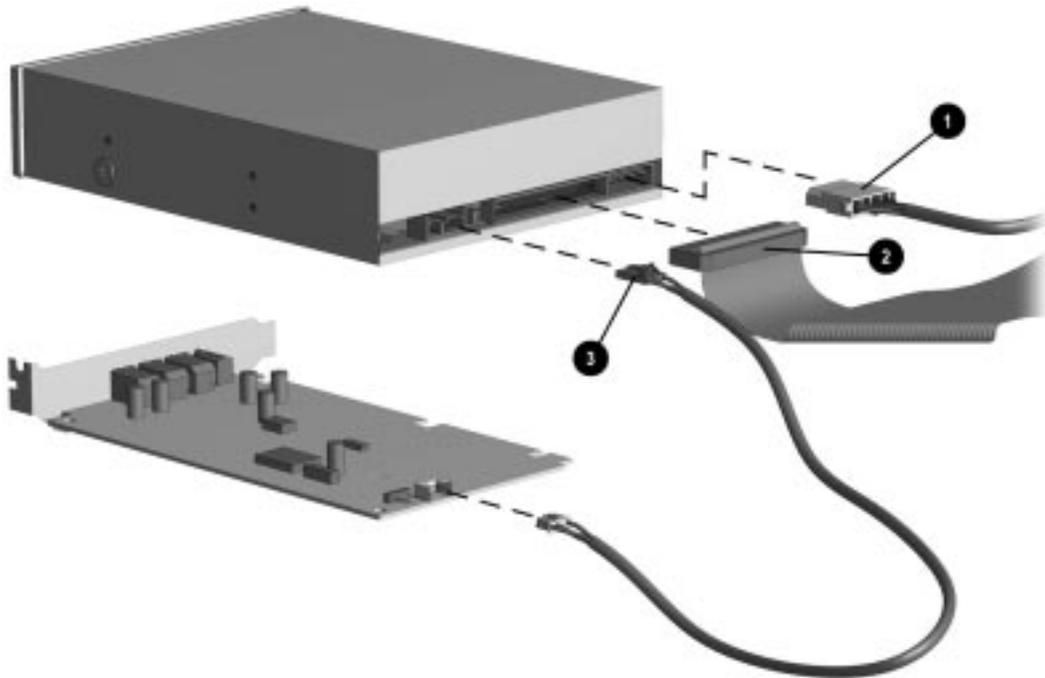
Figure 5-30. *Disconnecting the Power* ❶, *the Signal* ❷, *and the Audio* ❸ *Cables from a CD-ROM Drive and an Optional Audio Board*

4. Remove the two screws on the right side of the drive bay that secure the drive to the chassis.

5. Pull the drive straight out of the chassis.
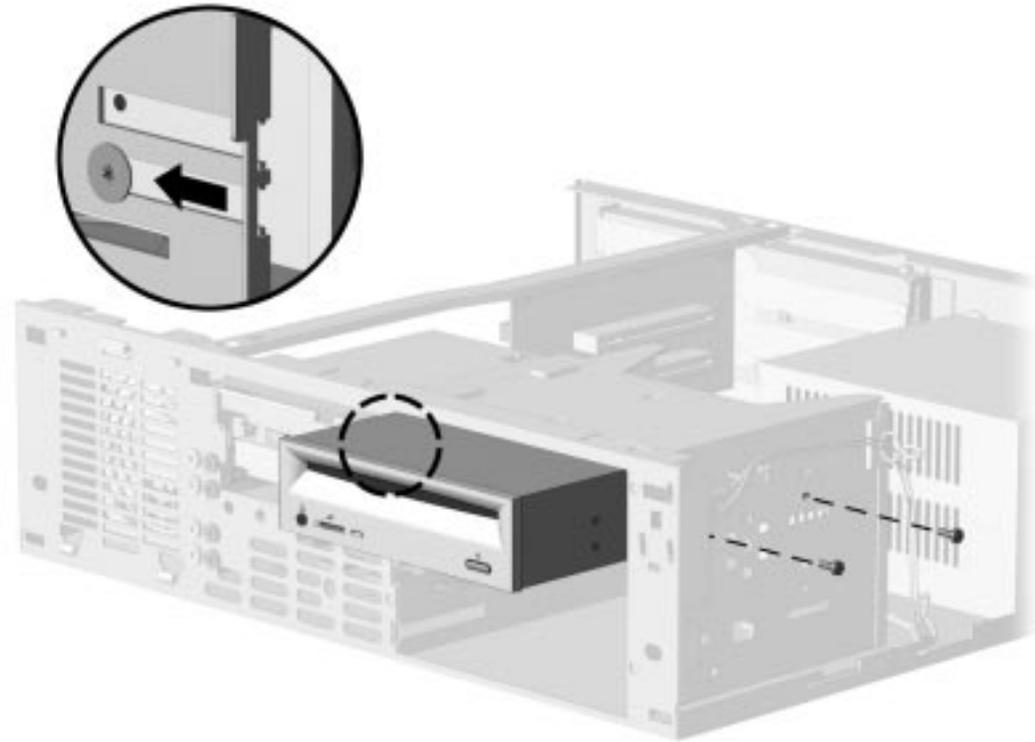
Figure 5-31. *Removing the CD-ROM Drive*

When replacing this drive, transfer the single wafer screw that takes the place of drive rails from the old drive to the new one. The wafer screw is on the left side of the drive at the front.

To replace the 5.25-inch drive, reverse the above procedures.

✎ When installing a second diskette drive, it is necessary to configure the computer using Computer Setup.

5.16.3   Installing a New Drive

When installing a new drive, you should use either the wafer screws provided in the option kit or the extra U.S. or metric screws, both of which types are stored in the front of the computer chassis for this purpose. The same screws that are used as guide screws are used as retainer screws to secure the drive in the drive bay. Select the appropriate screws for the application.

✎   Metric screws have a black finish while U.S. screws have a silver finish.
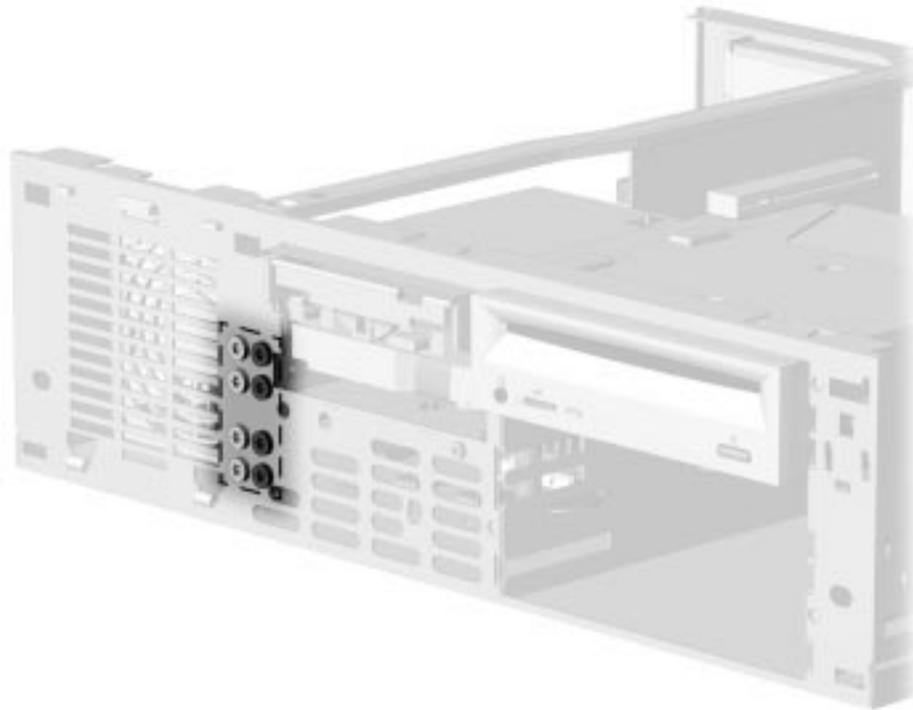
Figure 5-32. *Locating the Mounting Screws*

If you are installing a 3.5-inch diskette drive into a 5.25-inch drive bay, use Compaq bracket spare part number 243230-001, which comes with a preinstalled bezel.

If you are installing a 3.5-inch hard drive into a 5.25-inch drive bay, use Compaq bracket spare part number 243231-001.

To install a 3.5-inch drive/bracket assembly, begin with step 1.

To install a 5.25-inch drive, begin with step 3.

1. Place the 3.5-inch drive into the bracket.

2. Insert two screws into the bracket holes on each side of the bracket to secure the drive.
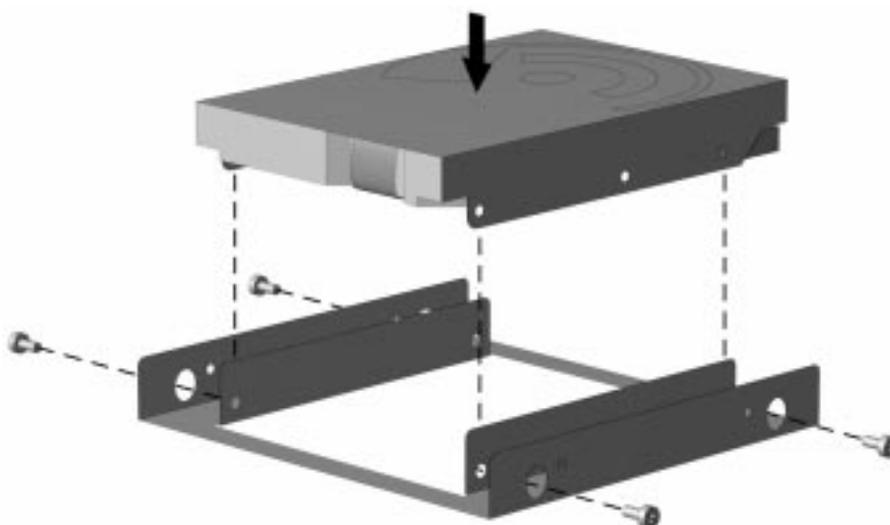
Figure 5-33. *Installing the Hard Drive into the Mounting Bracket*

⚠ **CAUTION:** Use only 3/16-inch or 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

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3. Install one wafer screw on the left side of the drive or bracket assembly. This acts as a guide rail to align the bracket in the drive bay.

Figure 5-34. *Inserting the Wafer Screw on the Left Side of the Bracket*

4. Install the drive assembly into the drive bay. Ensure that the guide screw fits into the tab on the left side of the bay.

5. Secure the drive with two wafer screws on the right side of the drive bay.
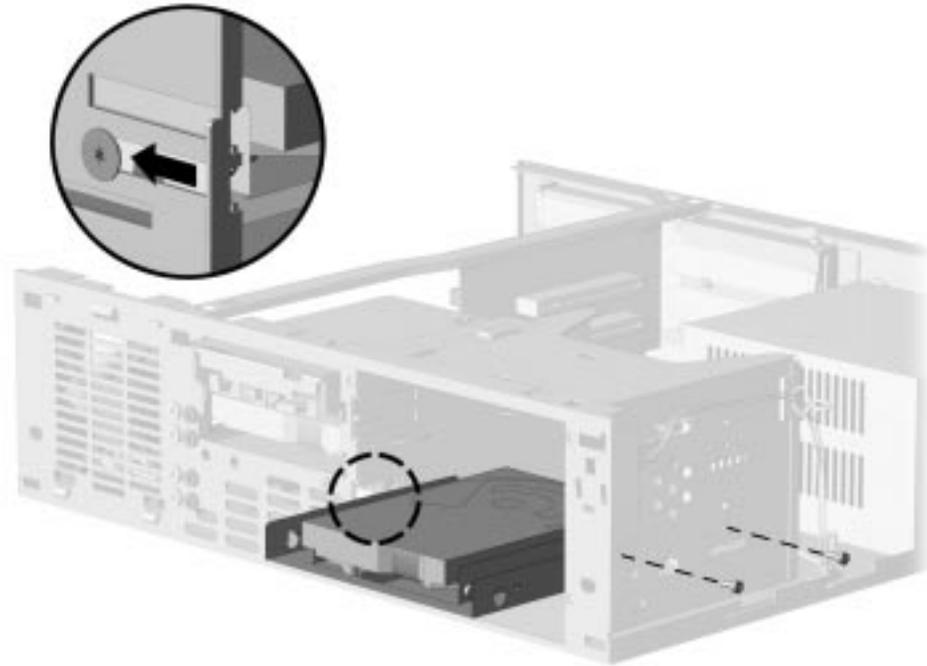
Figure 5-35. *Installing the Hard Drive/Bracket Assembly and Securing It with Two Wafer Screws*

6. Connect the drive cables. Refer to Section 5.16.1 for a 3.5-inch drive and paragraph 5.16.2 for a CD-ROM.

7. Remove the bezel blank from the front bezel if necessary (Section 5.14.3).

8. Install the front bezel (Section 5.14.1).

9. Install the system unit cover (Section 5.6).

10. The system will automatically recognize a hard drive sold by Compaq or any other Plug and Play hard drives and will automatically reconfigure the computer.

   If you have installed a third-party hard drive that is not a Plug and Play device, you will need to run Computer Setup to reconfigure the computer. Refer to Chapter 2, "Compaq Utilities," for information on running Computer Setup.

5.17   Drive Cage

To remove the drive cage from the computer chassis, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the front bezel (Section 5.14.1).

3. Remove the three screws that secure the drive cage to the chassis.

4. Slide the drive cage back towards the inside of the chassis to release the latches.

5. Lift the assembly up to remove it from the chassis.
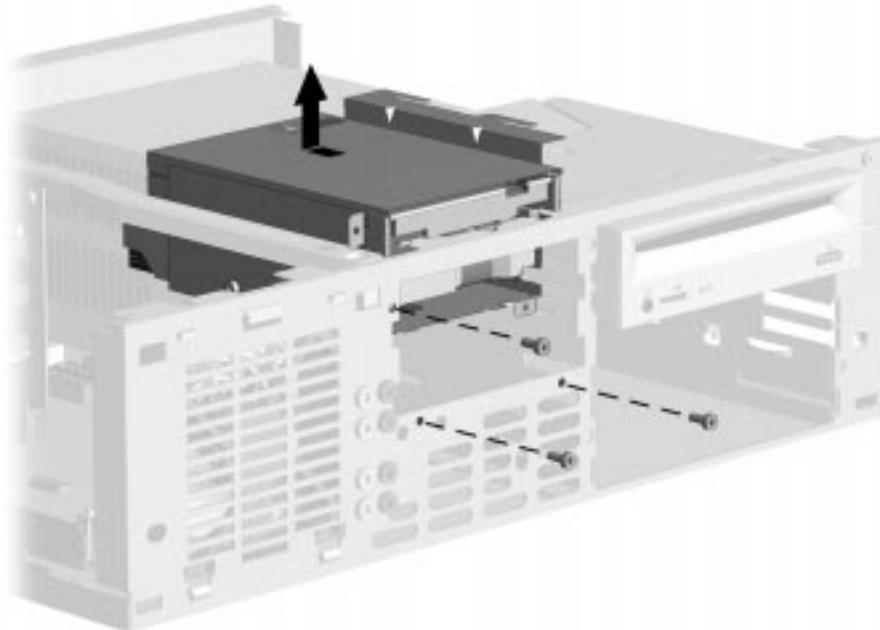
Figure 5-36. *Removing the Drive Cage*

To replace the drive cage, reverse the above procedure.

> △ **CAUTION:**   When replacing the drive cage, be careful that the LED cable does not get caught, pinched, or otherwise damaged.

5.18   LED Cable

To remove the LED cable, complete the following steps::

1. Remove the system unit cover (Section 5.6).
2. Remove the front bezel (Section 5.14.1).
3. Remove the drive cage (Section 5.17).
4. Disconnect the LED cable from the system board ❶.
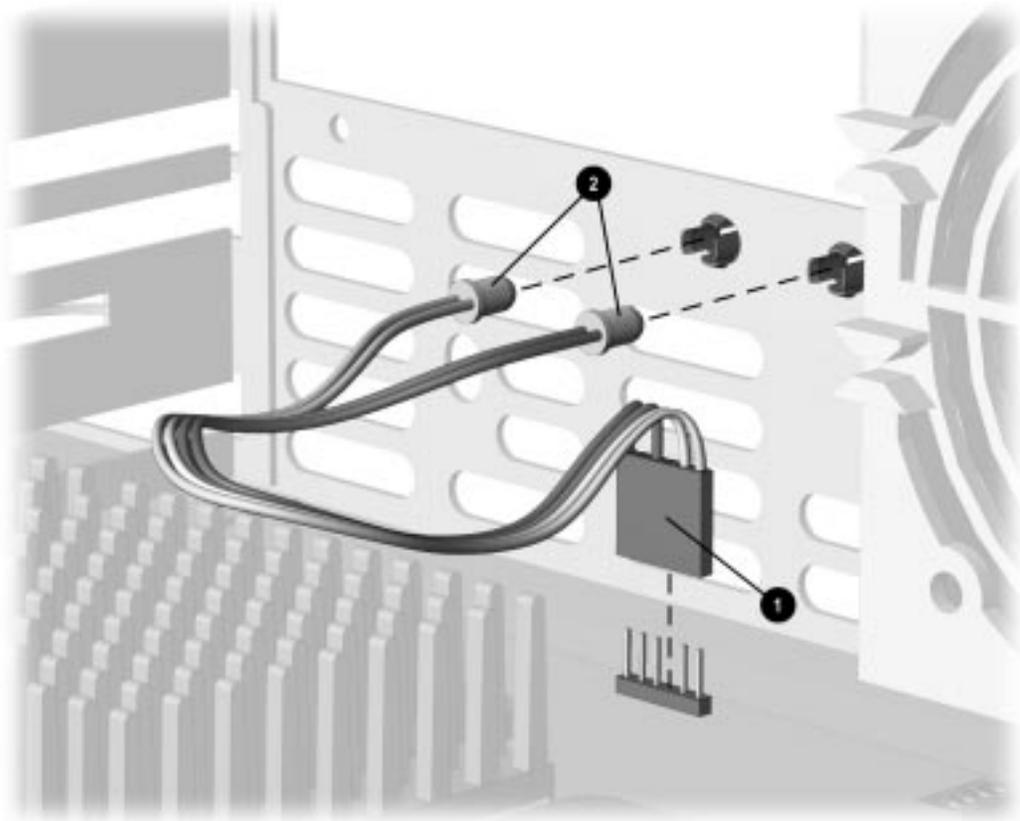
Figure 5-37. *Removing the LED Cable, Pentium System*
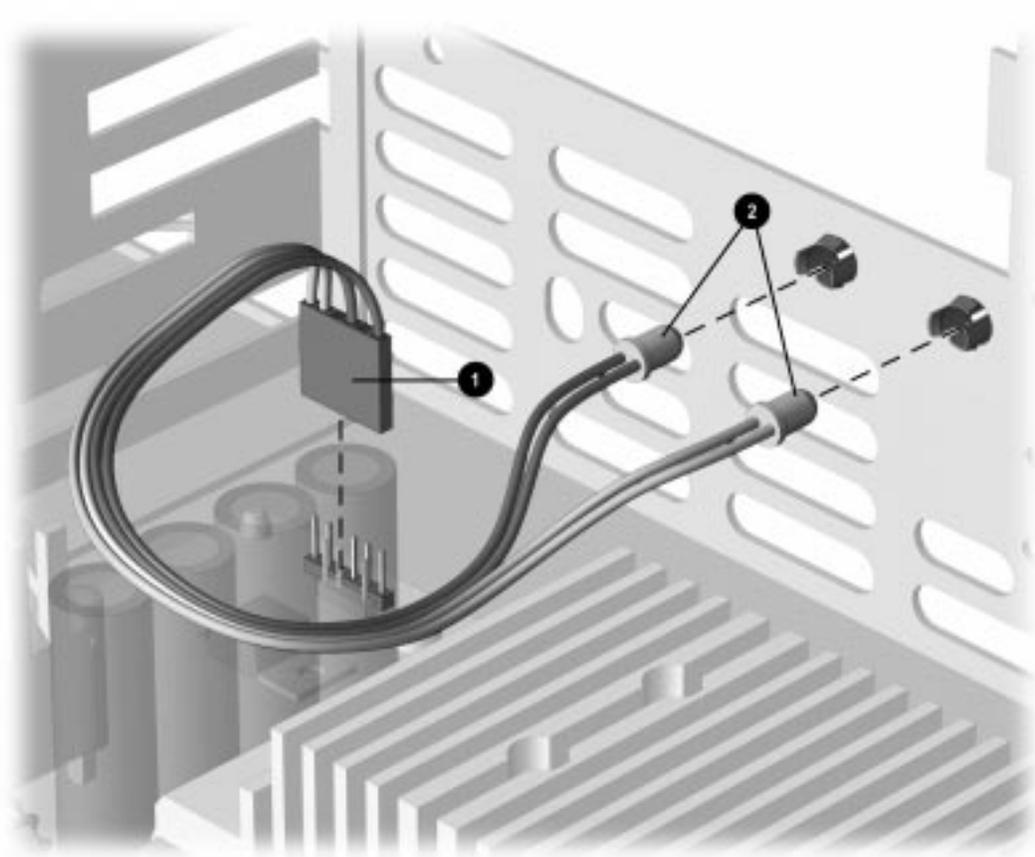
Figure 5-38. *Removing the LED Cable, Pentium II System*

5. Remove the LED ends ❷ of the cable from the front of the chassis by gently pulling on the cable while at the same time pushing the ends of the LED from the front of the chassis.

To install the LED cable, reverse the above steps. The connector ❶ is keyed to ensure proper installation.

✎ When reinstalling the LED ends, note the markings on the front of the chassis for proper LED placement. From the front of the chassis, the LED with the black wire goes on the left, and the LED with the white wire on the right.

⚠ **CAUTION:** Ensure that the cable is pushed to the bottom of the chassis to avoid being damaged when reinstalling the drive cage.

5.19 System Board

To remove the system board, complete the following steps:

1. Remove the system unit cover (Section 5.6).

2. Remove the expansion boards (Section 5-8).

3. Remove the riser board (Section 5.10).

   ✎ It is not necessary to remove the riser brace in order to remove the system board.

   If a replacement external battery is installed on the system board, do not unplug the battery from the system board connector as that will erase the CMOS. Remove the external battery from the hook-and-loop fastener on the chassis but leave it electrically connected to the system board.

4. Disconnect any cables plugged into the system board.

5. Remove the front bezel (section 5.14.1).

6. Remove the drive cage (Section 5.17).

7. Remove the screws securing the system board to the chassis.

   ❏ Five screws secure Pentium system board.
   ❏ Seven screws secure Pentium II system board.

8. Use your fingers to grip the system board at the guide pin ❶ area and pull up on the board to release it from the pin.

> ⚠️ **CAUTION:** Do not use any tools to release the board from the pin. Doing so may damage the system board electronically.

9. To remove the board from the chassis ❷, move the board slightly toward the front of the chassis and lift up and out.
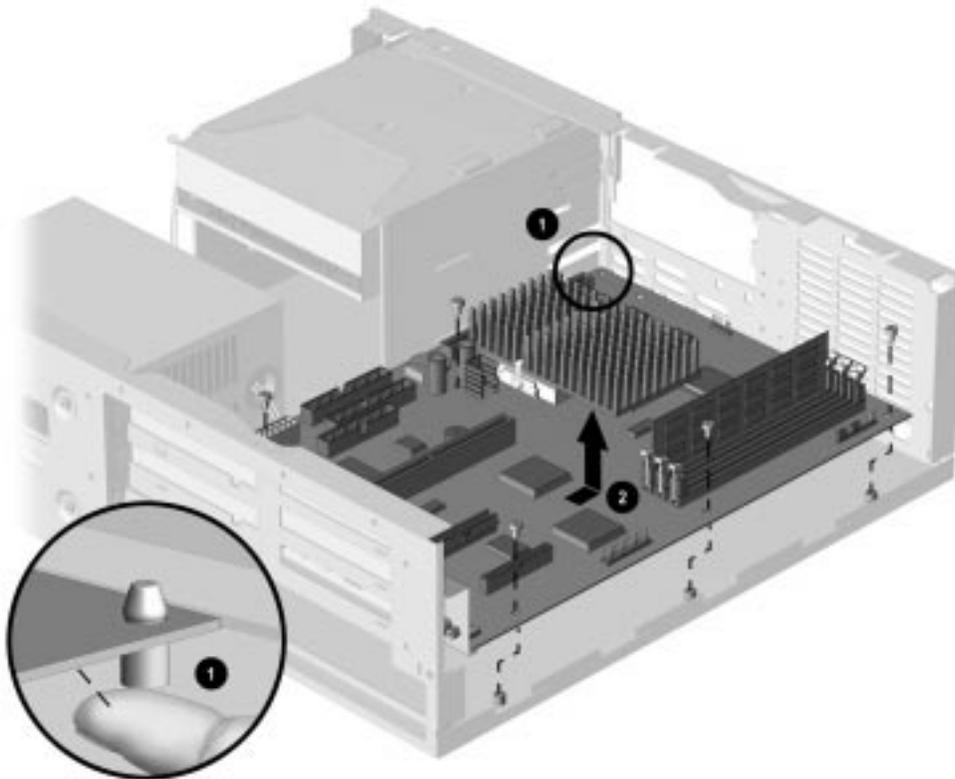
Figure 5-39. *Removing the Pentium System Board*

✎ The riser brace has been removed for clarity.

To install a new system board, reverse the above procedures.
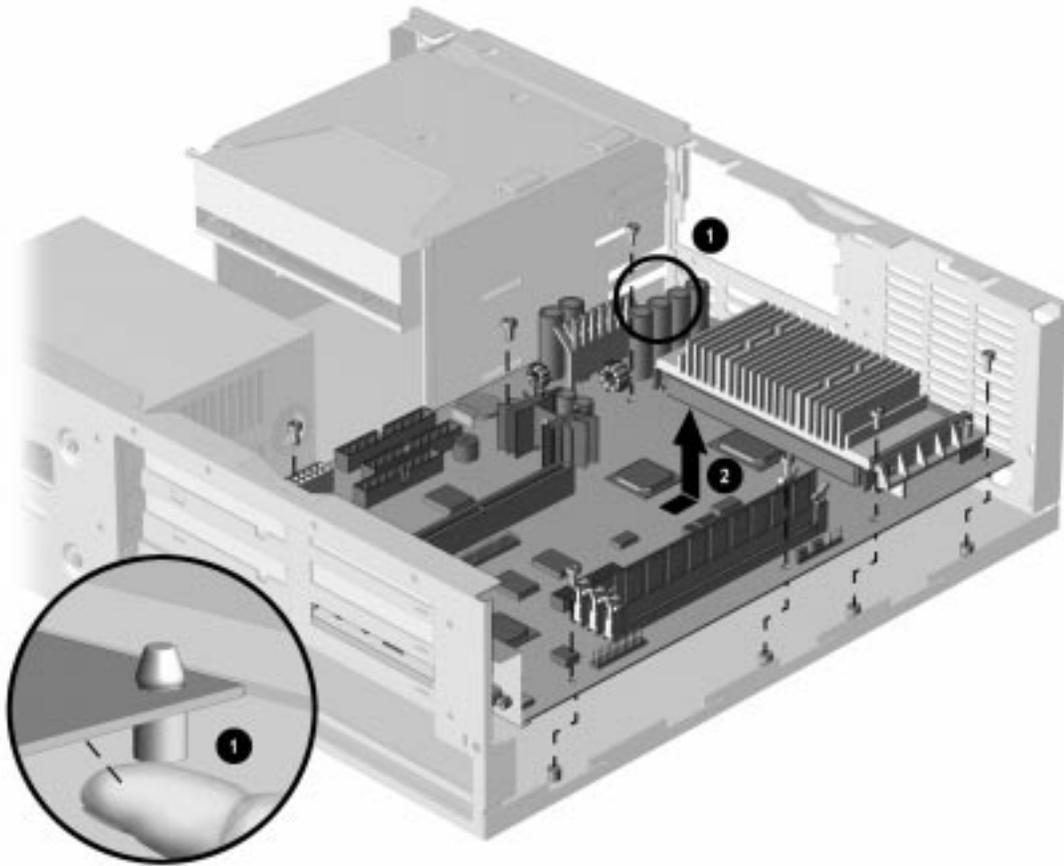
Figure 5-40. *Removing the Pentium II System Board*

✎ The riser brace has been removed for clarity.

To install a new system board, reverse the above procedures.

chapter 6

REMOVAL AND REPLACEMENT PROCEDURES - MINITOWER

This chapter provides subassembly/module level removal and replacement procedures for minitower models of the Compaq Deskpro 2000 Series of Personal Computers.

After completing all necessary removal and replacement procedures, run the Diagnostics utility to verify that all components operate properly.

6.1 Serial Number

The computer serial number should be provided to Compaq when requesting information or ordering spare parts. The serial number is displayed on the right side of the hood toward the front ❶ and on the rear of the chassis above the expansion slots ❷.

Figure 6-1. *Serial Number Location*

6.2 Disassembly Sequence Chart

Use the chart below to determine the disassembly sequence for removing components from the computer.

6.4	Computer Feet			
6.5	Cable Lock			
	6.6.1	Access Panel		
		6.7	Riser Brace	
			6.8	Expansion Board
				6.9 Expansion Board Guide
				6.10 Riser Board
			6.11	Speaker
			6.12.1	Memory Module
				6.13 System Board
			6.12.2	Microprocessor
			6.12.3	Cache Memory (Pentium only)
			6.12.4	System Board Graphics Memory Module Upgrade
			6.14	Replacement Battery (if full-length expansion board installed)
		6.14	Replacement Battery (if short expansion board installed)	
		6.15	ISA Option Board Retainer	
		6.16.1	Front Bezel	
			6.6.2	J Hood
			6.16.2	Power Button
			6.16.3	Bezel Blank
			6.16.4	Compaq Logo
			6.17.1	Power Supply Switch Assembly
				6.17.2 Power Supply
				6.18 LED Cable
				6.19.1 3.5-in Drive Bays
			6.19.2	5.25-in Drive Bays

6.3 Preparation for Disassembly

See Chapter 4, "Removal and Replacement Preliminaries," for initial procedures.

To prepare the computer for disassembly, complete the following steps:

1. Remove any diskette, compact disc, or tape from the computer.

2. Turn off the computer and any peripheral devices that are connected to it.

$\triangle$ **CAUTION:** Turn off the computer before disconnecting any cables.

3. Disconnect the power cord from the electrical outlet and then from the computer.

4. Disconnect all peripheral device cables from the computer.

✎ During disassembly, label each cable as you remove it, noting its position and routing. Keep all screws with the unit removed.

$\triangle$ **CAUTION:** The screws used in the computer are of different thread sizes and lengths; using the wrong screw in an application may damage the unit.

6.4 Feet

Four rubber feet are mounted to the underside of the chassis. If necessary, remove the old feet and scrape the residue of the old feet from the chassis using a small, flat-bladed screwdriver. To attach replacement feet to the chassis, remove the protective strip from the adhesive on the back of the new feet and press them into place.

Figure 6-2. *Installing the Feet*

6.5 Cable Lock

To install the cable lock provision, complete the following steps:

1. Remove one thumbscrew from the rear of the computer. Use a flat-bladed screwdriver if needed.

2. Separate the pieces of the security bracket by bending the metal where the three pieces join.

3. Insert the tang of the narrow bracket into the slot and slide the u-shaped bracket between narrow bracket and the system unit cover; then, install the self-tapping screw included in the cable lock kit.

4. Cover the screw with the flat portion of the bracket.

5. Install a lock (not provided) to secure the top part of the security bracket to control access to the inside of the computer. Install a cable lock (not provided) to secure the computer to an immovable location.
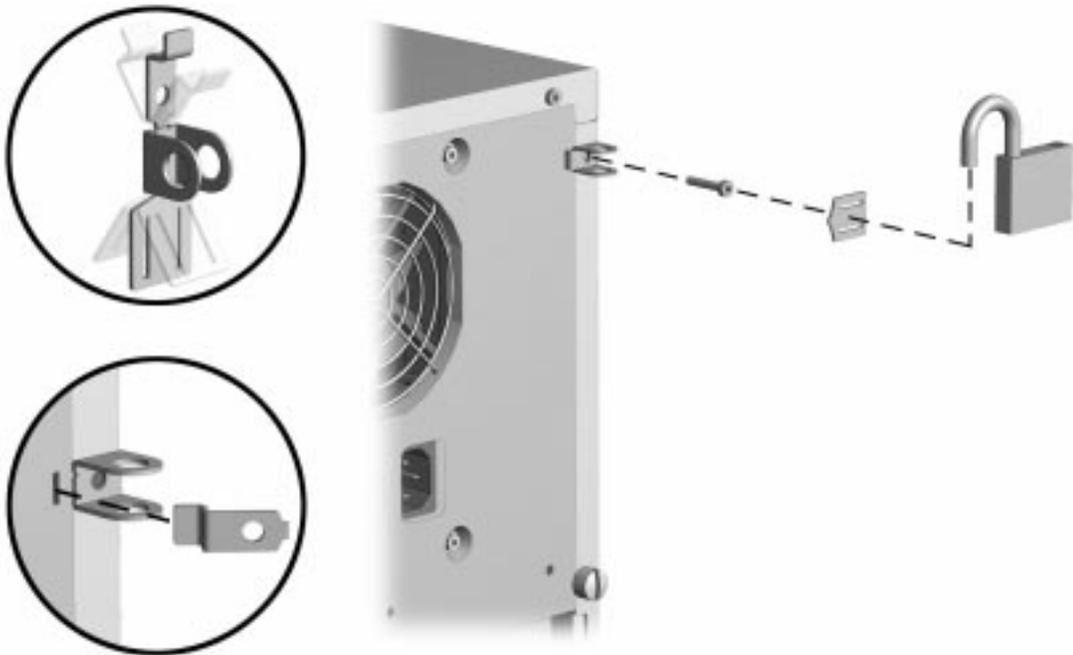
Figure 6-3. *Installing the Cable Lock*

To remove the cable lock provision, reverse the above procedure.

6.6 Exposing the Chassis

6.6.1   Access Panel

To remove the access panel, complete the following steps:

1. Prepare the computer for disassembly (Section 6.3).

2. Remove the thumbscrews at the rear of the computer to release the panel. You may need a flat-bladed screwdriver to loosen a stubborn screw.

   If the computer has a cable lock mechanism installed, refer to Section 6.5 for removal procedures.

3. Grasp the rear of the panel, pull it back about two to three inches (5 to 7 cm), pivot the top of the access panel out about one inch (2.5 cm), and lift the cover from the computer.

Figure 6-4. *Removing the Access Panel*

To replace the cover, reverse the above procedure.

6.6.2   Minitower J Hood

It is only necessary to remove the J hood if it has been damaged.

To remove the J hood, complete the following steps:

1. Remove the access panel (Section 6.6.1)

2. Remove the front bezel (Section 6.16.1).

3. Remove the four screws at the rear of the computer securing the J hood to the chassis.

4. Remove the single screw at the left front of the computer at the top.

5. Slide the J hood back about one-half inch (1.3 cm), and then lift it up from the chassis.

Figure 6-5. *Removing the J Hood*

To replace the J hood, reverse the above procedure.

6.7 Riser Brace

Before an expansion board can be installed or replaced, you must remove the riser brace that holds the expansion boards. Follow these steps to remove the riser brace:

1. Remove the access panel (Section 6.6.1).

2. Disconnect any cables attached to expansion boards on the assembly.

3. Lay the computer on its side, then grasp the riser brace at both ends and pull it out of the computer chassis. Use care when guiding it out of the unit to prevent damaging the boards.
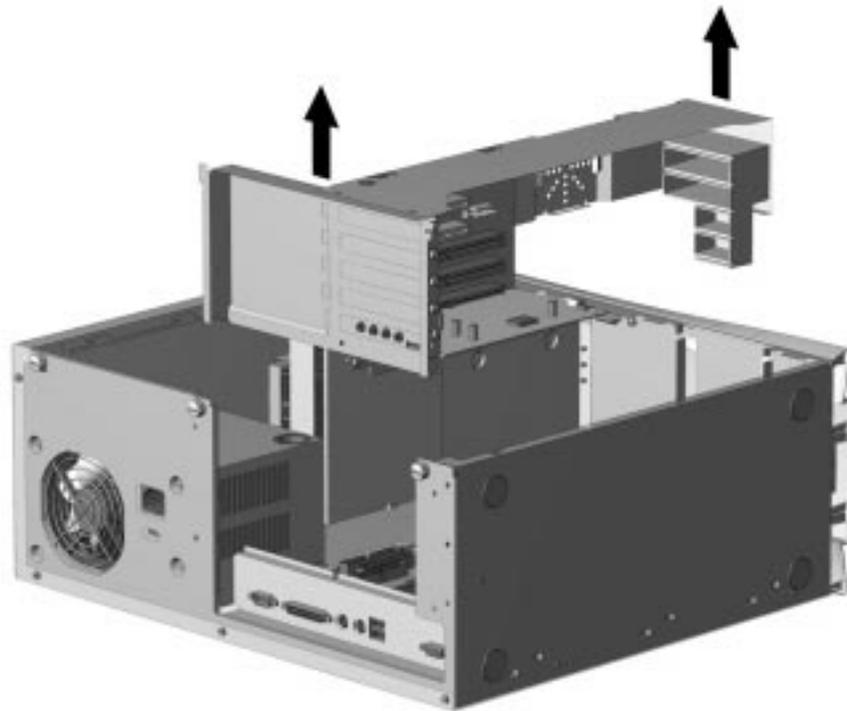
Figure 6-6. Removing the Riser Brace

To replace the riser brace, reverse the above procedure.

✎ When reinstalling the riser brace, fully seat the riser board attached to the case into the system board socket to ensure complete electrical contact.

6.8 Expansion Board

The Compaq Deskpro 2000 Series of Personal Computers contains five expansion slots on the expansion board.

❶ Two dedicated PCI expansion slots

❷ One PCI/ISA shared expansion slot

❸ Two dedicated ISA expansion slots
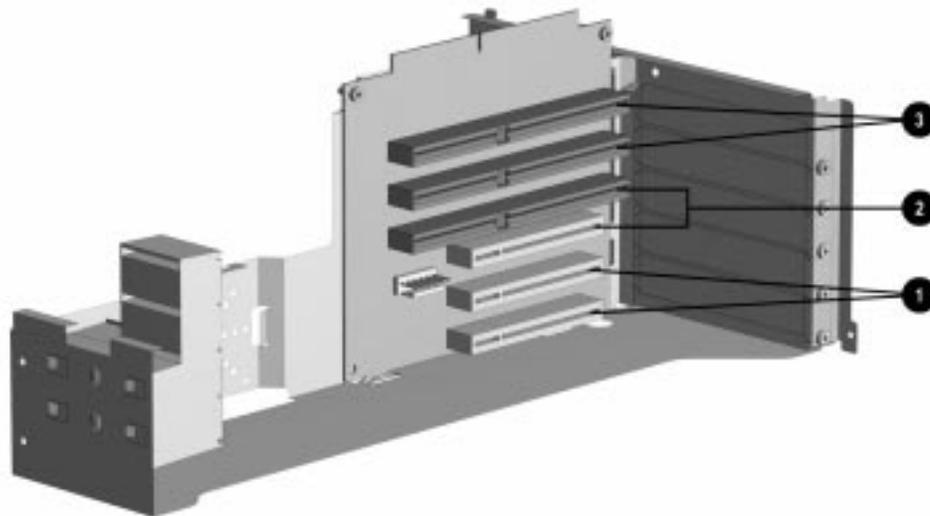
Figure 6-7. *Five Expansion Slots on the Riser Board*

To remove an expansion board, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Disconnect any cables attached to the expansion board.

3. Remove the riser brace (Section 6.7).

4. Remove the expansion board screw, then slide the expansion board out of the expansion slot.
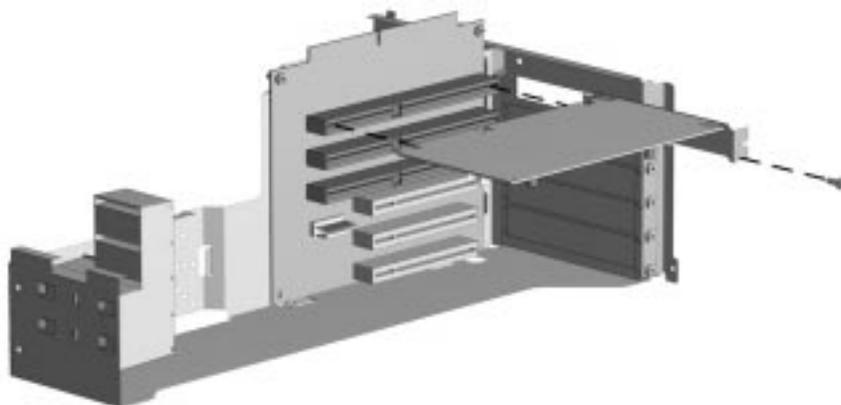
Figure 6-8. *Removing an Expansion Board*

To install an expansion board, reverse the above procedure.

✎ If you are installing an expansion board for the first time in a slot, remove the retaining screw and the expansion board slot cover before installing the board.
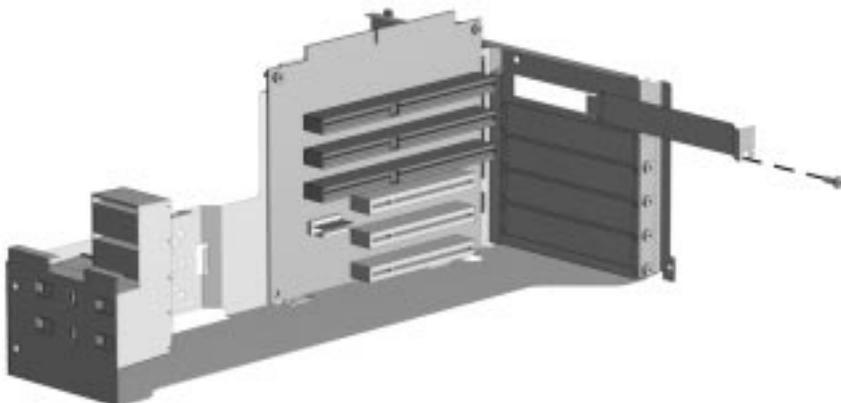
Figure 6-9. *Removing the Expansion Slot Cover*

6.9 Expansion Board Guide

To remove the expansion board guide, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the riser brace (Section 6.7).

3. Remove the expansion boards (Section 6.8).

4. Grasp the board guide firmly, press in on the two tabs ❶ in the center front of the board guide, and slide it to the right ❷ to unsnap it from the front of the riser brace.
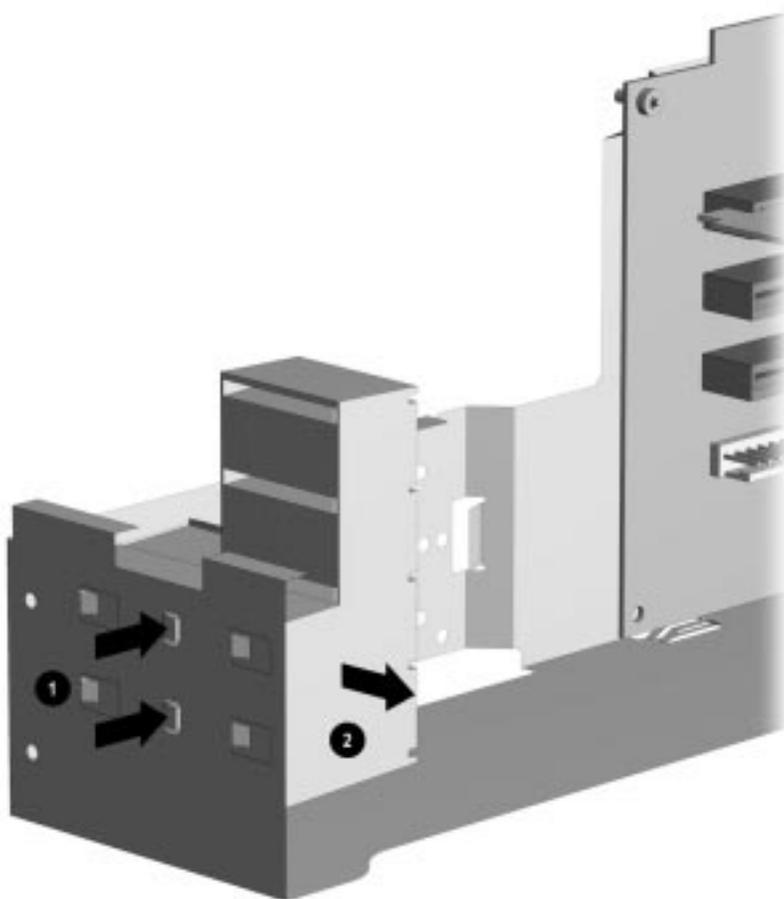
Figure 6-10. *Removing the Expansion Board Guide*

To replace the expansion board guide, reverse the above procedure.

6.10 Riser Board

To remove the riser board, complete the following steps:

1. Remove the access panel (Section 6.6.1).
2. Remove the riser brace (Section 6.7).
3. Remove the expansion boards (Section 6.8).
4. Remove the screws that secure the riser board to the riser brace.
5. Tilt the riser board slightly away from the riser brace and pull up.
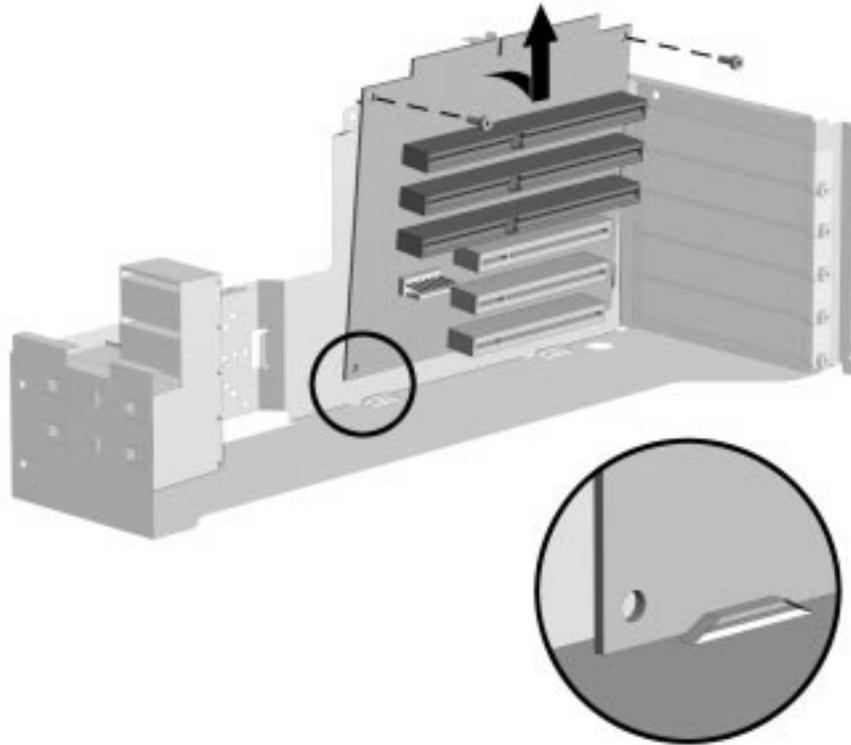
Figure 6-11. Removing the Riser Board

To replace the riser board, reverse the above procedure.

6.11 Speaker

To remove the speaker, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the riser brace (Section 6.7).

3. Disconnect the speaker cable from the audio board or the system board.

4. Remove the two speaker retaining screws.

5. Lift the speaker up out of the retaining tabs.
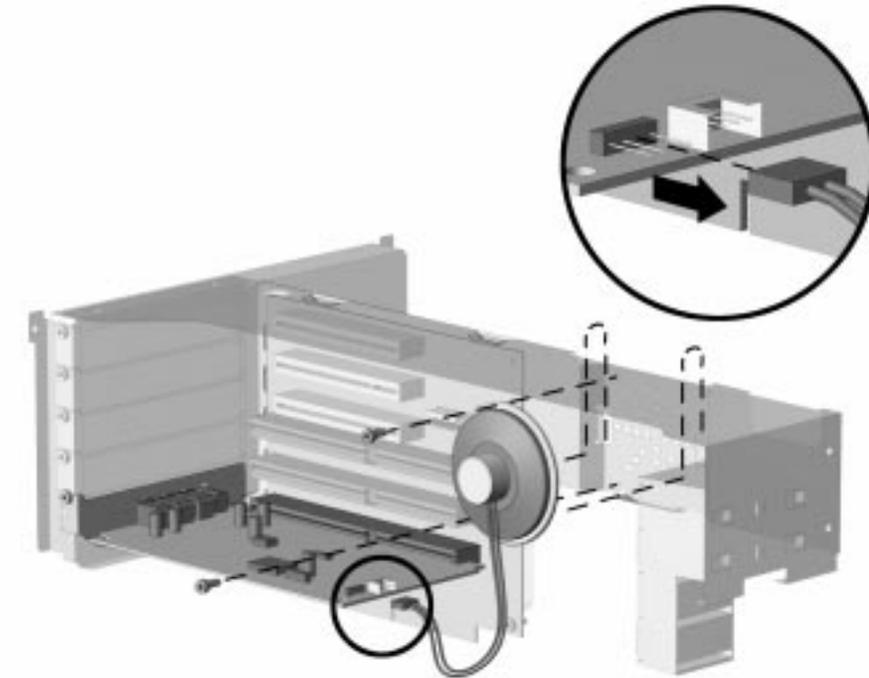
Figure 6-12. *Disconnecting the Speaker Cable from the Audio Board*

To install the speaker, reverse the above procedure.

6.12 System Board Components

6.12.1 Memory Module

Memory may be expanded by adding one or more DIMMs at a time onto the system board.

△ **CAUTION:** Static electricity can damage the electronic components of the computer or optional boards. Before beginning these procedures, ensure that you are discharged of static electricity by briefly touching a grounded metal object.

△ **CAUTION:** When handling a memory module, be careful not to touch any of the contacts. Doing so can damage the module.

To remove a memory module, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the riser brace (Section 6.7).

3. Press outward on both latches of the DIMM socket at the same time. This releases the module and partially pushes it out of the socket.

4. Lift the module from the socket.
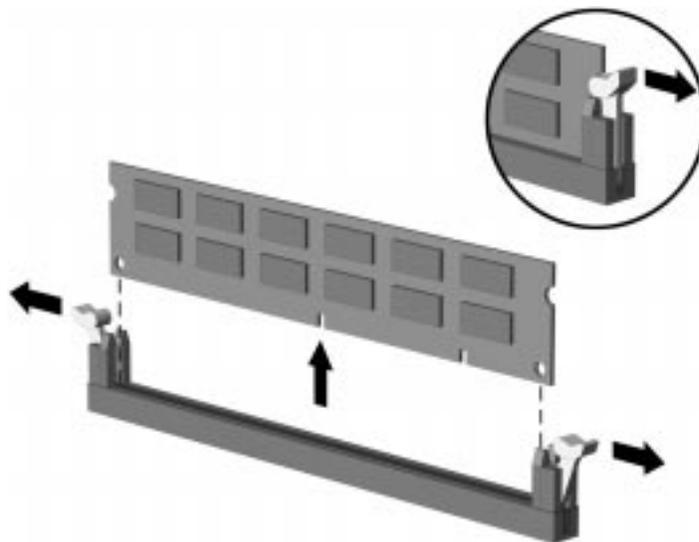
Figure 6-13. Removing a Memory Module

✎ For the location of the DIMM sockets on the system board, see Chapter 7.

To replace a DIMM, reverse the above steps.

✎ When the computer starts up, it will recognize the system memory upgrade and automatically reconfigure the computer.

6.12.2 Microprocessor

Pentium System Board

To remove the microprocessor from the Pentium system board, complete the following steps

1. Remove the access panel (Section 6.6.1).

2. Remove any cables attached to expansion boards on the riser assembly.

> ⚠ **CAUTION:** When replacing the processor, you must release the heat sink retaining clip before you pull the ZIF socket handle. The clip engages the processor socket to hold the heat sink in place.

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

3. Remove the riser brace (Section 6.7).

4. Remove the heat sink retaining clip ❶ by pressing down on the clip's extended tab until it releases from the safety catch.

5. Lift the heat sink ❷ off the processor.

6. Release the processor from the socket by pulling the handle on the ZIF socket out and upward ❹.

✎ The handle on the ZIF socket in the picture may not look identical to the one on the computer. All handle types perform the same function.

7. Lift the processor ❺ out of the socket.
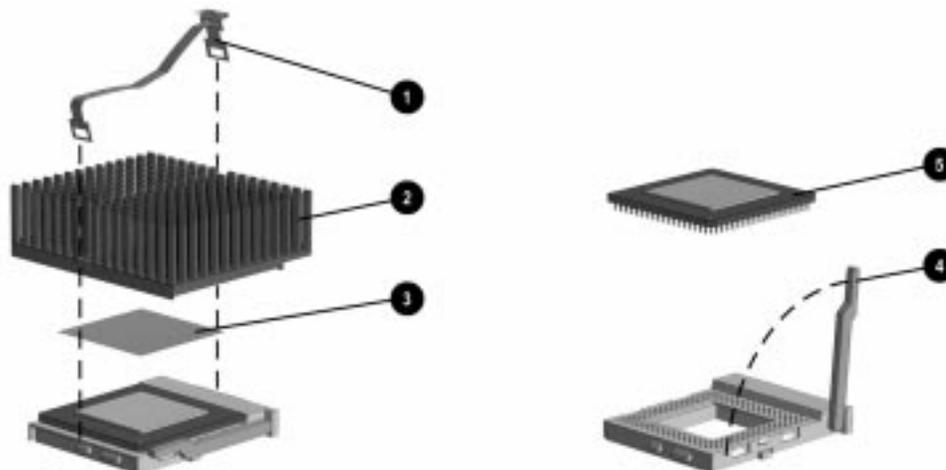
Figure 6-14. Removing the Microprocessor from the System Board

✎ For the location of the processor socket on the system board, see Chapter 7.

> ⚠ **CAUTION:** When replacing the processor, be sure the clipped corner of the processor (location of Pin 1) is aligned with the triangular area of the ZIF socket (marked * on the system board). Failure to do so could result in burning out both the processor and the system board.

To install the processor, complete the following steps:

1. Lower the processor ❺ into the ZIF socket. Ensure that pin 1 on the processor aligns with pin 1 on the ZIF socket.

    The location of pin 1 is indicated by a star (*) on the system board.

✎   The handle on the ZIF socket in the picture may not look identical to the one on the computer. All handle types perform the same function.

2. Push the ZIF handle ❹ on the ZIF socket back into place to secure the processor.

3. If the processor has a raised center, install thermal pad number 243226-001 ❸ on top of the processor before installing the heat sink.

    If the processor has a flat center, install thermal pad number 184616-002 ❸ on top of the processor before installing the heat sink.

> ⚠ **CAUTION:** Using the wrong thermal pad may cause the processor to overheat or short, resulting in failure.

4. Install the heat sink ❷ and the heat sink retaining clip ❶.

5. Install the riser brace.

6. Replace any cables that were removed.

7. Replace the access panel.

Pentium II System Board

To remove the microprocessor from the Pentium II system board, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove any cables attached to expansion boards on the riser assembly.

3. Remove the riser brace (Section 6.7).

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

4. Slide the system board back about 4 inches (10.2 cm) to expose the Pentium II processor.

> ⚠ **CAUTION:** Do not remove the air duct from the front of the unit. If the air duct is not installed, the processor will run hot which can cause damage to the processor.

5. Press in on the processor module release latches ❶ until they lock in the released position.

6. Pull the processor module away from the socket ❷.
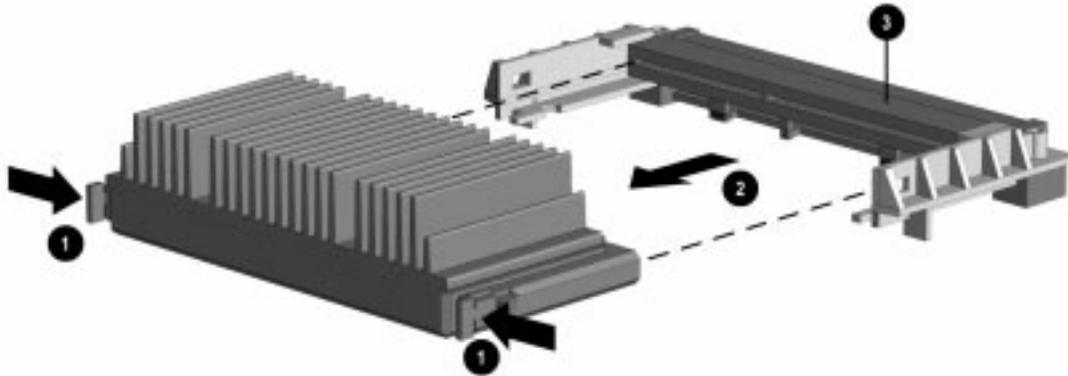
Figure 6-15. *Removing the Microprocessor from the Pentium II System Board*

✎ For the location of the processor on the Pentium II system board, see Chapter 7.

7. Lift the processor module to remove it from the guide rails and the machine.

To install the Pentium II processor, complete the following steps:

1. Ensure that the release latches are locked in the released position.

2. Set the Pentium II processor on the guide rails.

3. Slide the processor along the rails until it is firmly seated in the connector.

> △ **CAUTION:** Do not use the connector pins or pin guard ❸ as a handle. Even with the guard in place, the pins could bend causing shorts that will damage the processor.

4. Pull out on the release latches until they snap into place.

5. Replace the riser brace.

6. Replace any cables that were removed.

7. Replace the system unit cover.

6.12.3 Cache Memory (Pentium System Only)

To install an optional cache board onto the system board, complete the following steps:

1. Remove the access panel (Section 6.6.1).
2. Remove the riser brace (Section 6.7).
3. Install the cache memory board ❶ into the cache connector ❷ on the system board.

✎ Only use Compaq spare part number 278017-001.
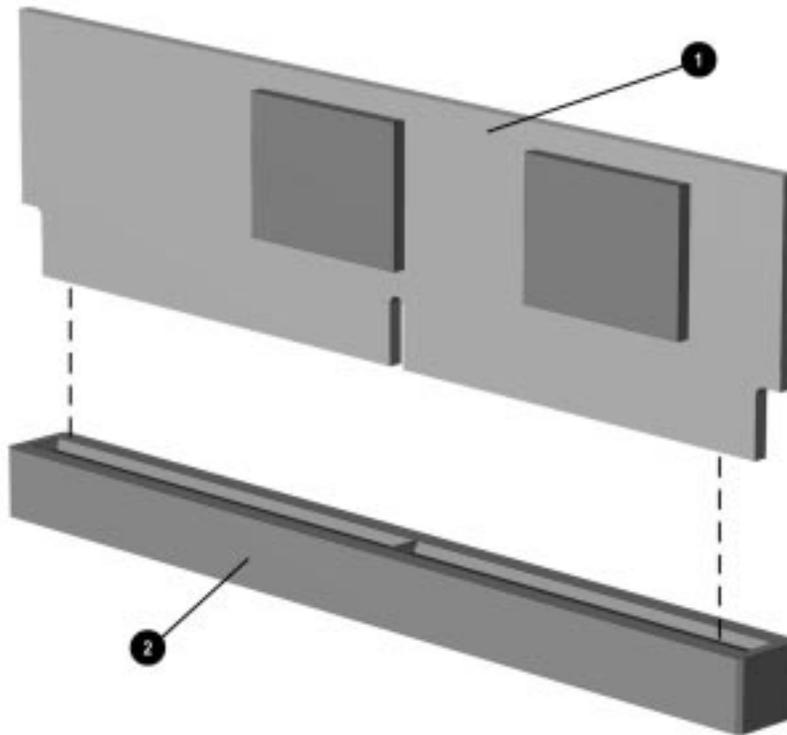
Figure 6-16. Installing the Cache Memory Board, Pentium System Board

✎ For the location of the cache memory socket on the Pentium system board, see Chapter 7.

4. Install the riser brace.
5. Replace the access panel.

6.12.4 System Board Graphics Memory Module Upgrade

To install a graphics memory module upgrade for the graphics controller that is preinstalled in the system board, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the riser brace (Section 6.7).

3. Install the graphics memory upgrade module onto the system board.
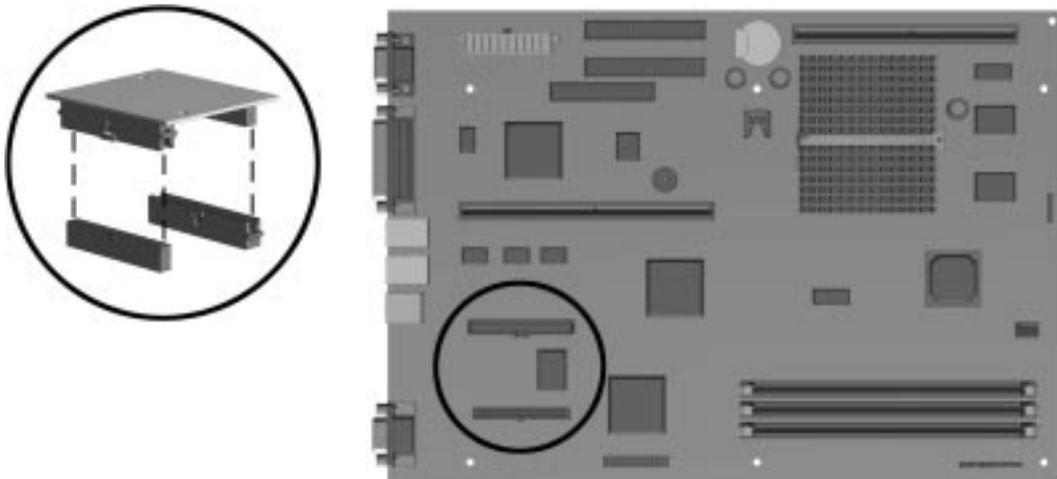
Figure 6-17. *Installing the Graphics Memory Upgrade Module on the Pentium System Board*
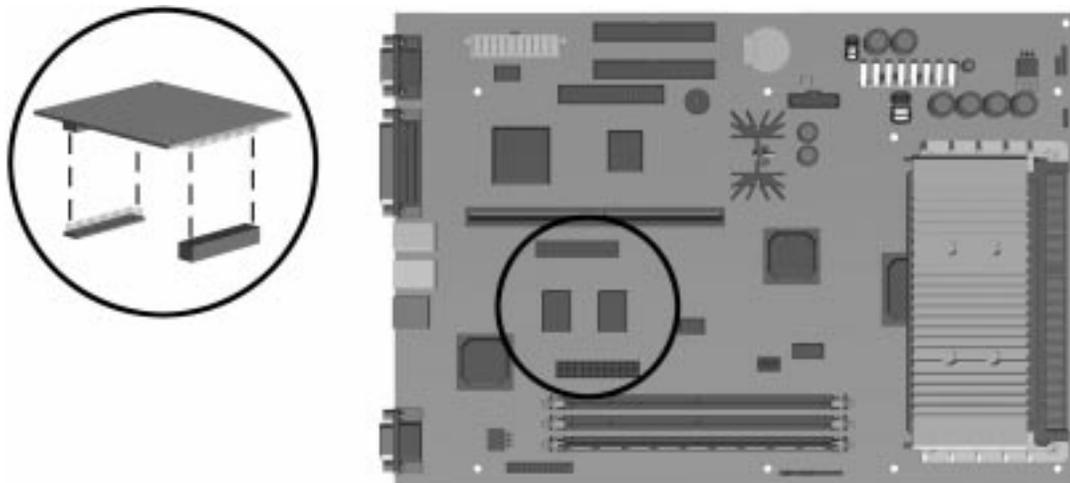
Figure 6-18. *Installing the Graphics Memory Upgrade Module on the Pentium II System Board*

4. Replace the riser brace and access panel.

5. Turn the computer on and start Windows 95.

6. Select the display icon in Windows 95 and follow the online instructions to take advantage of the additional display modes available with the upgraded memory.

To remove the graphics module, reverse the above procedure.

6.13 System Board

To remove the system board, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the riser brace (Section 6.7).

✎ If a replacement external battery is installed on the system board, do not unplug the battery from the system board connector as that will erase the CMOS. Remove the external battery from the hook-and-loop fastener on the chassis but leave it electrically connected to the system board.

3. Disconnect any cables attached to the system board.

> ⚠ **CAUTION:** If memory has been upgraded with a DIMM taller than 1.25 inches (3.2-cm) in the memory socket closest to the edge of the board, the DIMM must be removed prior to removing the system board to prevent damaging the DIMM, the DIMM socket, or the system board. It is not necessary to remove the system board in order to remove or install the DIMMs.

4. Remove any DIMMs installed on the system board (Section 6.12.1).

5. Slide the system board tray out of the computer.
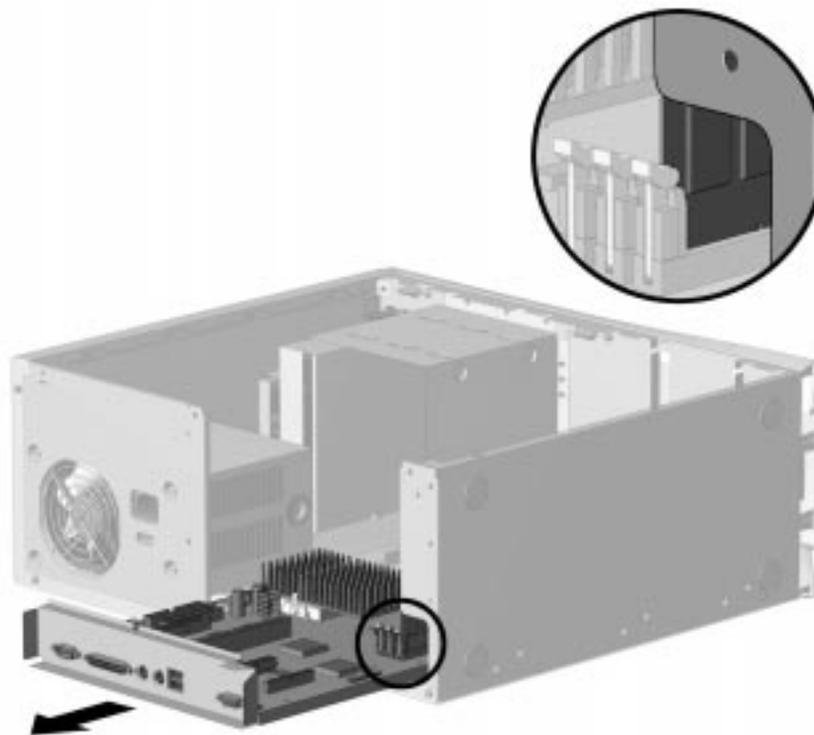
Figure 6-19. *Removing the Pentium System Board*
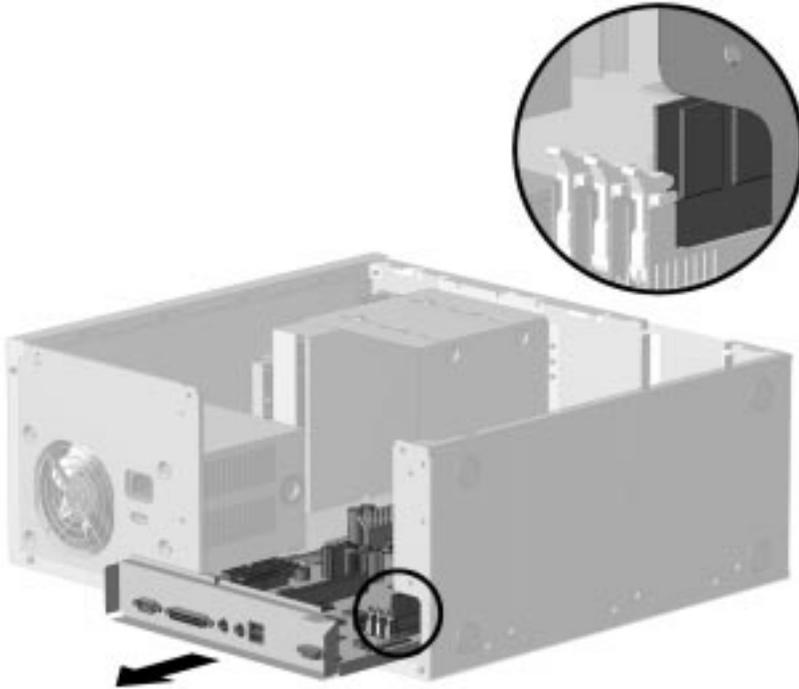
Figure 6-20. *Removing the Pentium II System Board*

To replace the system board, reverse the above procedure.

✎ When installing the Pentium II system board, ensure that the air duct is mounted in the front of the chassis with the alignment flaps ❸ against the sides. The processor slides under the top flap of the air duct.

⚠ **CAUTION:** Do not remove the air duct from the front of the unit. If the air duct is not installed or if the processor is not under the flap of the air duct, the processor will run hot, which can cause damage to the processor.
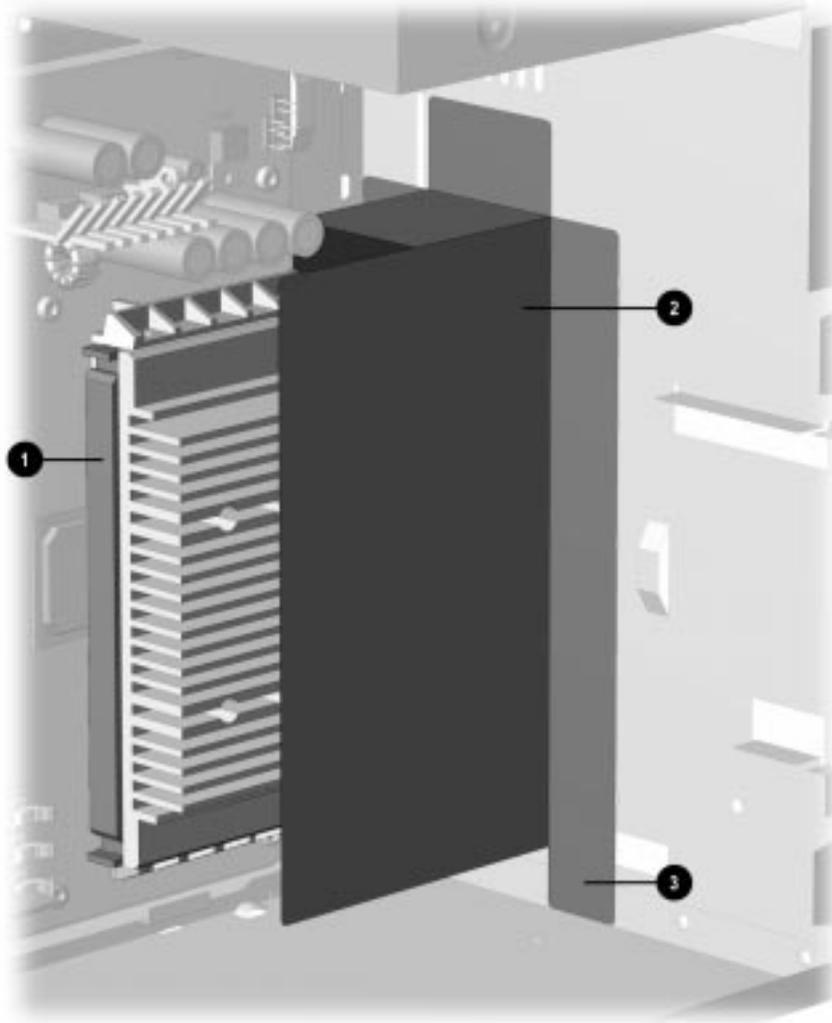
Figure 6-21. *Pentium II System Board with Processor ❶ and Air Duct ❷ Installed*

6.14 Replacement Battery

The real-time clock battery that came with the computer is non-replaceable and is permanently installed on the system board.

⚠ **WARNING:** The system board contains a clock/CMOS lithium battery. The lithium battery may explode if mistreated. The battery is soldered into place and may not be removed. Do not abuse or disassemble. Use only replacement batteries supplied by Compaq Computer Corporation.

✎ It is important to make a set of backup diagnostic diskettes before you install a new battery.

To install the external real-time battery, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the riser brace if a full-length ISA card is present (Section 6.7).

3. Connect the new battery to the pins on the battery header connector on the system board. The battery connector is labeled "E9 Ext. Batt." on the Pentium system board and labeled "Ext. Batt." on the Pentium II system board. When this battery is connected, the internal battery is automatically disconnected.

   The battery connector is keyed for proper installation.

4. Remove the backing from the adhesive on the hook-and-loop fastener strip attached to the battery, and attach the battery as shown.
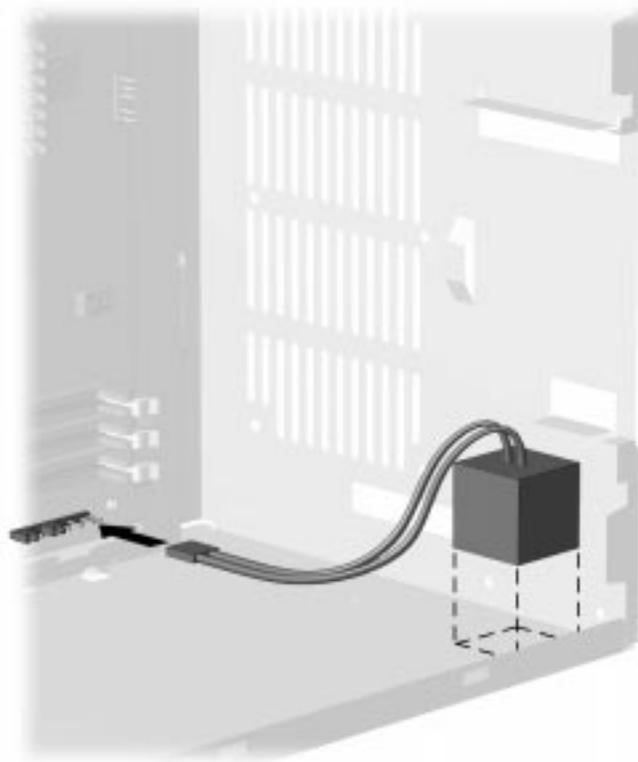
Figure 6-22. *Installing the Battery, Pentium System*
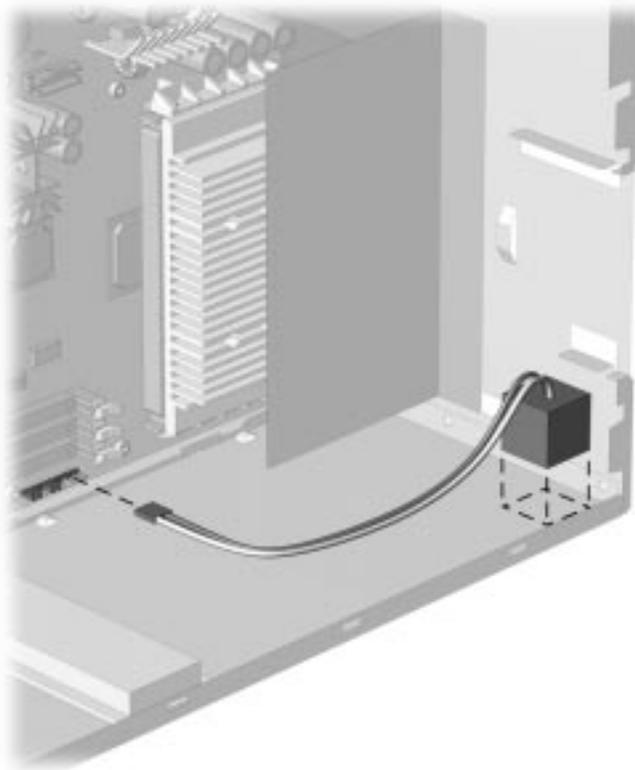
Figure 6-23. *Installing the Battery, Pentium II System*

5. Replace the riser brace if needed.

6. Replace the access panel.

7. Place the sticker contained in the battery kit onto the back of the computer above the power connector.

8. Reconnect any external devices and plug in the computer.

⚠ **WARNING:** This equipment is designed for connection to a grounded (earthed) outlet. The grounding type plug is an important safety feature. To avoid the risk of electrical shock or damage to the equipment, do not disable this feature.

9. Turn on the computer.

10. Run the computer Setup utility to reconfigure the system. Refer to Chapter 2, "Compaq Utilities."

6.15 ISA Option Board Retainer

To remove the ISA option board retainer, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. With the computer lying on its side, press down ❶ on the end of the retainer, then lift ❷ the retainer to remove it.
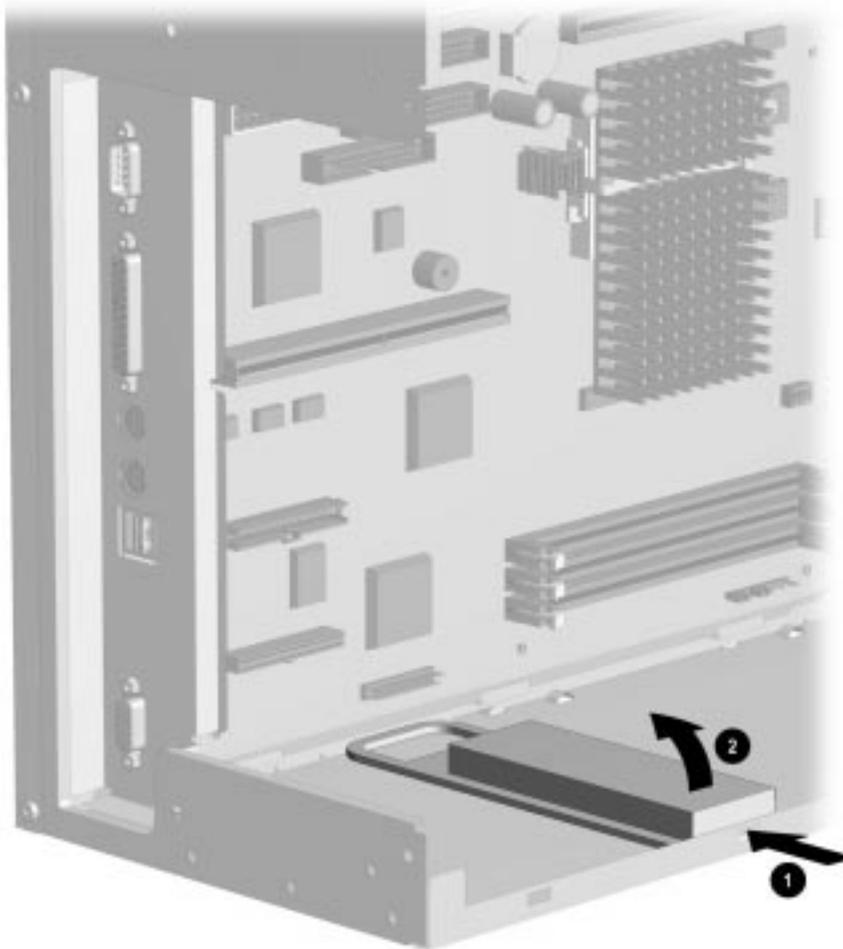
Figure 6-24. *Removing the ISA Option Board Retainer*

To replace the retainer, reverse the above procedure.

6.16 Front Bezel Assembly

The front bezel must be removed before removing or installing the J hood, the power supply, or any of the mass storage devices.

6.16.1   Front Bezel

The front bezel is attached to the computer chassis with release latches that are integrated into the bezel. To remove the front bezel, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. From the inside of the chassis, push in the release latches ❶ and push the side of the bezel out and away from the chassis ❷.

3. Rotate the front bezel out from the chassis, then slide it to the left.

4. Separate the bezel from the chassis.
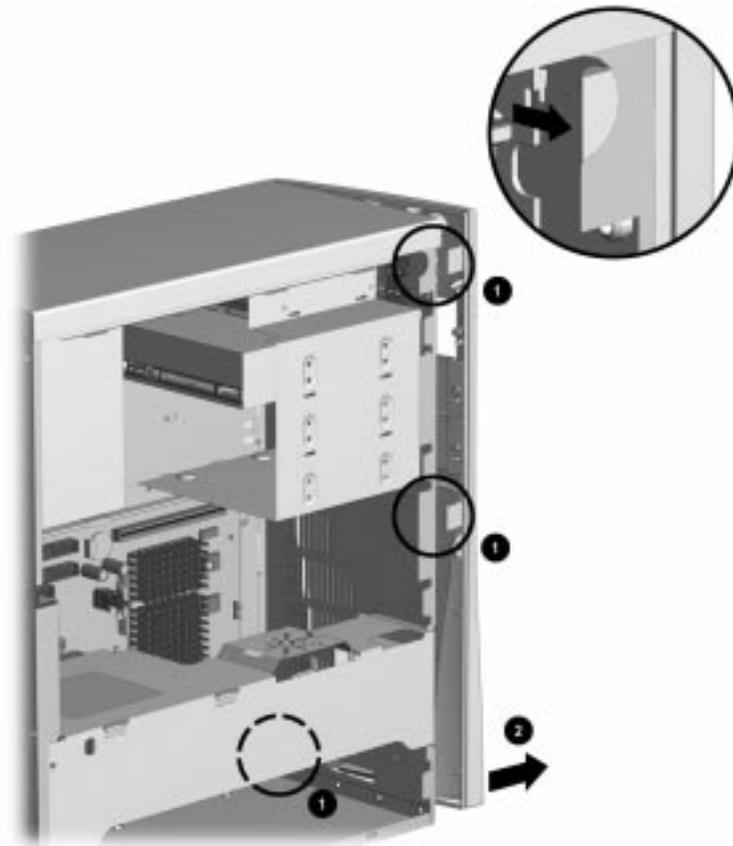
Figure 6-25. Removing the Front Bezel

To replace the bezel, reverse the above procedure. Ensure that the hinge points at the side of the bezel and the release latches are properly positioned before latching the bezel into place.

6.16.2 Power Button

To remove the power button, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Hold the front bezel in one hand with the inside surface towards you.

4. Pinch the two tabs of the power button together and push the button out of the front bezel. The spring will follow the button out of the housing.
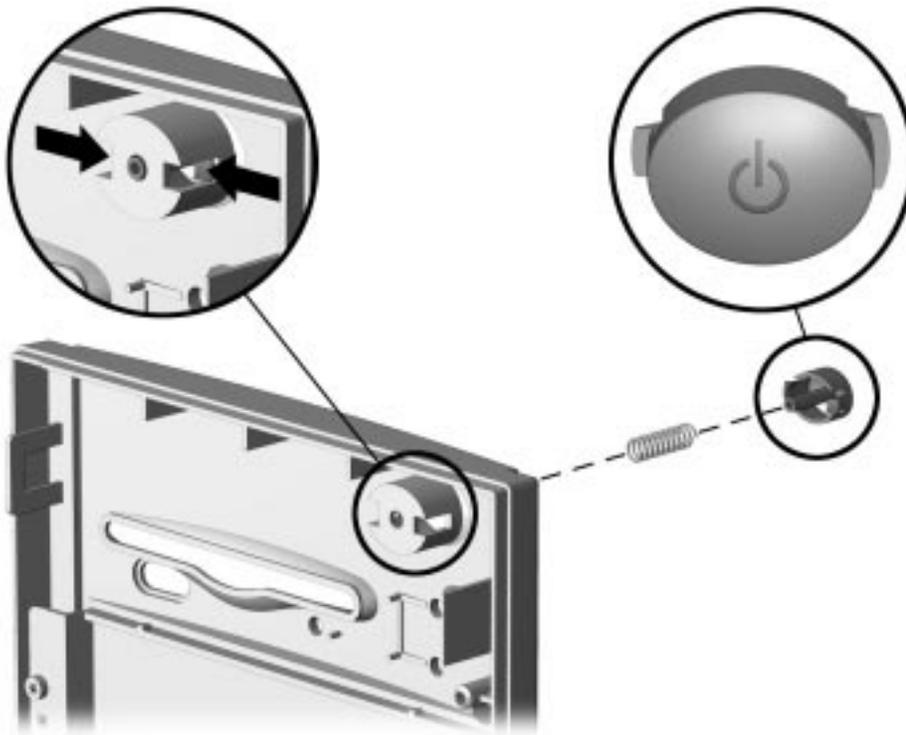
Figure 6-26. *Removing the Power Button*

To replace the power button, reverse the above procedure.

✎ When replacing the power button, be sure to use the button for a DC application as shown.

6.16.3 Bezel Blank

To remove a bezel blank, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Lay the front bezel face down on a protected work surface and remove the two screws that secure the bezel blank to the front bezel.

4. Remove the bezel blank from the front bezel.
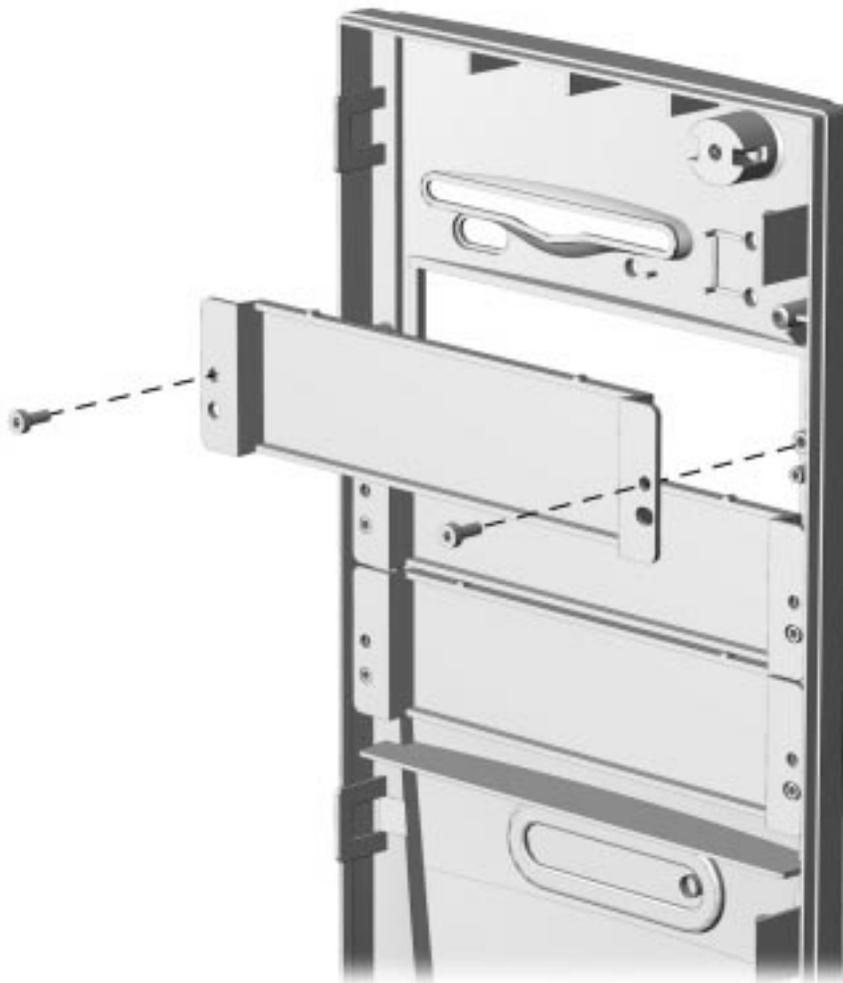
Figure 6-27. *Removing the Bezel Blank*

To reinstall the bezel blank, reverse the above procedure.

6.16.4 Compaq Logo

To remove the Compaq logo from the front bezel, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. From the inside of the front bezel, use a small screwdriver at the hole shown in the figure to push the logo out of its recess.

4. Clean the recessed area with a clean, dry cloth.

5. Remove the protective paper from the back of the replacement logo and press the logo into place.

Figure 6-28. *Replacing the Compaq Logo*

If the original logo is missing, complete steps 4 and 5 to install a replacement logo without having to remove any part of the computer.

6.17 Power Supply Assembly

6.17.1   Power Supply Switch Assembly

To remove the power supply switch, complete the following steps:

1. Remove the access panel (section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Remove the plastic switch holder from the chassis. To remove the plastic switch holder from the chassis:

   ❏ Place your thumb on top of the chassis ❸ and your index finger on the release tab ❶.
   ❏ Squeeze the tab toward the top of the chassis.
   ❏ While squeezing the tab, pull the holder up ❷ and out of the chassis.

4. Remove the wires from the switch.
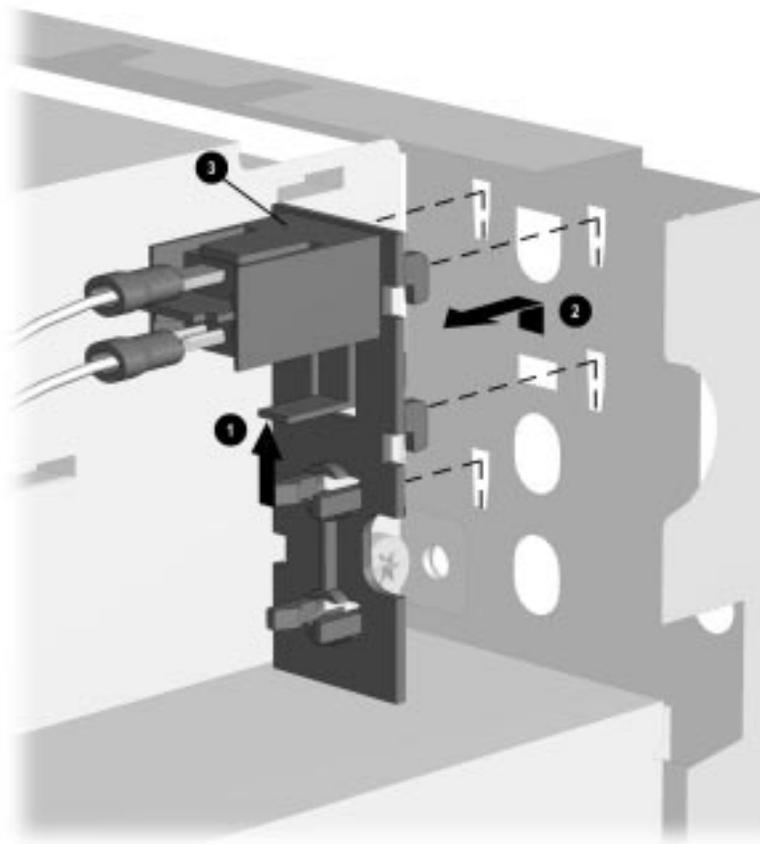
Figure 6-29. *Removing the Power Supply Switch and Bracket*

To install the power switch assembly, complete the following steps.

1. Install a new power switch into a new switch holder. To install the power switch into the switch holder:

    ❏ Insert the switch into the back of the holder.

    ❏ Push the switch until it snaps into place.
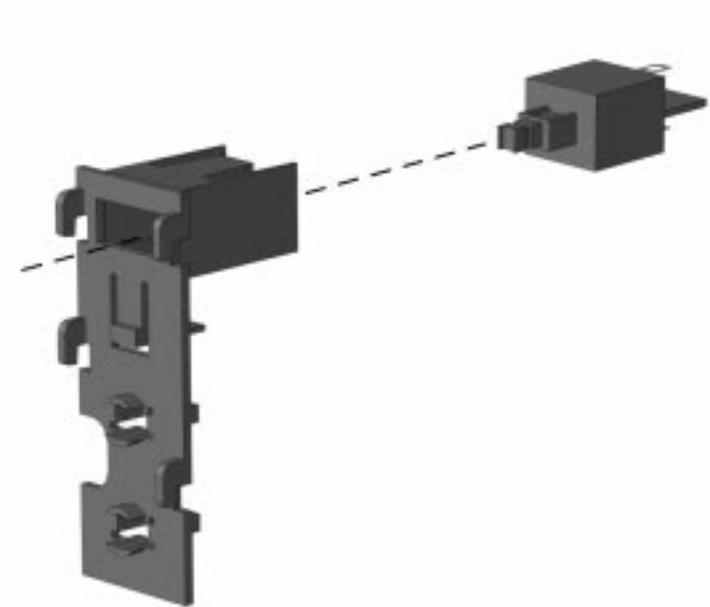
Figure 6-30. *Installing the Switch into the Holder*

2. Install the power switch assembly into the chassis. To insert the power switch assembly into the chassis:

    ❏ Insert the prongs of the switch holder into the slots in the chassis.

    ❏ Push down on the switch holder to snap the holder into place.

3. Attach the wires to the switch.

4. Replace the front bezel (Section 6.16.1).

5. Replace the access panel (Section 6.6.1).

6.17.2 Power Supply

To remove the power supply, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Remove the power supply switch (Section 6.17.1).

4. Disconnect all power cables from the mass storage devices and the system board.
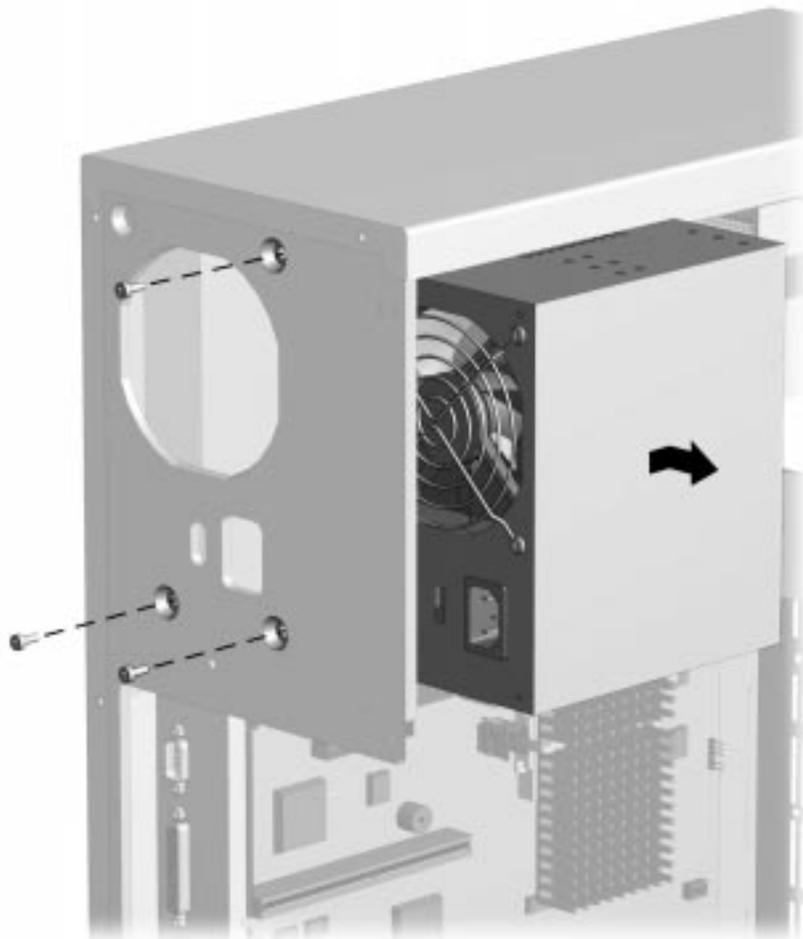
Figure 6-31. *Removing the Rear Screws and the Power Supply*

5. From the outside of the chassis, remove the three screws that secure the power supply to the back of the chassis.

6. Slide the power supply towards the front of the chassis and lift up to remove it from the chassis.

To replace the power supply, reverse the above procedure.

6.18 LED Cable

To remove the LED cable, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Disconnect the cable from the connection on the system board.

4. Remove the power supply switch assembly (Section 6.17.1).

5. To remove the LEDs from the switch bracket, gently pull on the cable while at the same time spreading the clips of the LED retainers.
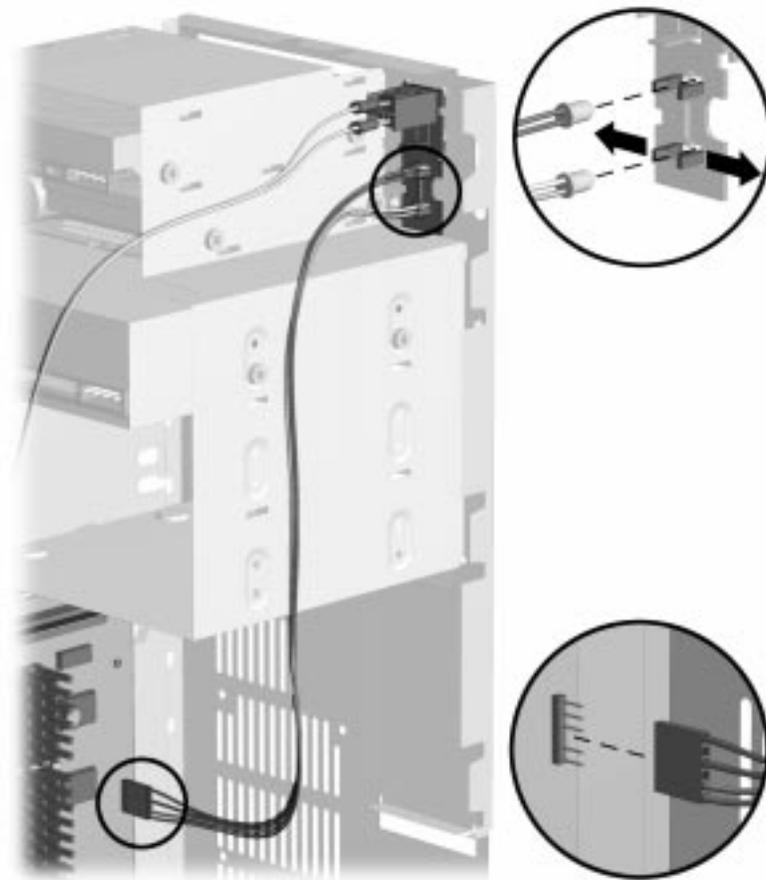
Figure 6-32. *Removing the LED Cable Assembly, Pentium System*
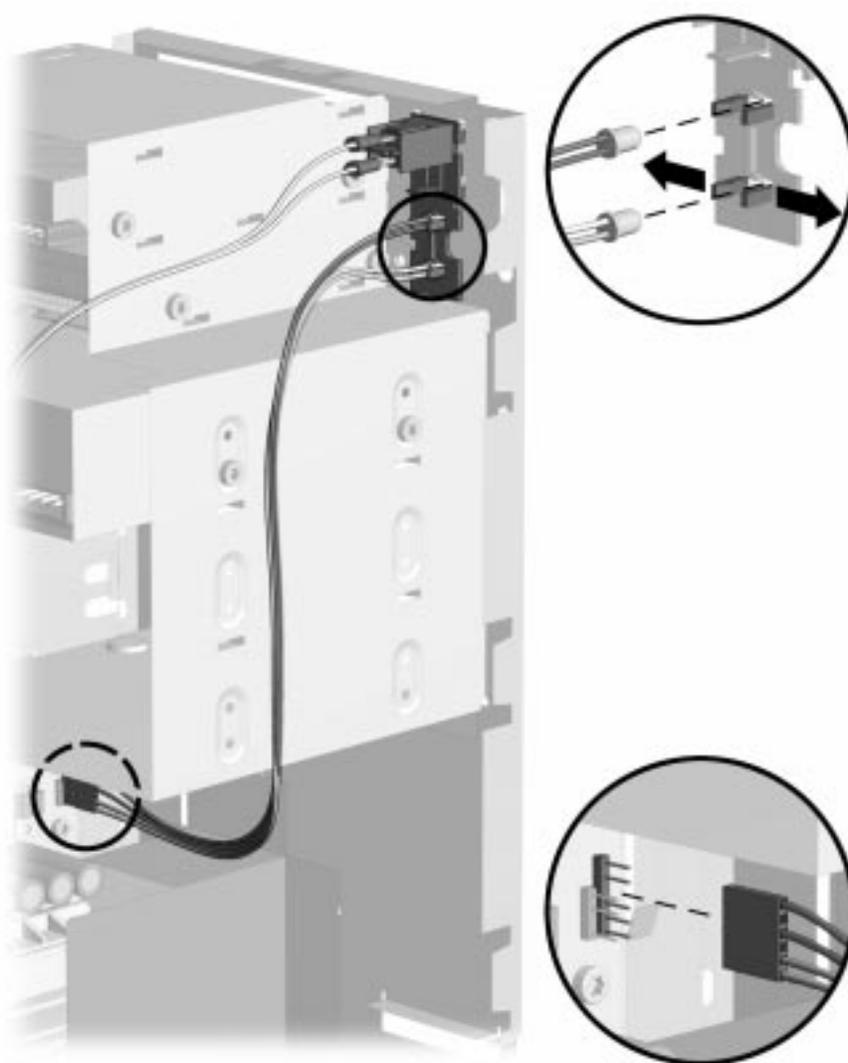
Figure 6-33. *Removing the LED Cable Assembly, Pentium II System*

To install the LED cable, reverse the above procedure.

✎ When reinstalling the LED end, place the LED with the black wire on top and the LED with the white wire on the bottom. The connector is keyed to ensure proper installation.

6.19 Mass Storage Devices

This section discusses the removal and replacement procedures for the mass storage devices that are supported on the Deskpro 2000 Series of Personal Computers. Refer to Chapter 1, Section 1.5.2, "Drive Positions."

6.19.1 3.5-Inch Drive Bays

To remove a 3.5-inch drive from the 3.5-inch drive bay, complete the following steps:

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Remove the power switch assembly (Section 6.17.1).

4. Disconnect the cables from the back of the drive.
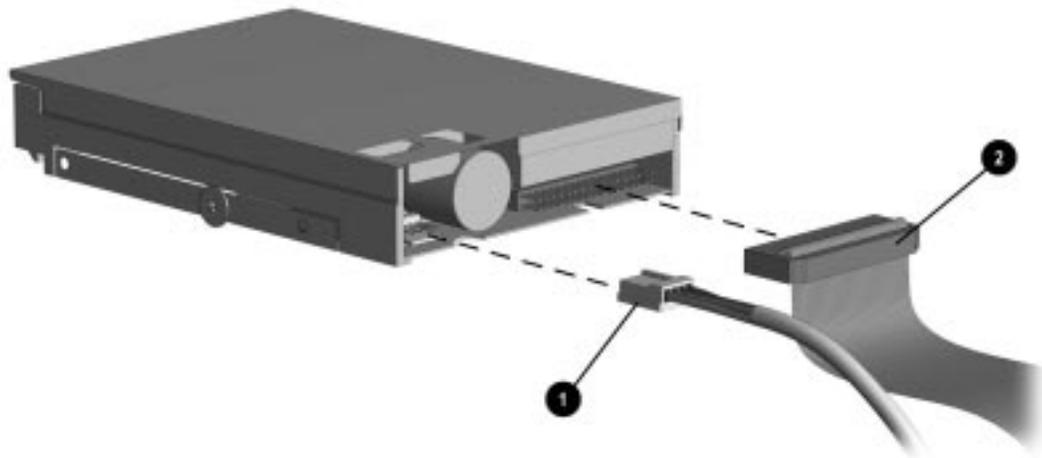
Figure 6-34. *Disconnecting the Power* ❶ *and Signal* ❷ *Cables from the 3.5-Inch Diskette Drive*

✎ When installing a second diskette drive, it is necessary to configure the computer using Computer Setup.

Refer to Chapter 7, "Jumper and Switch Information," for the location of the ribbon cable connections on the system board.

5. Remove the two wafer screws on the left of the drive that secure the drive into the chassis.

6. Pull the drive straight out of the chassis.
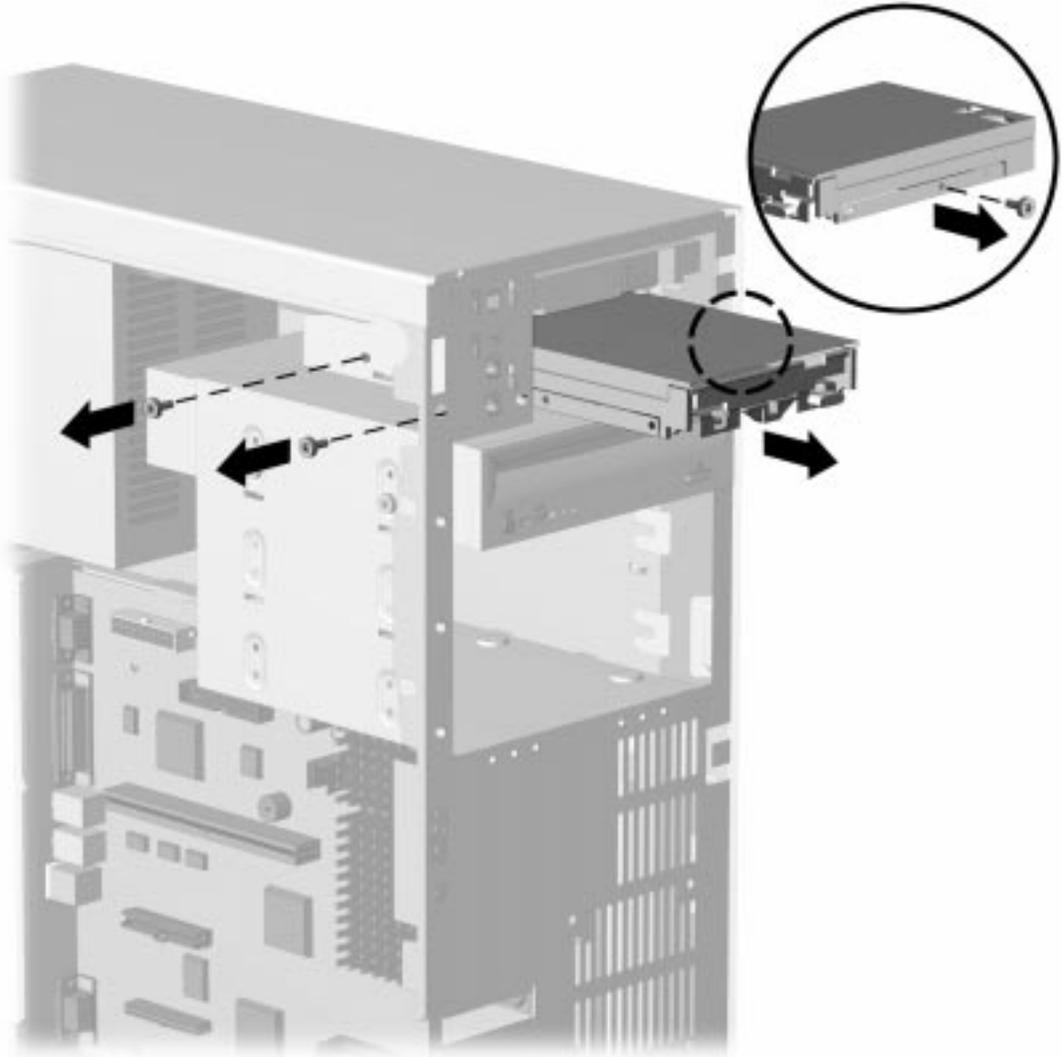
Figure 6-35. *Removing the 3.5-Inch Diskette Drive*

When replacing this drive, transfer the single wafer screw that takes the place of a drive rail from the old drive to the new one. This screw is located on the right side of the drive in the middle.

To replace the 3.5-inch drive, reverse the above procedure.

⚠ **CAUTION:** When servicing the computer, ensure that cables are placed in their proper locations during the reassembly process. Improper cable placement can damage the computer.

⚠ **CAUTION:** Use only 3/16-inch or 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

6.19.2   5.25-Inch Drive Bays

The 5.25-inch drive bays may be occupied by diskette drives, hard drives, CD-ROM drives, PD-CD drives, LS-120 drives, or tape drives. Removal of a CD-ROM drive is shown.

⚠ **CAUTION:** All removable media should be taken out of the drive before removing the drive from the computer.

1. Remove the access panel (Section 6.6.1).

2. Remove the front bezel (Section 6.16.1).

3. Disconnect the cables from the back of the drive.
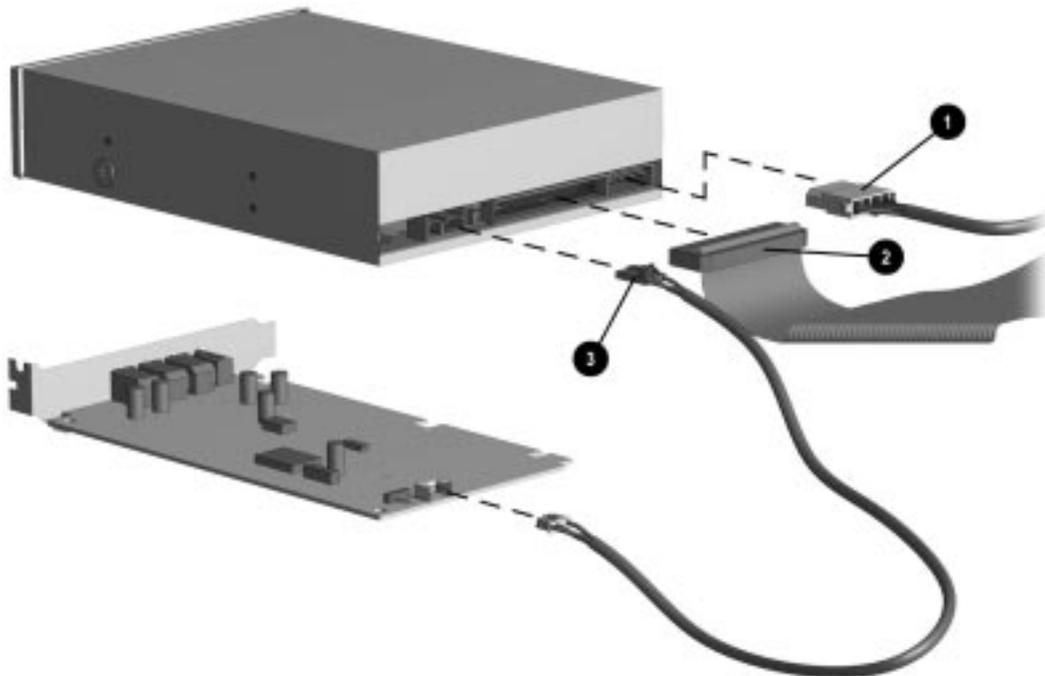
Figure 6-36. *Disconnecting the Power ❶, the Signal ❷, and the Audio ❸ Cables from a CD-ROM Drive and Optional Audio Board*

4. Remove the two screws on the left side of the drive bay that secure the drive to the chassis.

5. Pull the drive straight out of the chassis.
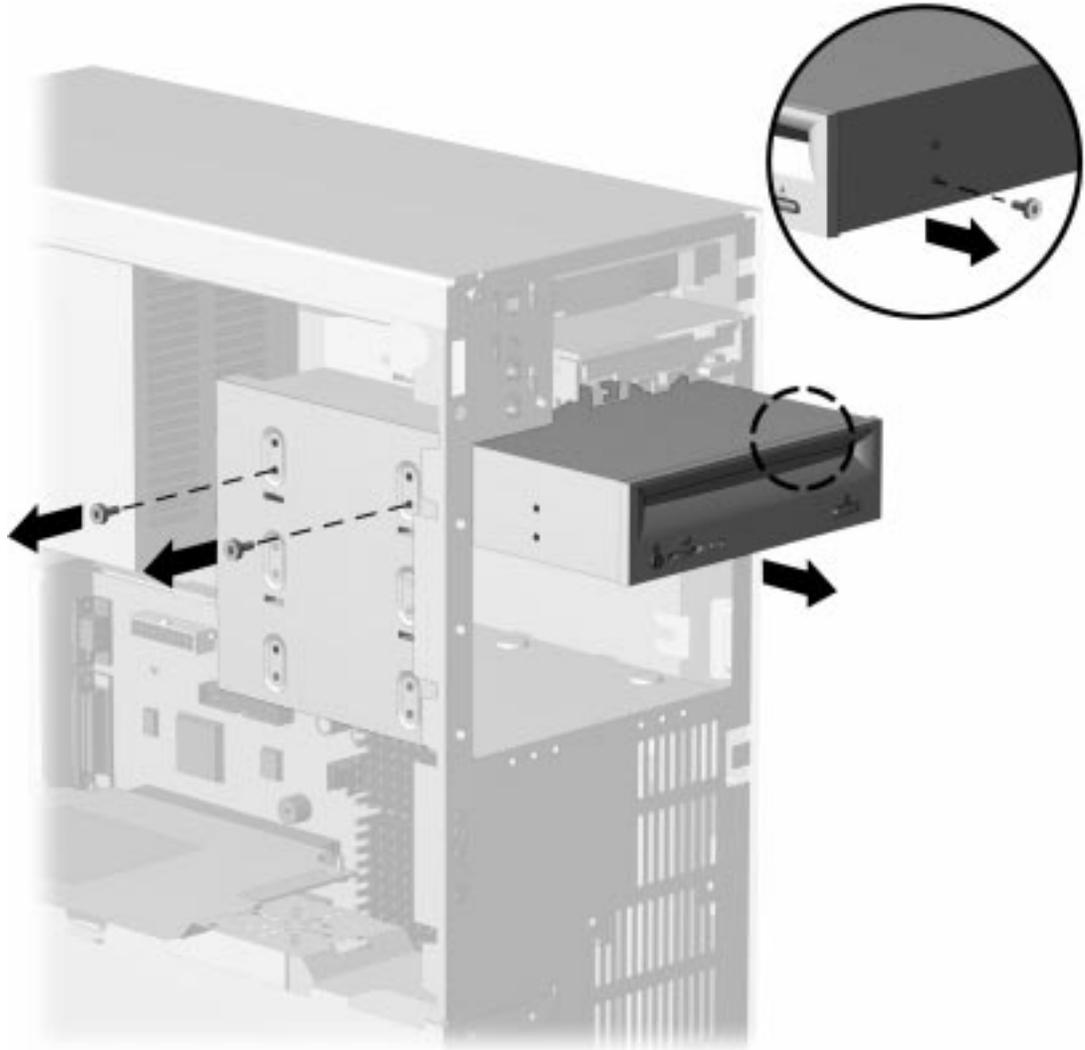
Figure 6-37. *Removing the CD-ROM Drive*

When replacing this drive, transfer the wafer screw that takes the place of a drive rail from the old drive to the new one. The screw is located on the right side of the drive, in the middle.

To replace the 5.25-inch drive, reverse the above procedures.

6.19.3 Installing a New Drive

When installing a new drive, you should use either the wafer screws provided in the option kit or the extra U.S. or metric screws, both of which are stored in the front of the computer chassis for this purpose. The same screws that are used as guide screws are used as retainer screws to secure the drive in the drive bay. Select the appropriate screws for the application.

✎ Metric screws have a black finish while U.S. screws have a silver finish.
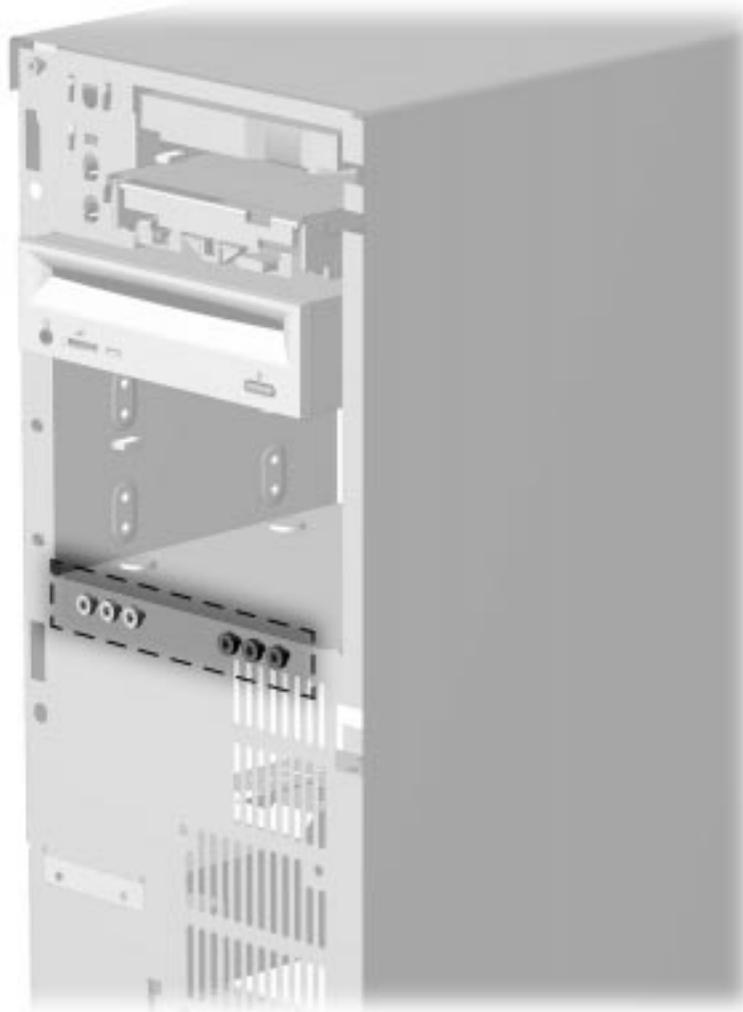
Figure 6-38. *Locating the Mounting Screws*

If you are installing a 3.5-inch diskette drive in a 5.25-inch drive bay, use Compaq bracket spare part number 243230-001, which comes with a preinstalled bezel

If you are installing a 3.5-inch hard drive in a 5.25-inch drive bay, use Compaq bracket spare part number 243231-001.

To install a 3.5-inch drive into a 5.25-inch drive bay, begin with step 1.

To install a 5.25-inch drive into a 5.25-inch drive bay, begin with step 3.

1. Place the 3.5-inch drive into the bracket.

2. Insert two screws into the two bracket holes on each side of the bracket to secure the drive.
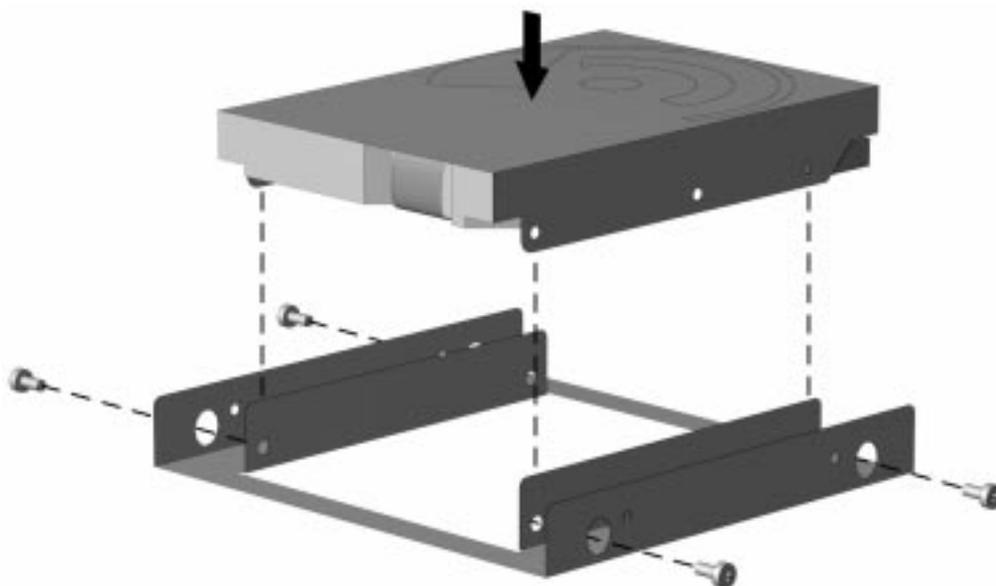
Figure 6-39. *Installing the Hard Drive into the Mounting Bracket*

> ⚠ **CAUTION:** Use only 3/16-inch or 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

3. Install one wafer screw on the right side of the drive or bracket towards the front. This acts as a guide rail to align the bracket in the drive bay.

Figure 6-40. *Installing the Wafer Screw on the Right Side of the Bracket*

✎ Use the screws provided on the front of the unit. These screws may be different from those illustrated.

4. Install the drive or bracket assembly into the drive bay. Ensure that the guide screw fits into the tab on the side of the bay.

5. Secure the drive or bracket assembly with two wafer screws.
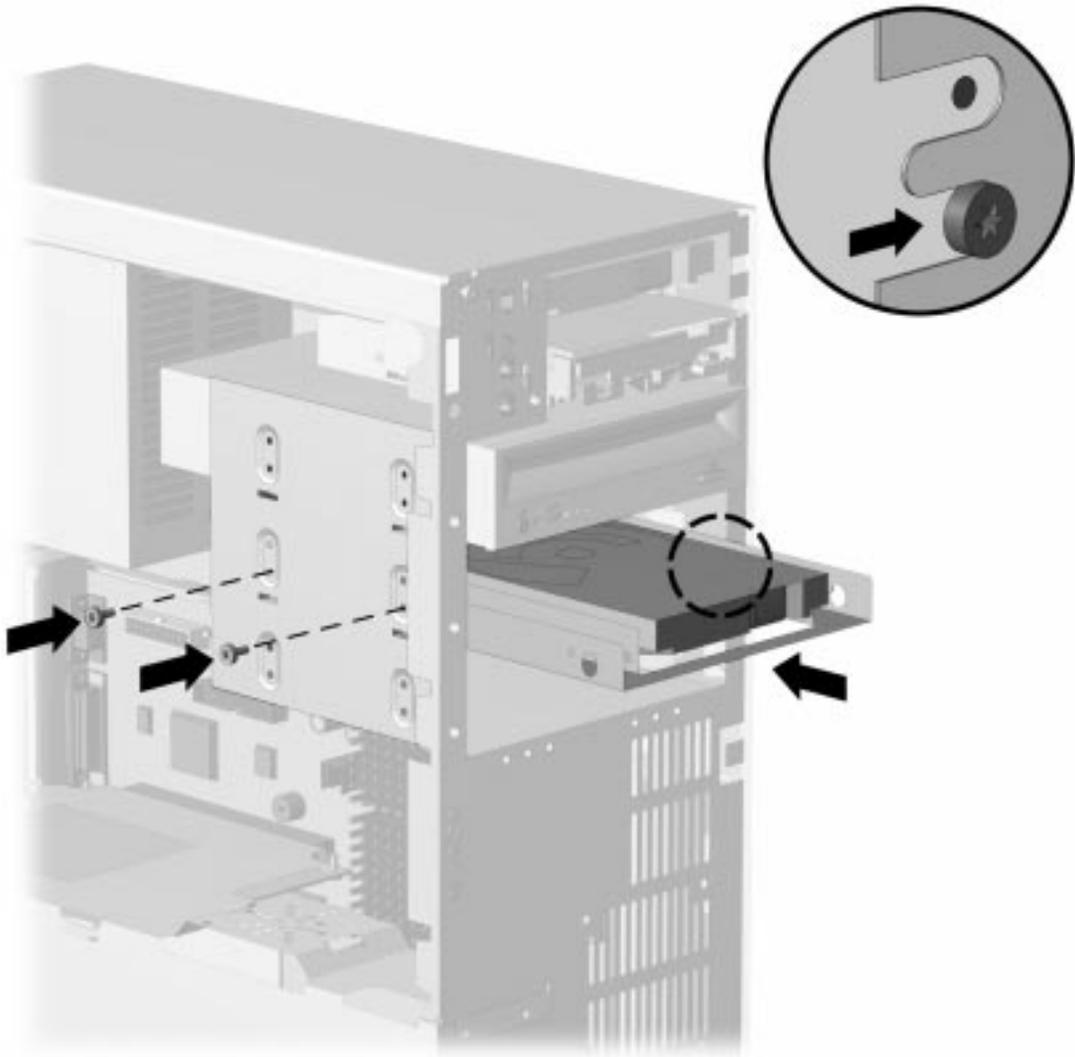
Figure 6-41. *Installing the Bracket Assembly and Securing It with the Wafer Screws*

6. Connect the drive cables. Refer to Section 6.19.1 for a diskette drive and Section 6.19.2 for a CD-ROM drive.
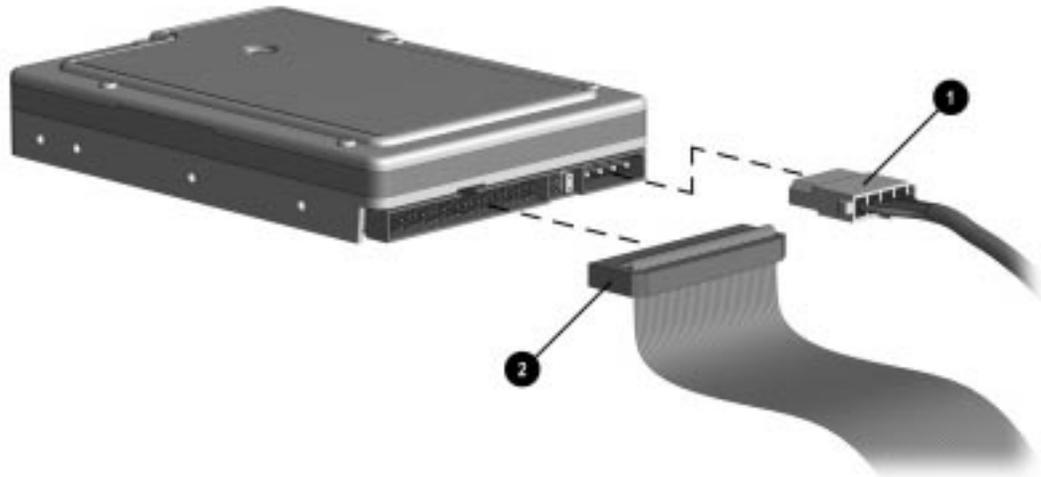
Figure 6-42. *Connecting the Power ❶ and the Signal ❷ Cables to a Hard Drive*

7. Remove the bezel blank from the front bezel if necessary (Section 6.16.3).

8. Install the front bezel (Section 6.16.1).

9. Install the access panel (Section 6.6.1).

10. The system will automatically recognize a hard drive sold by Compaq and will automatically reconfigure the computer. If you have installed a third-party hard drive, you will need to run Computer Setup to reconfigure the computer. Refer to Chapter 2, "Compaq Utilities," for information on running Computer Setup.

chapter 7

JUMPER AND SWITCH INFORMATION

This chapter provides jumper and switch information for system board jumpers, system I/O board connectors, and hard drives for the Compaq Deskpro 2000 Series of Personal Computers.

7.1 System Board Switches

7.1.1 Pentium-Based System Boards

The following illustration shows switch, connector, and jumper locations. Table 7-1 gives a description of them.
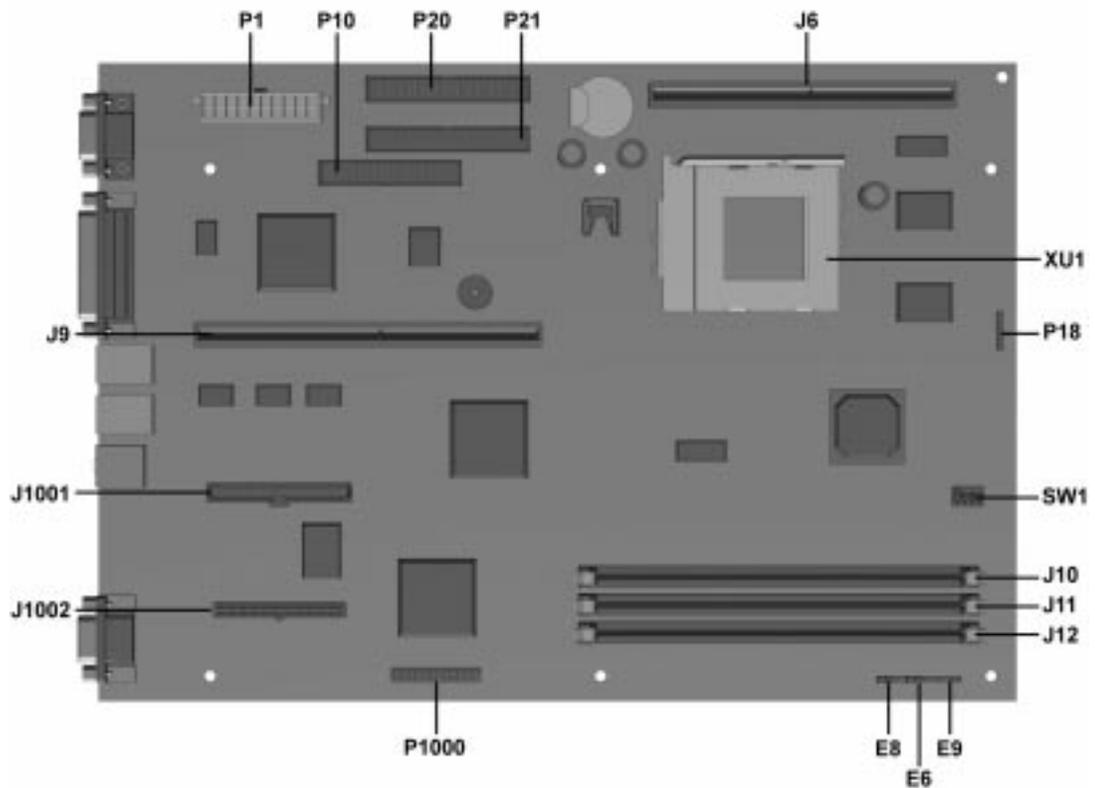
Figure 7-1. *Pentium System Board Switch, Connector, and Jumper Locations*

Table 7-1
Pentium System Board Connectors, Jumpers, and Switches

Device	Description
E6	Power-on password enable/disable header
E8	Clear CMOS header
E9	External (replacement) battery
J6	Cache memory connector
J9	Riser board socket
J10	DIMM #1 socket
J11	DIMM #2 socket
J12	DIMM #3 socket
J1001	Graphics memory upgrade socket (used with J1002)
J1002	Graphics memory upgrade socket (used with J1001)
P1	Power connector
P10	Diskette cable socket
P18	LED socket
P20	Primary IDE/EIDE cable socket
P21	Secondary IDE/EIDE cable socket
P1000	VESA socket
SW1	Processor/bus speed selector
XU1	Microprocessor socket
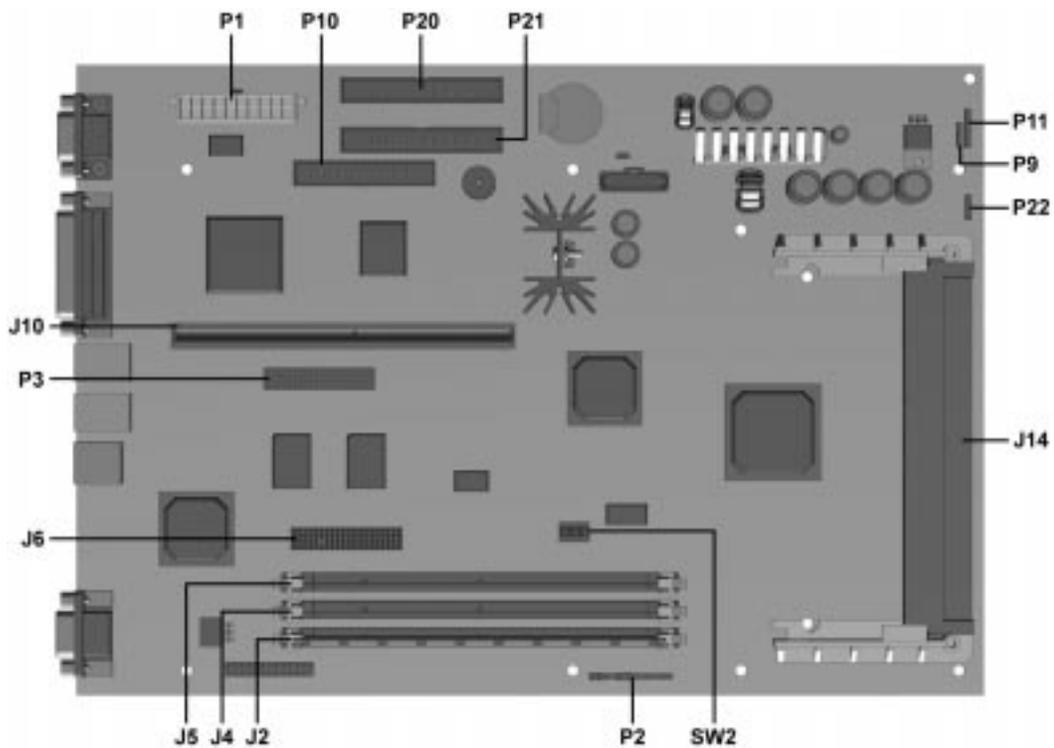
Figure 7-2. *Pentium II System Board Switch, Connector, and Jumper Locations*

Table 7-2
Pentium II System Board Connectors, Jumpers, and Switches

Device	Description
J2	DIMM Slot 1
J4	DIMM Slot 2
J5	DIMM Slot 3
J6	Graphics memory upgrade socket (used with P3)
J10	Riser board socket
J14	Microprocessor connector
P1	Power connector
P2	Clear CMOS header/Power-on password header/External (replacement) battery connector
P3	Graphics memory upgrade socket (used with J6)
P9	Fan connector
P10	Diskette cable connector
P11	LED connector
P20	Primary IDE/EIDE cable connector
P21	Secondary IDE/EDIE cable connector
P22	Alternate fan connector (Intel boxed processor)
SW2	Processor speed selector

7.1.2 Switch Settings

The following figures and tables identify the switch settings for each processor frequency for the Pentium and Pentium II system boards.

> ⚠ **CAUTION:** Do not configure the system board to operate faster than the speed at which the processor is rated. Doing this could result in unreliable operation or processor damage.
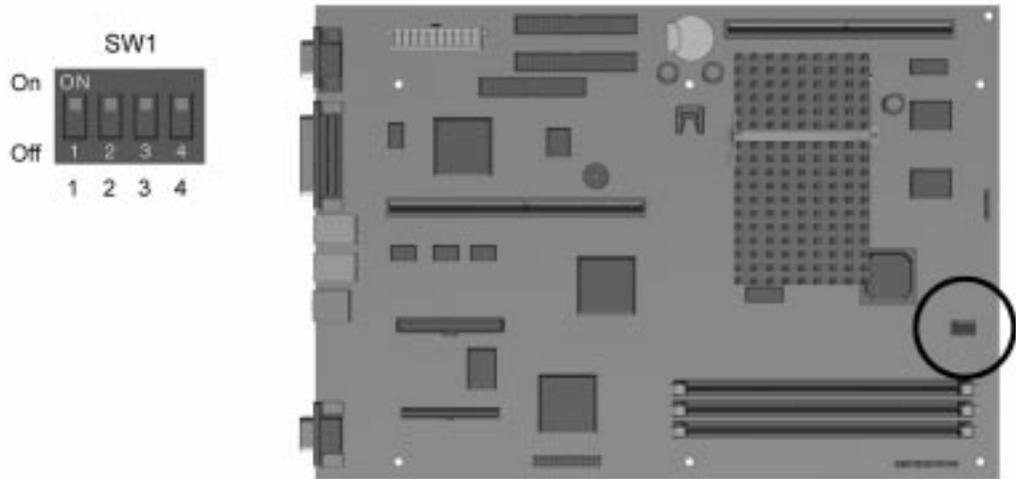
Figure 7-3. *SW1 Module Location, Pentium System Board*

Table 7-3
Pentium System Board SW1 Settings

S1	S2	Bus Speed	S3	S4	Processor Speed**
OFF	OFF	60	OFF	OFF	233
OFF	ON	66*	OFF	ON	200
ON	OFF	50	ON	ON	166
ON	ON	reserved			

* Standard bus speed for all Compaq Deskpro 2000 Series of Personal Computers.
** With bus speed set to 66 MHz.
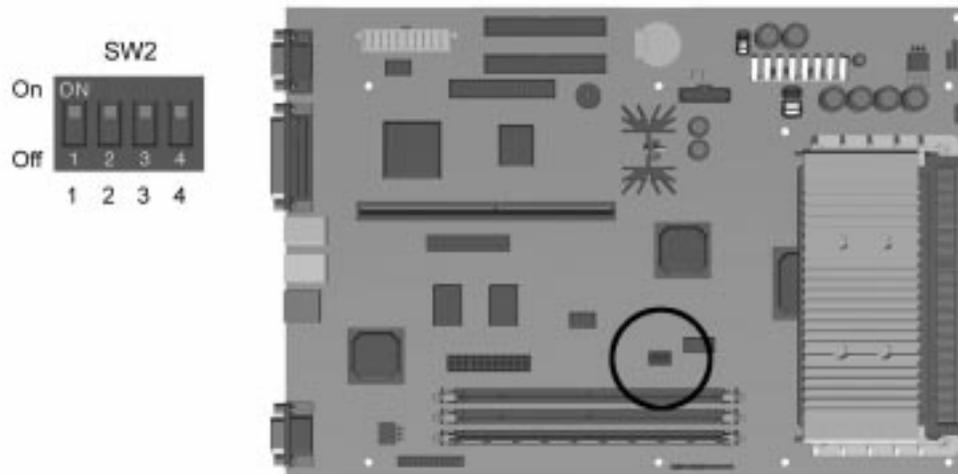
Figure 7-4. SW2 Module Location, Pentium II System Board

Table 7-4
Pentium II System Board Processor Speed Switch Settings

S1	S2	S3	S4	Processor Speed
ON	ON	OFF	OFF	233
ON	OFF	ON	ON	266
ON	OFF	ON	OFF	300

Note: The bus speed is hard wired to 66 MHz.

7.2 System Board Jumpers

This section provides information for setting jumpers for enabling/disabling passwords and clearing the configuration (CMOS). When you change a security feature, you will need to reset a jumper and reconfigure the computer to recognize this change. If the system configuration is incorrect, your computer may not work properly and you may receive error messages on the screen. Setting the system board jumpers is part of the reconfiguration process, along with running the Computer Setup utility.

✎ To change the system board jumpers, you must remove the system unit cover or access panel. For procedures on removing the system unit cover or access panel, refer to Chapter 5 for desktop computers and to Chapter 6 for minitower computers.

⚠ **CAUTION:** Be sure to turn off the computer before changing a jumper setting or damage to the system board can result.

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

7.2.1   Setting Power-On Password Jumpers

The power-on password feature is enabled or disabled by moving the jumper on the password header located on the system board. The password header is labeled "E6 Password" on the Pentium system board and labeled "Password" on the Pentium II system board.

The password header has three pins. The power-on password comes enabled by default with the jumper on pins 5 and 6. To clear or disable the power-on password, move the jumper to pins 6 and 7.
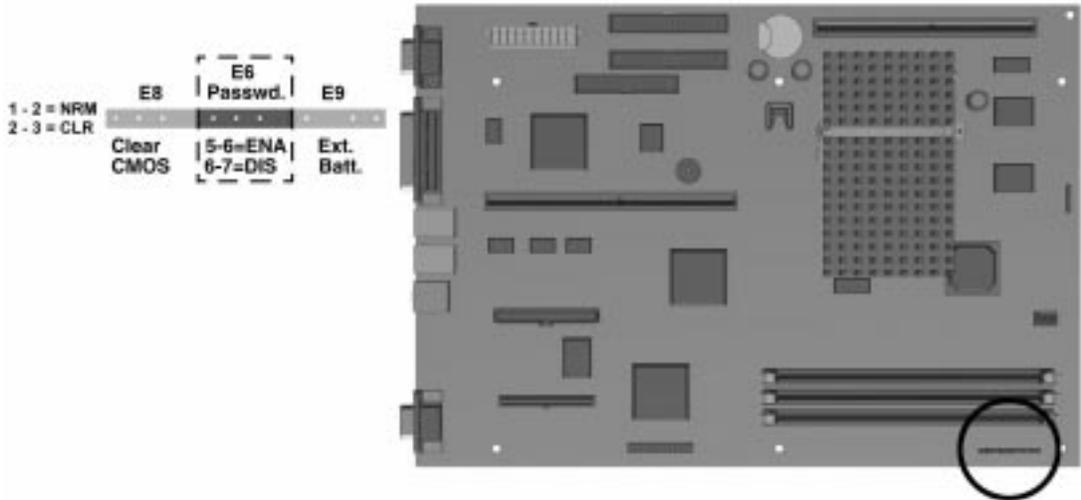
Figure 7-5. *Password Header (E6) Location, Pentium System Board*
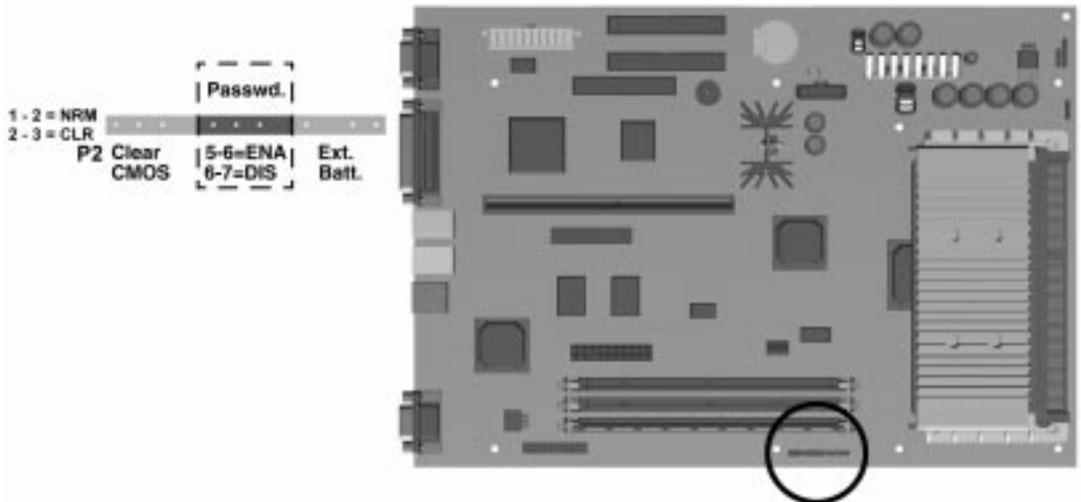
Figure 7-6. *Password Header Location, Pentium II System Board*

✎ To set a new password, move the password header back to pins 5 and 6, restart the computer, and reestablish your password through Security Management.

7.2.2   Clearing Configuration

The computer's configuration (CMOS) may occasionally be corrupted. If it does, it is necessary to clear the CMOS memory. The clear-CMOS header, located on the system board, is used for this function. The clear-CMOS header is labeled "E8 Clear CMOS" on the Pentium system board and labeled "Clear CMOS" on the Pentium II system board

To clear and reset the configuration, perform the following procedure:

1. Prepare the computer for disassembly by following the procedures specified in Section 5.3 or 6.3 for desktop or minitower computers, respectively.

2. Remove the hood or access panel (see Section 5.6 or 6.6.1).

3. Move the jumper on clear-CMOS header from pins 1 and 2 to pins 2 and 3 for five seconds; then replace the jumper on pins 1 and 2.
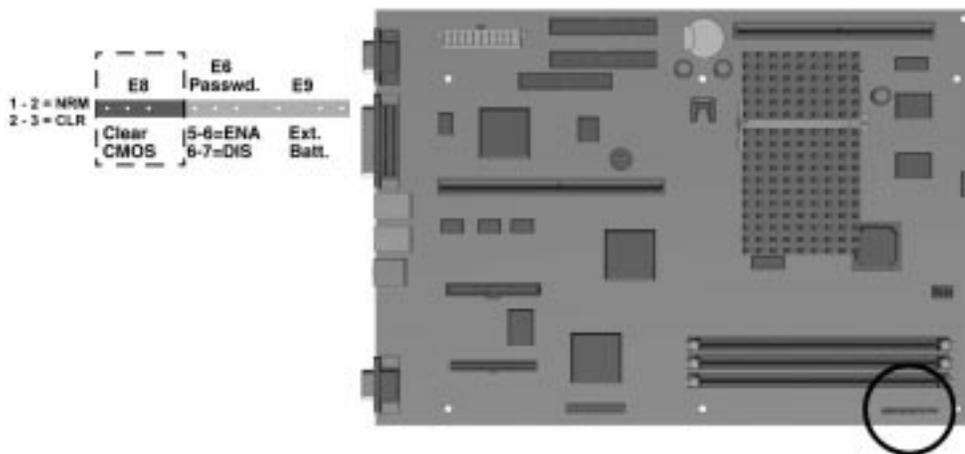
Figure 7-7. *Clear CMOS Header (E8) Location, Pentium System Board*
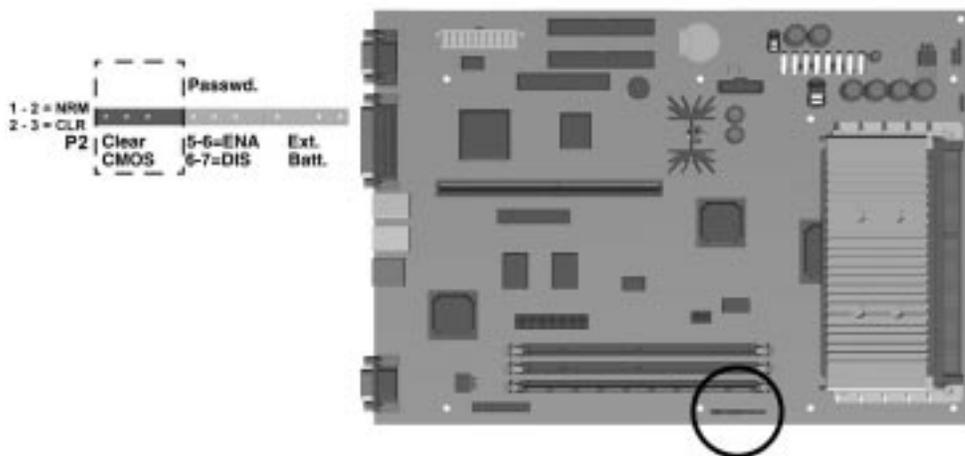
Figure 7-8. *Clear CMOS Header Location, Pentium II System Board*

4. Replace the cover and tighten the thumbscrews on the rear panel.

5. Turn the computer on.

6. Run the Computer Setup utility to reconfigure the system.

✎ When jumper on the clear-CMOS header is removed, the password becomes invalid because the password is stored in the configuration memory. You will need to reset the password.

7.2.3   Changing the Real-Time Clock (RTC) Battery

When installing the replacement RTC battery, the battery connector should be connected to the pins of the battery connector on the system board. The battery connector is labeled "E9 Ext. Batt." on the Pentium system board and labeled "Ext. Batt." on the Pentium II system board. The battery connector is keyed for proper installation.
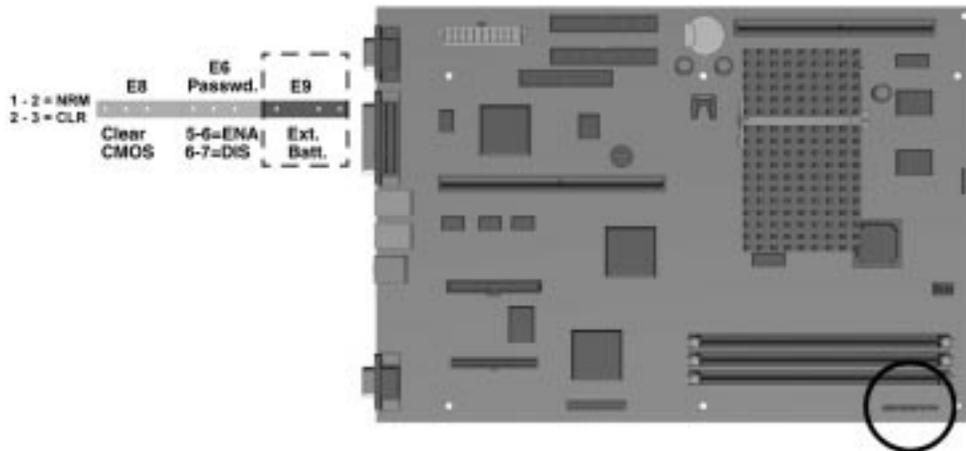
Figure 7-9. *Battery Connector (E9) Location, Pentium System Board*
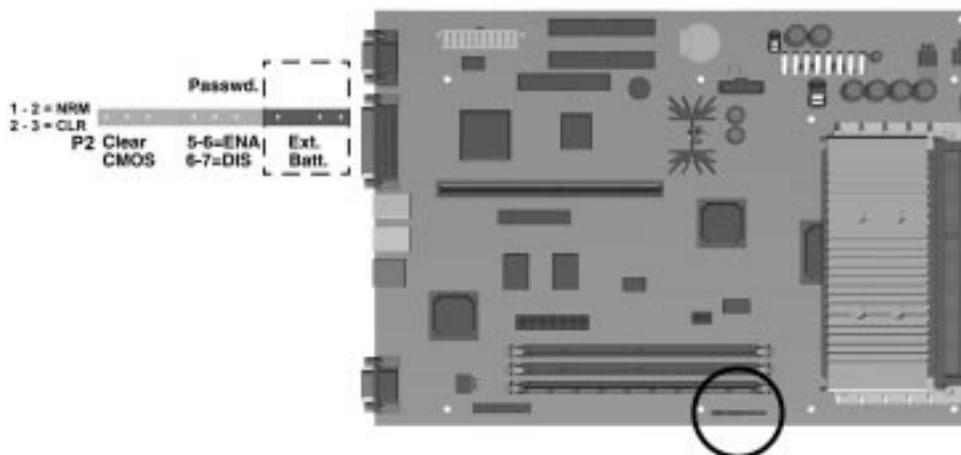
Figure 7-10. *Battery Connector Location, Pentium II System Board*

Refer to Chapter 5 or Chapter 6 for complete instructions on installing a replacement RTC battery.

7.3 Hard Drives

For more information about Compaq hard drives, refer to Appendix C in this guide. For more information about using SCSI devices, refer to Appendix D.

7.3.1   2.1-GB EIDE Hard Drive Jumper Settings
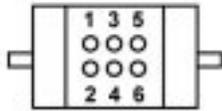
Figure 7-11. *2.1-GB Seagate EIDE Hard Drive Jumper Settings*

Table 7-5
Jumper Settings

Definition	Jumpers
Single	5 to 6
Primary	5 to 6 and 3 to 4
Secondary	No connection
Cable select	3 to 4

Figure 7-12. *2.1-GB Western Digital EIDE hard drive Jumper settings*

Table 7-6
Jumper Settings

Definition	Jumpers
Single	None
Primary	MA
Secondary	SL
Cable Select	CS

Figure 7-13. *2.1-GB Maxtor EIDE Hard Drive Jumper Settings*

Table 7-7
Jumper Settings

Description	MA	CS	WC	FR	CO
Single	J				
Primary in dual system	J				
Secondary in dual system	0				
Cable select		J			
Write cache enabled			J		
Reserved				0	
4032 cylinder option enabled					J
J = Jumper. 0 = No jumper.					

7.3.2   3.2-GB EIDE Hard Drive Jumper Settings
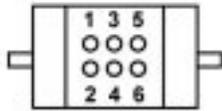
Figure 7-14. *3.2-GB Seagate EIDE Hard Drive Jumper Settings*

Table 7-8
Jumper Settings

Definition	Jumpers
Single	5 to 6
Primary	5 to 6 and 3 to 4
Secondary	No connection
Cable select	3 to 4

Figure 7-15. *3.2-GB Western Digital EIDE Hard Drive Jumper settings*

Table 7-9
Jumper Settings

Definition	Jumpers
Single	None
Primary	MA
Secondary	SL
Cable Select	CS

Figure 7-16. *3.2-GB Maxtor EIDE Hard Drive Jumper Settings*

Table 7-10
Jumper Settings

Description	MA	CS	WC	FR	CO
Single	J				
Primary in dual system	J				
Secondary in dual system	0				
Cable select		J			
Write cache enabled			J		
Reserved				0	
4032 cylinder option enabled					J
J = Jumper. 0 = No jumper.					

7.3.3 Optional Ultra SCSI Hard Drive Jumper Settings
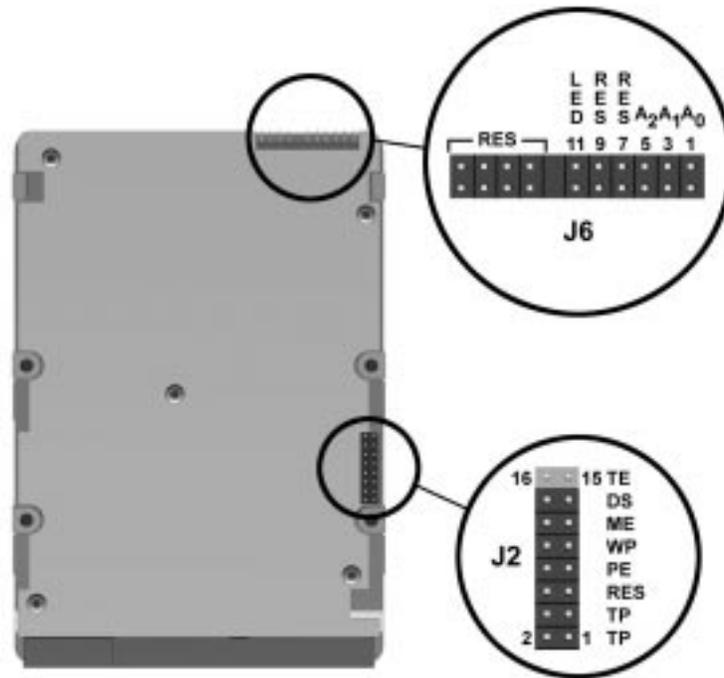
Figure 7-17. *2.1-GB Ultra SCSI Hard Drive Jumper Settings*

Table 7-11
Jumper Settings

Jumper J2			Jumper J6			
Definition	Jumper	Pins	Definition	A0	A1	A2
Enable Terminators	TE	15 & 16	SCSI ID = 0	Off	Off	Off
Delay Motor Start	DS	13 & 14	SCSI ID = 1	On	Off	Off
Enable Motor Start	ME	11 & 12	SCSI ID = 2	Off	On	Off
Write Protect	WP	9 & 10	SCSI ID = 3	On	On	Off
Disable Parity	PE	7 & 8	SCSI ID = 4	Off	Off	On
Reserved	RES	none	SCSI ID = 5	On	Off	On
Termination Power from Drive	TP	3 & 4	SCSI ID = 6	Off	On	On
Termination Power to SCSI Bus	TP	1 & 2	SCSI ID = 7	On	On	On
Termination Power from SCSI Bus		2 & 4				
All other pins of Jumper J6 reserved for other uses.						
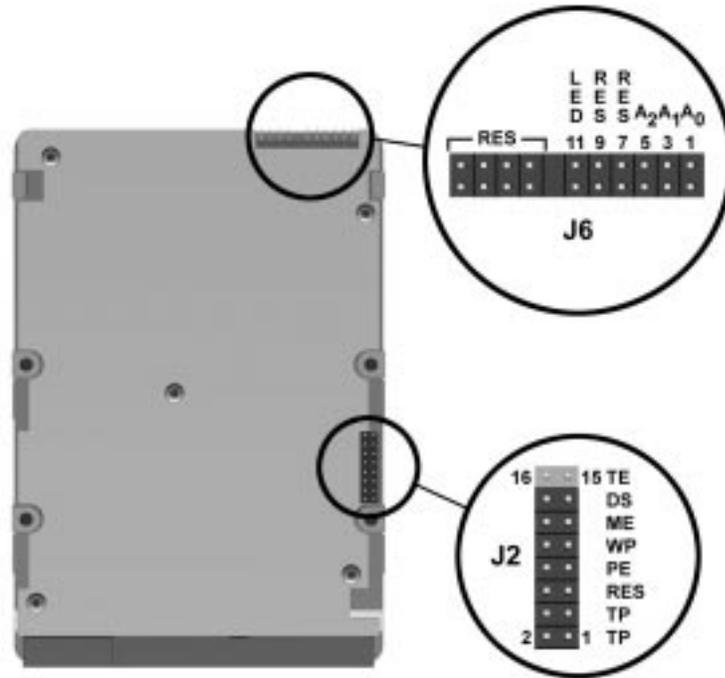
Figure 7-18. *4.3-GB Ultra SCSI Hard Drive Jumper Settings*

Table 7-12
Jumper Settings

Jumper J2		Jumper J6			
Definition	**Jumper**	**Definition**	**A0**	**A1**	**A2**
Enable Terminators	TE	SCSI ID = 0	Off	Off	Off
Delay Motor Start	DS	SCSI ID = 1	On	Off	Off
Enable Motor Start	ME	SCSI ID = 2	Off	On	Off
Write Protect	WP	SCSI ID = 3	On	On	Off
Disable Parity	PE	SCSI ID = 4	Off	Off	On
Reserved	RES	SCSI ID = 5	On	Off	On
Termination Power from Drive	TP	SCSI ID = 6	Off	On	On
Termination Power from SCSI Bus	TP	SCSI ID = 7	On	On	On
All other pins of Jumper J6 reserved for other uses.					

7.3.4 Optional Ultra ATA Hard Drives Jumper Settings

Figure 7-19. *2.1-GB Maxtor Ultra ATA Hard Drive Jumper Settings*

Table 7-13
Jumper Settings

Description	MA	CS	WC	FR	CO
Single	J				
Primary in dual system	J				
Secondary in dual system	0				
Cable select		J			
Write cache enabled			J		
Reserved				0	
4032 cylinder option enabled					J
J = Jumper . 0 = No jumper.					

Figure 7-20. *2.4-GB Ultra ATA Hard Drive Jumper Settings*

Table 7-14
Jumper Settings

Definition	Pins
Primary	1 to 2 and 3 to 5
Secondary	3 to 5
Cable Select	2 to 4 and 3 to 5

Figure 7-21. *3.2-GB Maxtor Ultra ATA Hard Drive Jumper Settings*

Table 7-15
Jumper Settings

Description	MA	CS	WC	FR	CO
Single	J				
Primary in dual system	J				
Secondary in dual system	0				
Cable select		J			
Write cache enabled			J		
Reserved				0	
4032 cylinder option enabled					J
J = Jumper. 0 = No jumper.					

7.4 CD-ROM Drive Jumper Settings

Figure 7-22. *Jumper Pins for the 16X max EIDE CD-ROM Drives*

Table 7-16
Jumper Settings

Definition	Jumper
Primary	MA
Secondary	SL
Cable select	CS

7.5 Optional PD-CD Drives

For more information about SCSI devices, refer to Appendix D.

7.5.1 SCSI PD-CD Drive Jumper Settings

PD/CDROM - SCSI
Assembly Number 184689-201

1 2 3 4 5 6 7

Default Settings Shown

Jumper	Description	Setting
1	LUN enabled	Off
2	SCSI ID jumper	On
3	SCSI ID jumper	Off
4	SCSI ID jumper	On
5	Blank	Not Used
6	Terminators disabled	Off
7	Term power enabled	On
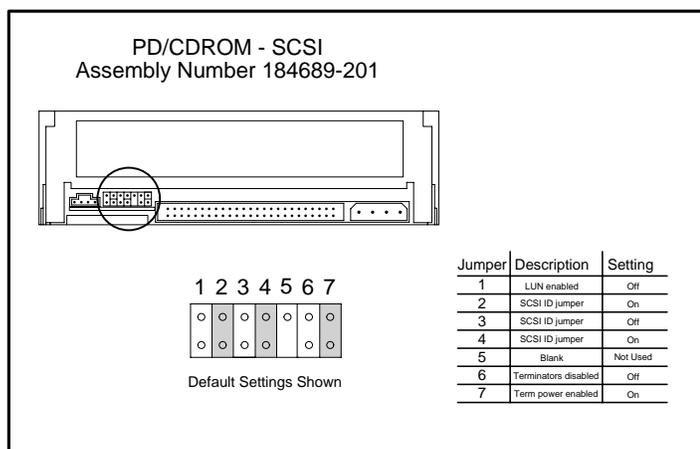
Figure 7-23. *Jumper Pins for the PD-CD Drive*

7.6 Diskette Drive
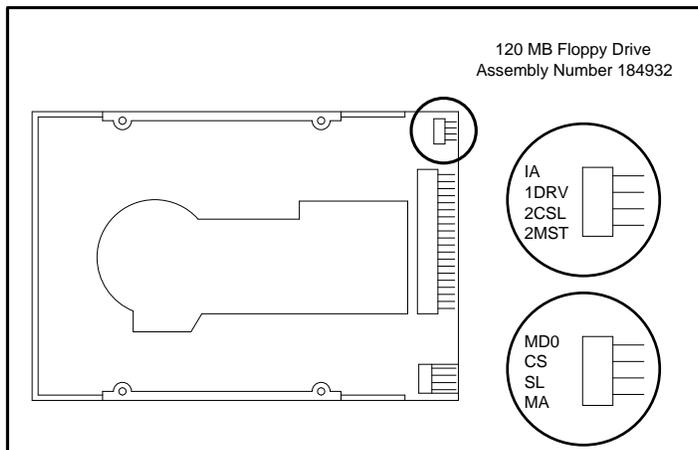
Figure 7-24. *LS-120 Diskette Drive Jumper Settings*

Table 7-17
Jumper Settings (Top Insert)

Setting	IA	1DRV	2CSL	2MST
Cable Select	Off	Off	On	Off
Device 0 (Primary)	Off	Off	Off	On
Device 1 (Secondary)	Off	Off	Off	Off

Jumper **IA** is for factory use only.
Jumper **1DRV** does not need to be used.

Jumper Settings (Bottom Insert)

Setting	MD0	CS	SL	MA
Cable Select	Off	On	Off	Off
Device 0 (Primary)	Off	Off	Off	On
Device 1 (Secondary)	Off	Off	On	Off

Jumper **MD0** is for factory use only.

chapter 8

SPECIFICATIONS

This chapter provides physical, environmental, and performance specifications for the computer, keyboard, and mass storage devices.

8.1 System

Table 8-1
Desktop System Specifications

	U. S.	Metric
Dimensions		
Height	5.0 in	12.7 cm
Width	17.71 in	44.98 cm
Length	16.72 in	42.47 cm
Weight	23.7 lb	10.74 kg
System Power Rating	145 W	145 W
Power Supply		
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-120 VAC	200-240 VAC
Rated Line Frequency	50 - 60 Hz	50 - 60 Hz
Rated Input Current (maximum)	5.5 A	3 A
Rated Output Power	200 W	200 W
Environmental Requirements		
Temperature		
Operating	50° to 95°F	10° to 35°C
Shipping	-4° to 140°F	-20° to 60°C
Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Heat Dissipation (nominal)	770 Btu/hr	3.23 kg-cal/min

Table 8-2
Minitower System Specifications

	U. S.	Metric
Dimensions		
Height	18.49 in	46.96 cm
Width	7.31 in	18.57 cm
Depth	16.89 in	42.90 cm
Weight	34.0 lb	15.40 kg
System Power Rating	185 W	185 W
Power Supply		
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-120 VAC	200-240 VAC
Rated Line Frequency	50 - 60 Hz	50 - 60 Hz
Rated Input Current (maximum)	5.5 A	3 A
Rated Output Power	200 W	200 W
Environmental Requirements		
Temperature		
Operating	50° to 95°F	10° to 35°C
Shipping	-4° to 140°F	-20° to 60°C
Humidity (noncondensing)		
Operating	8% to 90%	8% to 90%
Nonoperating	5% to 95%	5% to 95%
Maximum Altitude (unpressurized)		
Operating	10,000 ft	3048 m
Nonoperating	30,000 ft	9144 m
Heat Dissipation (nominal)	1060 Btu/hr	4.45 kg-cal/min

Table 8-3
System Interrupts

Hardware IRQ	System Function
IRQ 0	Timer Interrupt (Not on ISA Bus)
IRQ 1	Keyboard (Not on ISA Bus)
IRQ 2	Interrupt Controller Cascade (Not on ISA Bus)
IRQ 3	Unused
IRQ 4	Serial Port (COM 1)
IRQ 5	Enhanced Business Audio (Default; Alternate = IRQ 7, IRQ 9, IRQ 10, None)
IRQ 6	Diskette Drive
IRQ 7	Parallel Port (LPT 1)
IRQ 8	Real-Time Clock (Not on ISA Bus)
IRQ 9	Unused
IRQ 10	Unused
IRQ 11	PCI Interrupt
IRQ 12	Mouse
IRQ 13	Coprocessor (Not on ISA Bus)
IRQ 14	IDE Interface (Hard Disk and Primary IDE Drive)
IRQ 15	CD-ROM (Secondary IDE/Drive)

Table 8-4
System DMA

Hardware DMA	System Function
DMA 0	Unused
DMA 1	Business Audio (Default; Alternate = DMA 0, DMA 3, None)
DMA 2	Diskette Drive
DMA 3	ECP Parallel Port LPT1 (Default; Alternate = DMA 0)
DMA 4	DMA Controller Cascading (Not on ISA Bus)
DMA 5	Unused
DMA 6	Unused
DMA 7	Unused

Table 8-5
System I/O

I/O Address (Hex)	System Function (Shipping Configuration)
000 - 00F	DMA Controller # 1
010 - 01F	Unused
020 - 03F	Interrupt Controller # 1
040 - 043	Counter/Timer
044 - 05F	Unused
060	Keyboard Controller
061	Port B
062 - 063	Unused
064	Keyboard Controller
065 - 06F	Unused
070 - 071	NMI Enable/Real-Time Clock
072 - 07F	Unused
080 - 08F	DMA Page Registers
090 - 091	Unused
092	Port A
093 - 09F	Unused
0A0 - 0BF	Interrupt Controller # 2
0C0 - 0DF	DMA Controller # 2
0E0 - 0EB	Unused
0EC - 0ED	483 Configuration Index/Data
0EE - 0EF	483 Fast A20/Fast Reset
0F0 - 0F1	Co-Processor Busy Clear/Reset
0F2 - 0F3	Unused
0F4 - 0F5	483 CPU Speed Slow/Fast
0F6 - 0F8	Unused
0F9	483/PGL Configuration Lock
0FA	Unused
0FB	483/PGL Configuration Unlock
0FC - 0FF	Unused
100 - 12F	Unused
130 - 131	Modem PGL Index/Data (Default; Alt = 140h, 260h, 270h)
132 - 16F	Unused
170 - 177	Reserved
178 - 1EF	Unused
1F0 - 1F7	Fixed Disk Controller
1F8 - 1FF	Unused
200	Unused
201	Unused

Continued

Table 8-5 *continued*

I/O Address (Hex)	System Function (Shipping Configuration)
202 - 21F	Unused
220 - 22F	Business Audio (Default; Alternate = 240h, 260h, 280h)
230 - 277	Unused
278 - 27F	Reserved Parallel Port
280 - 2E7	Unused
2E8 - 2EF	Reserved Serial Port
2F0 - 2F7	Unused
2F8 - 2FF	Modem (COM 2)
300 - 317	Unused
318 - 319	Unused
31A - 36F	Unused
370 - 377	Reserved (2nd Diskette Drive)
378 - 37F	Parallel Port (Primary)
380 - 387	Unused
388 - 38B	FM Synthesizer - OPL3
38C - 397	Unused
398 - 399	Super AI/O Index/Data (Default; Alternate = 26Eh, 15Ch, 02Eh)
39A - 3AF	Unused
3B0 - 3BB	MDA, EGA/VGA
3BC - 3BF	Reserved (Parallel Port)
3C0 - 3DF	EGA/VGA
3E0 - 3E7	Unused
3E8 - 3EF	Reserved (Serial Port)
3F0 - 3F7	Diskette Controller
3F8 - 3FF	Serial Port (Primary)

Table 8-6
System Memory Map

Size	Memory Address	System Function
256 KB	FFFFFFFFh to FFFC0000h	System ROM
2,080,512 KB	FFFBFFFFh to 81000000h	PCI Memory Expansion
16 MB	80FFFFFFh to 80000000h	ISA Memory Mapped I/O Devices
1792 MB	7FFFFFFFh to 10000000h	PCI Memory Expansion
240 MB	0FFFFFFFh to 01000000h	HOST or PCI Memory Expansion
15 MB	00FFFFFFh to 00100000h	HOST, PCI, or ISA Memory Expansion
64 KB	00EFFFFFh to 000F0000h	System ROM
64 KB	000EFFFFh to 000E0000h	Unused
96 KB	000DFFFFh to 000C8000h	Unused
6 KB	000C7FFFh to 000C6000h	Video ROM
2 KB	000C67FFh to 000C6000h	Unused
24 KB	000C5FFFh to 000C6000h	Video ROM
128 KB	000BFFFFh to 000A0000h	Video RAM
640 KB	0009FFFFh to 00000000h	Base Memory

All memory above the first 256 MB is non-cacheable. All PCI memory is non-cacheable.

8.2 Drives

Table 8-7 1.44 MB Diskette Drive	
Size and Capacity	
Size (in)	3.5
High Density (MB)	1.44
Low Density (KB)	720
Compaq Spare Part Number	160788-201
Light	Green
Height	One-third
Bytes per Sector	512
Sectors per Track	
High Density	18
Low Density	9
Tracks per Side	
High Density	80
Low Density	80
Read/Write Heads	2
Average Seek Time (Mb/s)	
Track-to-Track (high/low)	3/6
Average (high/low)	94/173
Latency Average (ms)	100

Table 8-8
Hard Drives

IDE/EIDE

	2.1-GB	3.2-GB
Formatted Capacity		
Physical (MB)	2111.86	3209.0
Logical (MB)	2111.86	3209.0
Compaq Spare Part Number	278745-001	278746-001
Drive Type	65	65
Transfer Rate		
Interface (Mbytes/sec)	16.7	16.7
Typical Seek Time (including settling)		
Single Track (ms)	3.0	2.0
Average (ms)	12.0	12.0
Full Stroke (ms)	22.0	25.0
Disk Rotational Speed (rpm)	4500	4500
Cylinders		
Logical	4092	6218
Data Heads		
Logical	16	16
Sectors per Track		
Logical	63	63
Buffer Size (KB)	128	128

Ultra ATA (UDMA)

	2.1-GB	3.2-GB	3.2-GB
Formatted Capacity			
Physical (MB)	2160.0	3240.0	3240.0
Logical (MB)	2160.0	3240.0	3240.0
Compaq Spare Part Number	278287-001	278288-001	278297-001
Drive Type	65	65	65
Transfer Rate			
Interface (Mbytes/sec)	33.3	33.3	33.3
Typical Seek Time (including settling)			
Single Track (ms)	3.0	2.0	1.0
Average (ms)	12.0	12.0	9.7
Full Stroke (ms)	22.0	25.0	21.0
Disk Rotational Speed (rpm)	4500	4500	5400
Cylinders			
Logical	4092	6218	6218
Data Heads			
Logical	16	16	16
Sectors per Track			
Logical	63	63	63
Buffer Size (KB)	128	128	128

✎ Because "Compaq Utilities" is installed on a hidden partition on the hard drive, hard drive capacity will appear reduced when displayed by the computer.

Table 8-9
Ultra SCSI Hard Drives

	2.1 GB	4.3 GB
Formatted Capacity		
Physical (MB)	2.16	4.6
Logical (MB)	2.10	4.3
Compaq Spare Part Number	247409-001	247408-001
Transfer Rate		
Media (MB/sec)	62.5 - 103.4	83.2 - 139.3
Interface (MB/sec)	20.0	20.0
Typical Seek Time (including settling)		
Single Track (ms)	1.2	1.0
Average (ms)	8.5	8.0
Full Stroke (ms)	15.0	18.0
Disk Rotational Speed (rpm)	5400	7200
Cylinders		
Physical	8209	6144
Data Heads		
Physical	3	8
Sectors per Track		
Physical	132 - 211	126 - 216
Buffer Size (KB)	512	512

Table 8-10
CD-ROM Drives

	16X Max	24X Max
Applicable Disc		
	CD-ROM mode1, mode 2	CD-ROM mode1, mode 2
	Mixed mode (audio and data combined)	Mixed mode (audio and data combined)
	CD-DA	CD-DA
	Photo CD (single and multi-session)	Photo CD (single and multi-session)
	CDi ready	CDi ready
	CD-XA ready	CD-XA ready
Compaq Spare Part Number	278791-001	278026-001
Disc Diameter	12 cm, 8 cm	12 cm, 8 cm
Capacity	550 MB (Mode 1, 12 cm)	550 MB (Mode 1, 12 cm)
	640 MB (Mode 2, 12 cm)	640 MB (Mode 2, 12 cm)
	180 MB (8 cm)	180 MB (8 cm)
Center Hole	15 mm diameter	15 mm diameter
Disc Thickness	1.2 mm	1.2 mm
Track Pitch	1.6 µm	1.6 µm
Laser		
Beam Divergence	53.5 degrees +/- 1.5 degrees	53.5 degrees +/- 1.5 degrees
Output Power	0.14 mW	0.14 mW
Type	Semiconductor laser GaAlAs	Semiconductor laser GaAlAs
Wave Length	790 nm +/- 25 nm	790 nm +/- 25 nm
Access Time		
Random	100 ms	100 ms
Full Stroke	200 ms	150 ms
Audio Output Level	0.7V (RMS) (typical)	0.7V (RMS) (typical)
Cache Buffer	128 KB	128 KB
Data Transfer Rate		
Sustained	2400 KB/s	1200 to 3600 KB/s

Table 8-11
PD-CD Drive

	4X	8X
Compaq Spare Part Number	184691-201	185951-001
Disc		
Application Disc		
CD-ROM	Mode 1 & 2, CD-DA	Mode 1 & 2, CD-DA
CD-XA	Mode 2, Form 1 & 2	Mode 2, Form 1 & 2
CD-I	Mode 2, Form 1 & 2	Mode 2, Form 1 & 2
CD-I Ready	CD-Bridge	CD-Bridge
Photo CD	Single & Multi session	Single & Multi session
CD-WO	Fixed and Variable packets	Fixed and Variable packets
Capacity		
CD-ROM Mode 1	550 MB (12 cm)	550 MB (12 cm)
CD-ROM Mode 2	640 MB (12cm), 180 MB (8 cm)	640 MB (12cm), 180 MB (8 cm)
PD	650 MB, ZCAV	650 MB, ZCAV
Diameter	12 cm, 8 cm (CD-ROM only)	12 cm, 8 cm (CD-ROM only
Thickness	1.2 mm	1.2 mm
Track Pitch	1.6 ìm (CD) 1.2 ìm (PD)	1.6 ìm (CD) 1.2 ìm (PD)
Laser		
Output Power	13.5 mW +/- 2.0 mW	13.5 mW +/- 2.0 mW
Type	Semiconductor Laser GaA1As	Semiconductor Laser GaA1As
Wave Length	790 +/- 25 nm	790 +/- 25 nm
Access Time		
Random	< 240-ms	< 150 ms
Full Stroke	< 350-ms (PD mode)	< 350 ms (PD mode)
Cache/Buffer	256 Kbytes	512 Kbytes
Data Transfer Rate		
CD	600 Kb/sec	1200 Kb/sec
PD	500-1100 Kb/sec	500-1100 Kb/sec
Error Rates		
Soft error	10^{-9}	10^{-9}
Hard error	10^{-12}	10^{-12}
Seek error	10^{-6}	10^{-6}

Continued

Table 8-11 *Continued*

Indicators			
Busy LED		Green = Drive ready and media is inserted Amber = Media access	Green = Drive ready and media is inserted Amber = Media access
Mode LED		Amber = PD, Green = CD	Amber = PD, Green = CD
Reliability		35,000 POH, 25% (MTBF) 30 minutes (MTTR) 5 years (service life) > 20,000 drawer in/out cycles > 3×10^6 full stroke seeks	35,000 POH, 25% (MTBF) 30 minutes (MTTR) 5 years (service life) > 20,000 drawer in/out cycles > 3×10^6 full stroke seeks
Bus Type		SCSI	ATAPI
Startup Time		< 7 seconds (typical)	< 7 seconds (typical)
Stop Time		< 3 seconds (typical)	< 3 seconds (typical)
Environmental Conditions			

Power Requirement	+5VD	Tolerance +/- 10%
		Ripple 100 mVp-p
		Current 1.2 A (typical)
		           1.5 A (maximum)
		< 250 mA (spun-down)
			Tolerance +/- 10%
			Ripple 100 mVp-p
			Current 1.2 A (typical)
			           1.5 A (maximum)
			< 250 mA (spun-down)

	+12VDC C	Tolerance +/- 5% Ripple 200 mVp-p Current< 600 mA (hold) < 1500 mA (seek, spin-up) < 100 mA (spun-down)	Tolerance +/- 5% Ripple 200 mVp-p Current< 600 mA (hold) < 1500 mA (seek, spin-up) < 100 mA (spun-down)
Physical Characteristics			
Dimensions (excluding projections)		5.72-in × 1.69-in × 7.92-in (146 mm × 42.9 mm × 201 mm) (w/h/d)	5.72-in × 1.69-in × 7.92-in (146 mm × 42.9 mm × 201 mm) (w/h/d)
Weight		< 2.43 lb (< 1100 g)	< 2.43 lb (< 1100 g)

Table 8-12
LS-120 Drive

Compaq Spare Part Number

Internal	263709-002
External	294158-001

Physical Characteristics

Height	1.00-in (25.4-mm)
Width	4.00-in, (101.6-mm)
Length	5.91-in (150.0-mm)
Weight (w/eject motor)	1.19-lb (540-gm)

Environmental Factors	**Operating**	**Non-Operating**
Temperature	50°F to 68°F (10°C to 45°C)	-22°F to 140°F (-30°C to 60°C)
Relative humidity (non-condensing)	10% to 80%	5% to 95%
Wet bulb, max	84°F (29°C)	
Shock	6 G, 11 msec, 1/2 sine	140 G, 2 msec, 1/2 sine
Vibration	0.5 G pk swept sine, 10 Hz to 500 Hz	2.0 G pk swept sine, 10 Hz to 500 Hz
Altitude	1,635 yd (1500 M)	4,905 yd (4500 M)

Physical Configuration

Actuator type	Single stage, linear voice-coil
Number of disks	1
Data surfaces	2
Data head assemblies	2
Tracking and positioning	Continuous optical
Optical transducers	1

Drive Performance

Disk rotational speed	720 ± 3 revolutions per minute
Average latency	42 ms
Average command overhead	1 ms
Transfer rate to/from buffer	4 MB/sec maximum
Load/unload cycles	30,000
Buffer size	4 K

Specified Modes

Track to track seek time	25 ms
Average seek time	70 ms
Maximum seek time	150 ms
Start time (power up)	1 sec
Stop time	1 sec
Transfer rate (to/from media)	3.2 to 5.4 Mbits/sec

Acoustic Noise	47 dBA at 1 meter

Electromagnetic interference	6 Oersteds (max)

8.3 Audio System

Table 8-13
Audio System

Compaq Business Pro Audio Board	
Compaq Spare Part Number	278792-001
Sampling Rate	5.51 KHz to 44 KHz (adjustable)
Maximum Voltage (rms)	
Microphone-in	0.030
Headphone-out	n/a
Line-in	0.7
Line-out	0.7
Output Power	
Headphone-out*	60 mW (R_L = 32 ohms)
Internal speaker	1 W (R_L = 8 ohms)
Impedance (nominal)	
Microphone-in	1-K ohm
Headphone-out	16 ohms (min.)
Line-in	20-K ohms
Line-out	20-K ohms
Internal speaker	8 ohms
Speaker	
Frequency response	450 Hz to 4000 Hz
Data Types	
alaw	8-/16-bit
μlaw	8-/16-bit
mono/stereo	16-bit

*Not suitable for unpowered speakers.

8.4 Keyboard

Table 8-14
Compaq Enhanced Keyboard

	U.S.	Metric
Dimensions		
Height	1.3 in	3.3 cm
Width	18.3 in	46.5 cm
Depth	6.4 in	16.1 cm
Weight	3.0 lb	1.4 kg

8.5 Mouse

Table 8-15
2-Button Mouse

	U.S.	Metric
Dimensions		
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	400 dpi
Tracking Speed (maximum)	10 in/sec	25 cm/sec
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	10% to 90%, noncondensing
ESD	No soft errors through 10 kV;	
	No hard errors through 15 kV; specific performance depends on host system	

8.6 Supported Graphics Resolutions

Table 8-16
S3 Trio64V2/GX

Resolution	Maximum Refresh Rate, Hz	1-MB SGRAM Colors Supported	2-MB SGRAM Colors Supported
640 × 480	85	16.7-M	16.7-M
800 × 600	85	65-K	16.7-M
1024 × 768	85	256	65-K
1280 × 1024	75	N/A	256

Table 8-17
MPEG1 Graphics Controller

Resolution	Ma×imum Refresh Rate, Hz	1-MB SGRAM Colors Supported	2-MB SGRAM Colors Supported
640 × 480	85	16.7-M	16.7-M
800 × 600	85	65-K	16.7-M
1024 × 768	85	256	65-K
1280 × 1024	75	N/A	256

Table 8-18
Matrox MGA-1064SG Embedded Graphics Controller

Resolution	2-MB SGRAM Colors Supported	4-MB SGRAM Colors Supported
640 × 480	16.7M	16.7M
800 × 600	16.7M	16.7M
1024 × 768	64K	16.7M
1152 × 864	64K	16.7M
1280 × 1024	256	16.7M
1600 × 1200	256	64K

Table 8-19
Matrox Millennium II PCI Board

Resolution	2-MB WRAM Colors Supported	4-MB WRAM Colors Supported	8-MB WRAM Colors Supported
640 × 480	16.7M	16.7M	16.7M
800 × 600	16.7M	16.7M	16.7M
1024 × 768	64K	16.7M	16.7M
1152 × 864	64K	16.7M	16.7M
1280 × 1024	256	16.7M	16.7M
1600 × 1200	256	64K	16.7M

appendix A

CONNECTOR PIN ASSIGNMENTS

This appendix contains the pin assignments for all external connectors:

Table A-1 Keyboard		
Connector and Icon (Orange)	**Pin**	**Signal**
	1	Data
	2	Unused
	3	Ground
	4	+5 VDC
	5	Clock
	6	Unused

Table A-2 Mouse		
Connector and Icon (Green)	**Pin**	**Signal**
	1	Data
	2	Unused
	3	Ground
	4	+5 VDC
	5	Clock
	6	Unused

Table A-3
Parallel Interface
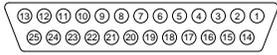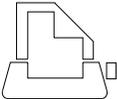
Connector and Icon	Pin	Signal
	1	Strobe
	2	Data Bit 0
	3	Data Bit 1
	4	Data Bit 2
	5	Data Bit 3
	6	Data Bit 4
	7	Data Bit 5
	8	Data Bit 6
	9	Data Bit 7
	10	Acknowledge
	11	Busy
	12	Paper End
	13	Select
	14	Auto Linefeed
	15	Error
	16	Initialize Printer
	17	Select IN
	18-25	Signal Ground

Table A-4
Serial Interfaces
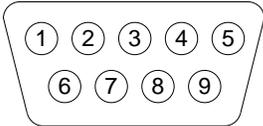
Connector and Icon	Pin	Signal
	1	Carrier Detect
	2	Receive Data
	3	Transmit Data
	4	Data Terminal Ready
	5	Signal Ground
	6	Data Set Ready
	7	Request to Send
	8	Clear to Send
	9	Ring Indicator

Table A-5
Monitor

Connector		Pin	Signal
		1	Red Analog
		2	Green Analog
		3	Blue Analog
		4	Monitor ID Bit2
		5	Ground
		6	Ground Analog
		7	Ground Analog
		8	Ground Analog
		9	Not Connected
		10	Ground
		11	Monitor ID Bit 0
		12	Bidirectional Data (SDA)*
		13	Horizontal Sync
		14	Vertical Sync
		15	Data Clock (SCL)*
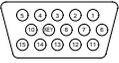
*For DDC support (I^2C monitors).

Table A-6
Ethernet RJ-45
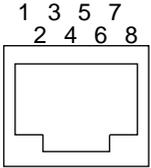
Connector and Icon		Pin	Signal
		1	(+) Transmit Data
		2	(-) Transmit Data
		3	(+) Receive Data
		4	Unused
		5	Unused
		6	(-) Receive Data
		7	Unused
		8	Unused

Table A-7
Ethernet BNC
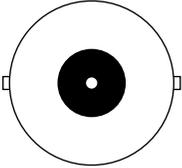
Connector and Icon		Pin	Signal
		1 (Inside)	Data
		2 (Outside)	Ground

Table A-8
Ultra-Wide SCSI Connector
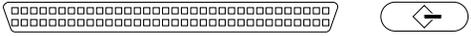
Connector and Icon		Pin	Signal
		1-16	Ground
		17 - 18	TERMPWR
		19	Reserved
		20 - 34	Ground
		35	D12
		36	D13
		37	D14
		38	D15
		39	DP1
		40	D0
		41	D1
		42	D2
		43	D3
		44	D4
		45	D5
		46	D6
		47	D7
		48	DP0
		49 - 50	Ground
		51 - 52	TERMPWR
		53	Reserved
		54	Ground
		55	ATN
		56	Ground
		57	BSY
		58	ACK
		59	RST
		60	MSG
		61	SEL
		62	C/D
		63	REQ
		64	I/O
		65	D8
		66	D9
		67	D10
		68	D11

Table A-9
Line-In Audio Connector

Connector and Icon	Pin	Signal
	1 (Outside)	Ground
	2 (Inside)	Left Channel Data
	3 (Inside)	Right Channel Data

Table A-10
Line-Out Audio Connector

Connector and Icon	Pin	Signal
	1 (Outside)	Ground
	2 (Inside)	Left Channel Data
	3 (Inside)	Right Channel Data

Table A-11
Microphone Connector

Connector and Icon (Blue)	Pin	Signal
	1 (Outside)	Ground
	2 (Inside)	Left Channel Data
	3 (Inside)	not supported
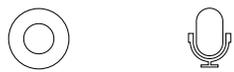
Table A-12
Headphone Connector

Connector and Icon	Pin	Signal
	1 (Outside)	Ground
	2 (Inside)	Left Channel Data
	3 (Inside)	Right Channel Data

Table A-13
USB Connector

Connector and Icon	Pin	Signal
	1	VCC
	2	- Data
	3	+ Data
	4	Ground

Table A-14
IDE/EIDE Drive Cable
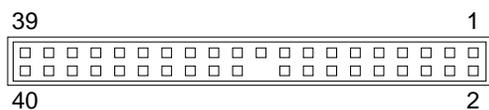
Pin	Signal	Pin	Signal
1	RESET	21	DREQ
2	GND	22	GND
3	DD7	23	DIOW
4	DD8	24	GND
5	DD6	25	DIOR
6	DD9	26	GND
7	DD5	27	IORDY
8	DD10	28	Cable Select
9	DD4	29	DMACK
10	DD11	30	GND
11	DD3	31	INTRQ
12	DD12	32	IOCS16
13	DD2	33	DA1
14	DD13	34	PDIA6
15	DD1	35	DA0
16	DD14	36	DA2
17	DD0	37	CS1FX
18	DD15	38	CS3FX
19	GND	39	DASP
20	(KEY)	40	GND

appendix B

POWER CORD SET REQUIREMENTS

The voltage select switch feature on the computer permits it to operate from any line voltage between 100-120 or 200-240 volts AC.

The power cord set received with the computer meets the requirements for use in the country where you purchased the equipment.

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 authorized Compaq 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

Power Cord Set Requirements–By Country		
Country	**Accrediting Agency**	**Applicable Note Numbers**
Australia	EANSW	1
Austria	OVE	1
Belgium	CEBC	1
Canada	CSA	2
Denmark	DEMKO	1
Finland	SETI	1
France	UTE	1
Germany	VDE	1
Italy	IMQ	1
Japan	JIS	3
Norway	NEMKO	1
Sweden	SEMKO	1
Switzerland	SEV	1
United Kingdom	BSI	1
United States	UL	2

✎ The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 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 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. The flexible cord must be Type VCT or VCTF, 3-conductor, 0.75 mm^2 conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

appendix *C*

HARD DRIVES

Compaq Computer Corporation uses IDE/EIDE hard disk drives that conform to two different primary/secondary implementations. These are Conner mode and ATA-compatible mode. These two modes are incompatible with one another.

Device 0/Device 1 Relationship

A device 0/device 1 relationship exists when there are two hard drives connected to a single port. In this situation, one drive must be designated as the device 0 (primary) drive and the other as the device 1 (secondary) drive. This designation is necessary because both drives cannot work simultaneously.

Cable Select

The Compaq Deskpro 2000 Series of Personal Computers use cable-select technology for identifying Device 0 (primary) and Device 1 (secondary) IDE/EIDE hard drives. Check that the jumpers on the IDE/EIDE hard drives are set properly for cable-select installation. Always check the label on the drives or check Chapter 7 of this manual when a new drive is added to verify that the jumper settings are set correctly.

■ Cable select may not function properly if drives other than those supported by Compaq are installed.

■ The second drive on a cable-select cable can be a CD-ROM drive. However, the CD-ROM drive must be installed in the device 1 position if a hard drive is installed on the same cable. Ensure that both drives are set for cable-select configuration. See Chapter 7 for more information.

■ If two drives are already connected to the primary IDE/EIDE controller and an additional drive is to be installed, the secondary IDE/EIDE controller must be enabled. The secondary IDE/EIDE controller can be enabled by checking this option after opening the Advanced box in the Mass Storage group of F10 Computer Setup. See Chapter 2 for more information.

■ When more than two drives are installed, drive performances are best when the two faster drives are connected to the primary IDE/EIDE controller and the slower drive is connected to the secondary IDE/EIDE controller.

■ A hard drive is installed and configured more quickly when the jumpers have been configured first.

■ If the new drive includes the cable-select feature, no jumper setting changes are required. Refer to the documentation supplied with the drive for instructions on using the cable select feature. If you install a third-party hard drive, you will need to purchase a jumper cable (spare part number 247568-001) from Compaq Computer Corporation.

SMART

The hard drives for the Compaq Deskpro 2000 Series of Personal Computers are all SMART compatible. Drives that are SMART compatible have built-in drive failure prediction that warns the user or the network administrator of an impending failure or crash of the hard drive.

Automatic Soft-Drive Types

An automatic soft-drive type is a mechanism where the system ROM and Computer Setup provide support for IDE/EIDE hard drives that are not supported in the hard drive parameter table. Computer Setup automatically builds a soft-drive type when it finds that a hard drive is not in the hard drive parameter table.

The soft-drive types assign according to the table below:

Table C-1
Soft-Drive Type Assignments

Drive	Hard Drive Type	Controller
0	65	Primary
1	66	Primary
0	68	Secondary
1	69	Secondary

For hard drives that are greater than 528 MB, the system automatically translates the hard drive parameter for DOS by logically halving the cylinders and doubling the heads. This allows DOS to access greater than 528 MB. The translated hard drive parameters are put into the hard drive parameter table in the shadow RAM copy of the system ROM. When using any operating system other than DOS, you must use the Compaq User Setup diskette to set up the hard drive parameter table without translation.

Ultra ATA (Pentium II System only)

Ultra ATA is also referred to as ultra direct memory access (UDMA) and ATA33. This new protocol doubles the transfer speed available with IDE/EIDE drives, from 16.7 MB/s to 33 MB/s. The increase in transfer rates allows the hard drive to keep pace with other hardware improvements.

A significant new feature implemented by Ultra ATA is cyclical redundancy check (CRC). CRC provides data protection verification that works at the higher speeds. This feature provides even greater integrity at speeds less than the maximum transfer speed of 33 MB/s.

The Ultra ATA protocol is fully backward compatible with older ATA modes. The protocol allows drives that support Ultra ATA to also support IDE/EIDE. These drives can be used with existing host chipsets.

The Ultra ATA drives are SMART II compatible. This compatibility allows the drives to fall under Compaq's Prefailure Warranty.

In order to take full advantage of the higher transfer rates, the standard 40-conductor cable must be replaced with an optional 80-conductor cable. The Compaq Deskpro 2000 Series of Personal Computers will support up to four mass storage devices. The following table shows the transfer rates available with the various combinations of devices in combination with the 40-conductor cable and with the 80-conductor cable:

Table C-2
IDE Cable Transfer Rates

Number of Drives		40-Conductor IDE Cable, Length*		80-Conductor IDE Cable**, Length > 14"	
Primary	Secondary	Primary Controller Mode/Speed	Secondary Controller Mode/Speed	Primary Controller Mode/Speed	Secondary Controller Mode/Speed
1	0	2 / 33 MB/s	— / —	2 / 33 MB/s	— / —
2	0	1 / 25 MB/s	— / —	2 / 33 MB/s	— / —
1	1	2 / 33 MB/s	2 / 33 MB/s	2 / 33 MB/s	2 / 33 MB/s
2	1	1 / 25 MB/s	2 / 33 MB/s	2 / 33 MB/s	2 / 33 MB/s
1	2	2 / 33 MB/s	1 / 25 MB/s	2 / 33 MB/s	2 / 33 MB/s
2	2	1 / 25 MB/s	1 / 25 MB/s	2 / 33 MB/s	2 / 33 MB/s

*With 1 drive ≤ 14"; with 2 drives ≤ 18".
**Ground-signal-ground (GSG) architecture cable.

appendix D

SCSI GUIDELINES

This appendix contains helpful guidelines for installing Small Computer System Interface (SCSI) devices. For more detailed information, refer to the documentation that came with your computer.

Guidelines for Installing Optional SCSI Devices

When installing and operating SCSI devices, you must adhere to the following guidelines:

■ **A single SCSI controller allows you to daisy-chain up to seven SCSI devices.** These may be hard drives, CD-ROM drives, scanners, tape drives, and/or other SCSI devices installed in your computer. Most SCSI controllers have connectors for both internal and external devices.

■ **Every SCSI device must have a unique identification (ID) number.** The SCSI controller identifies signals to and from a SCSI device by its SCSI ID number rather than its location. Moving a SCSI device from one position to another on the SCSI chain does not affect the communication between the controller and the SCSI device. Check the information that came with your device for the recommended SCSI ID number to be applied. The reserved and available SCSI ID numbers for Compaq computers are as follows:

  ❏ 0 is reserved for the primary hard drive and has the lowest device priority.
  ❏ 1 through 6 are available for use by all SCSI devices.
  ❏ 7 is reserved for the system board and has the highest device priority.

■ **Every SCSI chain or circuit must be terminated (closed) at both ends.** Termination can be accomplished in one of several ways:

  ❏ Use a cable with a built-in terminator.
  ❏ Use a cable with a terminating resistor plug in the last connector.
  ❏ Connect a SCSI device, with the termination enabled, into the last connector.

  Some systems have both ends of the SCSI cable connected to, and terminated by, the system board.

■ **Turn on all external SCSI devices before turning on power to the computer.** This enables the controller to recognize the external SCSI devices and automatically reset. When an external SCSI device is connected to the external SCSI connector on the rear panel of the computer, that device becomes the end of the SCSI chain and must be terminated.

■ **All SCSI hard drives must be either internal or external, but never both.** The system does accommodate a combination of other internal and external SCSI devices, such as SCSI tape and CD-ROM drives.

Termination

1. Every SCSI chain must be terminated at both ends regardless of whether it is an internal SCSI chain, an external SCSI chain, or a combination internal-external SCSI chain.

2. The PD-CD drive must be terminated by using a SCSI interconnect cable that has a terminating plug on one of its ends. This drive does not ship with terminating resistors.

3. Compaq SCSI-2 controllers have an automatic terminating device which turns OFF the terminator when both the external and internal SCSI signal ports connect to SCSI devices.

4. A terminating resistor plug is molded into one end of some internal flat SCSI signal cables. It may also be a separate electronic device that installs into the SCSI signal port of an external device, installs into an internal flat SCSI signal cable connector, or installs into the SCSI signal port of some non-Compaq SCSI-2 controllers.

5. Terminators are generally designated as being active or passive by the voltage limiting method used. Both types of terminators come in the forms described in 2, 3, and 4 above. The product documentation usually describes the terminator type.

6. All Compaq SCSI-2 controllers have active terminators. Active terminators more effectively filter out electronic noise (voltage surges) on the SCSI chain than passive terminators.

7. To ensure the integrity of data transferred faster than 5 megabytes per second, use active terminators to terminate the SCSI chain.

appendix E

DIAGNOSTIC ERROR CODES

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

Table E-1 lists the device codes (<u>AA</u>BB-CC) and the subtest range (AA<u>BB</u>-CC) covered by Compaq Diagnostics Tests. Some codes will not apply to the computers described in this manual and will not be detailed in the tables that follow.

Table E-1
Summary of Test Error Codes

Error Code Range	Device Description	Error Code Range	Device Description
0100 - 0199	Processor (P1)	3113 - 3199	Third Processor (P3)
0200 - 0215	Memory	3206	Audio System
0301 - 0304	Keyboard	3300 - 3333	Multimedia
0401 - 0498	Parallel Port	3400 - 3401	TV Tuner Board
0501 - 0516	Video Display Unit	4113 - 4199	Fourth Processor
0600 - 0699	Diskette Drive	5100 - 5130	Plasma Display System
0802 - 0824	Monochrome Video Board	5234 - 5240	Advanced Color Graphics (AGC)
1101 - 1109	Serial Port	6000 - 6089	Network Card
1201 - 1210	Modem	6500 - 6599	SCSI Hard Drives
1700 - 1799	Hard Drive	6600 - 6699	SCSI CD-ROM Drives
1900 - 1906	Tape Drive	6700 - 6799	SCSI Tape Drives
2113 - 2199	Second Processor (P2)	7000	Server Manager/R Board
2402 - 2480	Enhanced Color Graphics (ECG/VGA)	8601 - 8602	Auxiliary Input Interface
2502 - 2502	Pen/Digitizer	8700 - 8702	Game Port

Tables E-2 through E-18 list possible error codes, descriptions of each error condition, and actions required to resolve the error condition.

✎ 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 Chapters 5 and 6, "Removal and Replacement Procedures."

Table E-2
Microprocessor Test Error Codes

Error Code	Description	Recommended Action
0101-xx	CPU test failed.	Replace the system board and retest.
0102-xx	Coprocessor error.	1. Run Computer Checkup or Computer Setup and retest.
		2. Replace the system board and retest.
0103-xx	DMA controller failed.	The following step applies to error codes 0103-xx through 0106-xx:
0104-xx	Interrupt controller failed.	Replace the system board and retest.
0105.xxx	Port error.	
0106-xx	Keyboard controller self-test failed.	
0107-xx	CMOS RAM test failed.	The following steps apply to error codes 0107-xx through 0109-xx:
0108-xx	CMOS interrupt test failed.	1. Replace the battery/clock module and retest.
0109-xx	CMOS clock test failed.	2. Replace the system board and retest.
0110-xx	Programmable timer test failed.	The following step applies to error codes 0110-xx through 0113-01:
0113-01	Protected mode test failed.	Replace the system board and retest.
0114-01	Speaker test failed.	1. Verify the speaker connection.
		2. Replace the system board and retest.

Table E-3
Memory Test Error Codes

Error Code	Description	Recommended Action
0200-xx	Memory machine ID test failed.	Reinsert memory modules and retest.
0202-xx	Memory system ROM checksum failed.	The following steps apply to error codes 0202-xx through 0211-xx:
0203-xx	Memory write/read test failed.	1. Remove one memory module at a time until the error message stops.
0204-xx	Memory address test failed.	2. Replace other removed modules one at a time, testing each to ensure the error does not return.
0205-xx	Memory walking 1s test failed.	3. Replace the system board and retest.
0209-xx	RAM long test failed.	
0211-xx	Random pattern test failed.	
0212-xx	Cache test failed.	1. Replace cache module. 2. Replace system board and retest.
0213-xx	Incompatible DIMM error in DIMM socket(s) x, x, ….*	Replace with a compatible DIMM (see Appendix H).
0214-xx	Noise test failed.	The following steps apply to error codes 0214-xx through 0215-xx:
0215-xx	Random address test failed.	1. Remove one memory module at a time until the error message stops.
		2. Replace other removed modules one at a time, testing each to ensure the error does not return.
		3. Replace memory module that produces error.
		4. Replace the system board and retest.

*x,x,… is a list of memory modules affected by the error.

Table E-4
Keyboard Test Error Codes

Error Code	Description	Recommended Action
0300-xx	Keyboard ID test failed.	The following steps apply to error codes 0300-xx through 0304-xx:
0301-xx	Keyboard self-test/interface test failed.	1. Check the keyboard connection. If disconnected, turn the computer off and connect the keyboard.
0302-xx	Individual key test failed.	2. Replace the keyboard and retest.
0304-xx	Keyboard repeat test failed.	3. Replace the system board and retest.

Table E-5
Parallel Printer Test Error Codes

Error Code	Description	Recommended Action
0401-xx	Printer failed or not connected.	The following steps apply to 0401-xx through 0403-xx:
0402-xx	Printer port test failed.	1. Connect the printer.
0403-xx	Printer pattern test failed.	2. Check power to the printer.
		3. Install the loop-back connector and retest.
		4. Replace system board and retest.

Table E-6
Diskette Drive Test Error Codes

Error Code	Description	Recommended Action
0600-xx	Diskette ID drive types test failed.	The following steps apply to error codes 0600-xx through 0610-xx:
0601-xx	Diskette format failed.	1. Replace the diskette media and retest.
0602-xx	Diskette read test failed.	2. Check and/or replace the diskette power and signal cables and retest.
0603-xx	Diskette write, read, compare test failed.	3. Replace the diskette drive and retest.
0604-xx	Diskette random seek test failed.	4. Replace the system board and retest.
0605-xx	Diskette ID media test failed.	
0606-xx	Diskette speed test failed.	
0610-xx	Diskette change line test failed.	

Table E-7
Serial Test Error Codes

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	1. Run Computer Setup or Windows NT or Windows 95 utilities.
		2. Replace the system board and retest.

Table E-8
Modem Communications Test Error Codes

Error Code	Description	Recommended Action
1201-xx	Modem internal test failed.	The following steps apply to error codes 1201-xx through 1210-xx:
1203-xx	Modem external termination test failed.	1. Disconnect from the phone line and retest.
1204-xx	Modem auto originate test failed.	2. Check the phone number.
1205-xx	Modem auto answer test failed.	3. Check the modem line.
1210-xx	Modem direct connect test failed.	4. Replace the modem and retest.

Table E-9
Hard Drive Test Error Codes

Error Code	Description	Recommended Action
1701-xx	Hard drive format test failed.	The following steps apply to error codes 1701-xx through 1736-xx:
1702-xx	Hard drive read test failed.	1. Run Computer Setup and verify drive type.
1703-xx	Hard drive write/read/compare test failed.	2. Replace the hard drive signal and power cables and retest.
1704-xx	Hard drive random seek test failed.	3. Replace the hard drive and retest.
1705-xx	Hard drive controller test failed.	4. Replace the system board and retest.
1708-xx	Hard drive format bad track test failed.	
1710-xx	Hard drive park head test failed.	
1715-xx	Hard drive head select test failed.	
1716-xx	Hard drive conditional format test failed.	
1717-xx	Hard drive ECC* test failed.	
1719-xx	Hard drive power mode test failed.	
1724-xx	Hard drive network preparation test failed.	
1736-xx	Hard drive monitoring test failed.	

*Error Correction Code.

Table E-10
Tape Drive Test Error Codes

Error Code	Description	Recommended Action
1900-xx	Tape drive ID test failed.	The following steps apply to error codes 1900-xx through 1910-xx:
1901-xx	Tape drive servo test failed.	1. Replace the tape cartridge and retest.
1902-xx	Tape drive format or format verification test 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 drive BOT/EOT test failed.	4. Replace the tape adapter board (if applicable) and retest.
1905-xx	Tape drive read test failed.	5. Replace the tape drive and retest.
1906-xx	Tape drive write/read/compare failed.	6. Replace the system board and retest.
1910-xx	Tape erase test failed.	

Table E-11
Video Test Error Codes

Error Code	Description	Recommended Action
2401-xx	Graphics controller test failed.	1. Replace the video board and retest.
		2. Replace the system board and retest.
2402-xx	Video memory test failed.	The following steps apply to error codes 2402-xx through 2418-xx:
2403-xx	Video attribute test failed.	1. Run Compaq Utilities.
2404-xx	Video character set test failed.	2. Replace the monitor and retest.
2405-xx	Video 80 × 25 mode 9 × 14 character cell test failed.	3. Replace the video board and retest.
		4. If no video board is present or if video is integrated, replace system board and retest.
2406-xx	Video 80 × 25 mode 8 × 8 character cell test failed.	
2408-xx	Video 320 × 200 mode color set 0 test failed.	
2409-xx	Video 320 × 200 mode color set 1 test failed.	
2410-xx	Video 640 × 200 mode test failed.	
2411-xx	Video screen memory page test failed.	
2412-xx	Video gray scale test failed.	
2418-xx	ECG/VGC memory test failed.	
2419-xx	ECG/VGC ROM checksum test failed.	1. Run Compaq Utilities.
		2. Replace the monitor and retest.
		3. Replace the video board and retest.
		4. If no video board is present or if video is integrated, replace system board and retest.
2420-xx	Graphics attribute test failed.	1. Replace the monitor and retest.
		2. Replace the video board and retest.
		3. Replace the system board and retest.
2421-xx	ECG/VGC 640 × 200 graphics mode test failed.	The following steps apply to error codes 2421-xx through 2456-xx:
2422-xx	ECG/VGC 640 × 350 16 color set test failed.	1. Run Compaq Utilities.
2423-xx	ECG/VGC 640 × 350 64 color set test failed.	2. Replace the monitor and retest.
2424-xx	ECG/VGC monochrome text mode test failed.	3. Replace the video board and retest.
2425-xx	ECG/VGC monochrome graphics mode test failed.	4. If no video board is present or if video is integrated, replace system board and retest.
2431-xx	640 × 480 graphics test failure.	
2432-xx	320 × 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.	

Continued

Table E-11 *Continued*

Error Code	Description	Recommended Action
2458-xx	Advanced VGA BitBLT test.	The following steps apply to error codes 2458-xx through 2480-xx:
2468-xx	Advanced VGA DAC test.	1. Replace the video board and retest.
2477-xx	Advanced VGA data path test.	2. Replace the system board and retest.
2478-xx	Advanced VGA BitBLT test.	
2480-xx	Advanced VGA Linedraw test.	

Table E-12
Audio Test Error Codes

Error Code	Description	Recommended Action
3206-xx	Audio System Internal Error.	Replace the system board and retest.

When Windows 95 is installed, changes to ESS sound device configuration do not take effect until the computer is restarted (turned off and on).

Table E-13
Network Interface Test Error Codes

Error Code	Description	Recommended Action
6000-xx	Network ID test failed.	The following steps apply to error codes 6000-xx through 6089-xx:
6014-xx	Network configuration test failed.*	1. Run Computer Setup or Windows NT or Windows 95 utilities.
6016-xx	Network reset test failed.*	2. Verify test procedures.
6028-xx	Network internal test failed.*	3. Replace the network board, if installed.
6029-xx	Network external test failed.	4. Replace the system board.
6054-xx	Network configuration test failed.**	
6056-xx	Network reset test failed.**	
6068-xx	Network internal test failed.**	
6069-xx	Network external test failed.**	
6089-xx	Network open test failed.**	

*Ethernet only.
**Token Ring only.

Table E-14
SCSI CD-ROM Test Error Codes

Error Code	Description	Recommended Action
6600-xx	ID test failed.	The following steps apply to error codes error codes 6600-xx through 6623-xx:
6605-xx	Read test failed.	1. Replace the CD media and retest.
6608-xx	Controller test failed.	2. Check the jumper settings on the adapter board.
6623-xx	Random read test failed.	3. Verify that the speakers are connected.
		4. Check and/or replace the power and signal cables and retest.
		5. Replace the CD-ROM drive and retest.

Table E-15
Pointing Device Test Error Codes

Error Code	Description	Recommended Action
8601-xx	Mouse test failed.	The following steps apply to error codes 8601-xx through 8602-xx:
		1. Replace with a working mouse and retest.
8602-xx	Interface test failed.	2. Replace the system board and retest.

SCSI Error Codes

This section includes the error codes for the following SCSI devices:

■ Hard drives

■ CD-ROM drives

■ Tape drives

■ PD-CD drives

The SCSI error codes are written in the format AABB-CC and can be determined by looking up the respective parts of the code in the three corresponding tables numbered D-16, D-17, and D-18. AA (Table E-16) identifies the drive type being tested. BB (Table E-17) identifies the type of test. CC (Table E-18) identifies the exact error received.

For example, if you received a diagnostic error code of 6523-05, you would look at Table E-16 to identify the meaning of the first two numbers, 65. This indicates a hard drive problem. The second set of two numbers, 23, refers to a random read, as shown in Table E-17. The last two numbers, 05, indicate a seek failure, as listed in Table E-18. When you combine this information, you know that the diagnostics program was testing the random-read functioning of the hard drive and received a seek failure. The device is faulty and must be replaced.

Table E-16 SCSI Device Names	
65XX-XX	Hard drive
66XX-XX	CD-ROM Drive and PD-CD drive
67XX-XX	Tape drive

Table E-17 SCSI Test Names	
XX00-XX	ID
XX05-XX	Read
XX06-XX	SA/Media
XX08-XX	Controller
XX09-XX	Media erase
XX23-XX	Random read
XX28-XX	Media load/unload

Table E-18
SCSI Test Error Codes

Error Code	Description	Recommended Action
XXXX-02	Drive not installed.	Check cable connections.
XXXX-03	Media not in drive.	Check for and install DATA CD or write-enabled tape in drive.
XXXX-05	Seek failure.	Replace the indicated device.
XXXX-06	Drive timed out.	Replace the indicated device.
XXXX-07	Drive busy.	Replace the indicated device.
XXXX-08	Drive already reserved.	Replace the indicated device.
XXXX-09	Unknown.	
XXXX-10	Unknown.	
XXXX-11	Media soft error.	Replace the indicated device.
XXXX-12	Drive not ready.	Replace the indicated device.
XXXX-13	Media error.	Replace the indicated device.
XXXX-14	Drive hardware error.	Replace the indicated device.
XXXX-15	Illegal drive command.	Replace the indicated device.
XXXX-16	Media was changed.	Replace the indicated device.
XXXX-17	Tape write-protected.	1. Disable write-protect on tape cartridge. 2. Replace tape drive.
XXXX-18	No data detected.	Replace the indicated device.
XXXX-21	Drive command aborted.	Replace the indicated device.
65XX-24	Media hard error.	1. Back up data and perform Surface Analysis to reallocate defect. 2. Replace drive.
66XX-24	Media hard error.	1. Replace current DATA CD with different DATA CD. 2. Replace drive.
67XX-24	Media hard error.	1. Ensure correct media type for this tape drive. 2. Replace current tape with new tape. 3. Replace tape drive.
XXXX-25	Unknown.	
XXXX-30	Controller timed out.	Replace the indicated device.
XXXX-31	Unrecoverable error.	Replace the indicated device.
XXXX-32	Controller/drive disconnected.	Replace the indicated device.
XXXX-33	Illegal controller command.	Replace the indicated device.
XXXX-34	Invalid SCSI bus phase.	Replace the indicated device.
XXXX-35	Invalid SCSI bus phase.	Replace the indicated device.
XXXX-36	Invalid SCSI bus phase.	Replace the indicated device.
XXXX-39	Error status from drive.	Replace the indicated device.
XXXX-40	Target timed out.	Replace the indicated device.

Continued

Table E-18 *Continued*

Error Code	Description	Recommended Action
XXXX-41	SCSI bus stayed busy.	Replace the indicated device.
XXXX-42	ACK/REQ lines bad.	Replace the indicated device.
XXXX-43	ACK did not deassert.	Replace the indicated device.
XXXX-44	Parity error.	Replace the indicated device.
XXXX-50	Data pins bad.	Replace the indicated device.
XXXX-51	Data line 7 bad.	Replace the indicated device.
XXXX-52	MSG, C/D, and/or I/O lines bad.	Replace the indicated device.
XXXX-53	BSY never went busy.	Replace the indicated device.
XXXX-54	BSY stayed busy.	Replace the indicated device.
XXXX-60	Controller CONFIG-1 register bad.	Replace the indicated device.
XXXX-61	Controller CONFIG-2 register bad.	Replace the indicated device.
XXXX-65	Media not unloaded.	Replace the indicated device.
XXXX-90	Fan failure.	1. Ensure fan(s) connected. 2. Replace nonfunctional fan(s).
XXXX-91	Over temperature.	1. Ensure proper air flow. 2. Perform required maintenance and cleaning.
XXXX-99	Autoloader reported tapes not loaded properly.	1. Install tape(s) in autoloader tape drive according to test instructions. 2. Change autoloader magazine.

appendix *F*

POST ERROR MESSAGES

An error message results if the Power-On Self-Test encounters a problem. This test runs when the system is turned on, checking assemblies within the computer and reporting any errors found.

Table F-1
Power-On Self-Test Messages

Message	Beeps*	Probable Cause	Recommended Action
101-ROM Error	1L, 1S	System ROM checksum.	1. Reflash the ROM using Boot Block. 2. Replace the system board.
101-Option ROM Checksum Error	1L, 1S	Option ROM checksum.	Replace the system board.
162-System Options Not Set	2S	Configuration incorrect.	Run Computer Setup or Windows NT or Windows 95 utilities.
163-Time & Date Not Set	2S	Invalid time or date in configuration memory.	Set the date and time under Control Panel.
164-Memory Size Error	2S	Memory configuration incorrect.	Run Computer Setup or Windows NT or Windows 95 utilities.
201-Memory Error	None	RAM failure.	1. Run Computer Setup or Windows NT or Windows 95 utilities. 2. Replace the memory module(s) (if any). 3. Replace system board.
203-Memory Address Error	None	RAM failure.	1. Run Computer Setup or Windows NT or Windows 95 utilities. 2. Replace the memory module(s) (if any). 3. Replace system board.
205-Memory Error	None	Cache memory error (processor cache).	Run Compaq Utilities.
206-Secondary cache controller failure	None	Cache memory controller or RAM failure.	Run Compaq Utilities.
207-ECC corrected single bit error in DIMM/SIMM pair(s) x, x, …**	2S	Single bit ECC error.	Replace DIMM if error persists.
213-Incompatible DIMM error in DIMM socket(s) x, x, …**	2S	Incompatible DIMM installed.	Replace with a compatible DIMM (see Appendix H).
301-Keyboard Error	None	Keyboard failure.	Reconnect keyboard with computer turned off.

* L = Long, S = Short.
** x, x, … is a list of memory modules affected by the error

Continued

Table F-1 *Continued*

Message	Beeps*	Probable Cause	Recommended Action
301-Keyboard Error or Test Fixture Installed	None	Keyboard failure.	Replace the keyboard.
303-Keyboard Controller Error	None	I/O board keyboard controller.	1. Reconnect keyboard with computer turned off. 2. Replace the system board.
304-Keyboard or System Unit Error	None	Keyboard failure.	1. Replace the keyboard. 2. Replace the system board.
402-Monochrome Adapter Failure	1L, 2S	Monochrome display controller.	Replace the monochrome display controller.
404-Parallel Port Address Conflict Detected	2S	Both external and internal ports are assigned to parallel port X.	Run Computer Setup or Windows NT or Windows 95 utilities.
501-Display Adapter Failure	1L, 2S	Video display controller.	Replace the graphics board.
601-Diskette Controller Error	None	Diskette controller circuitry or floppy drive circuitry incorrect.	1. Run Setup. 2. Check and/or replace cables. 3. Replace diskette drive. 4. Replace the system board.
602-Diskette Boot Record Error	None	Diskette in drive A not bootable.	Replace the diskette.
605-Diskette Drive Type Error	2S	Mismatch in drive type.	Run Computer Setup or Windows NT or Windows 95 utilities.
610-External Storage Drive Failure	None	External tape drive not connected.	Reinstall tape drive or press F1 and allow system to reconfigure without the drive.
611-Primary Floppy Port Address Assignment Conflict	2S	Configuration error.	Run Computer Setup or Windows NT or Windows 95 utilities.
612-Secondary Floppy Port Address Assignment Conflict	2S	Configuration error.	Run Computer Setup or Windows NT or Windows 95 utilities.
912-The Computer Cover Has Been Removed Since Last System Startup	None		No action required.
1151-System Board Comm Port 1 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM1.	Run Computer Setup or Windows NT or Windows 95 utilities.
1152-System Board Comm Port 2 Address Assignment Conflict	2S	Both external and internal serial ports are assigned to COM2.	Run Computer Setup or Windows NT or Windows 95 utilities.
1155-System Board COMM Port Address Assignment Conflict	2S	Both external and internal serial ports are assigned to the same COMM port.	Run Computer Setup or Windows NT or Windows 95 utilities.

* L = Long, S = Short

Continued

Table F-1 *Continued*

Message	Beeps*	Probable Cause	Recommended Action
1720-SMART Hard Drive detects imminent failure	None	Hard drive is about to fail.	Back up contents and replace hard drive.
1721-SMART SCSI Hard Drive detects imminent failure	None	Hard drive is about to fail.	Back up contents and replace hard drive.
1771-Primary Disk Port Address Assignment Conflict	2S	Internal and external hard drive controllers are both assigned to the primary address.	Run Computer Setup or Windows NT or Windows 95 utilities.
1772-Secondary Disk Port Address Assignment Conflict	2S	Internal and external hard drive controllers are both assigned to the secondary address.	Run Computer Setup or Windows NT or Windows 95 utilities.
1780-Disk 0 Failure	None	Hard drive/format error.	1. Run Compaq Utilities. 2. Replace hard drive.
1781-Disk 1 Failure	None	Hard drive/format error.	1. Run Compaq Utilities. 2. Replace hard drive.
1782-Disk Controller Failure	None	Hard drive circuitry error.	1. Run Compaq Utilities. 2. Replace hard drive.
1790-Disk 0 Failure	None	Hard drive error or wrong drive type.	1. Run Compaq Utilities. 2. Replace hard drive.
1791-Disk 1 Failure	None	Hard drive error or wrong drive type.	1. Run Compaq Utilities. 2. Replace hard drive.
1792-Secondary Disk Controller Failure	None	Hard drive circuitry error.	1. Run Compaq Utilities. 2. Replace hard drive.
1793-Secondary Controller or Disk Failure	None	Hard drive circuitry error.	1. Run Compaq Utilities. 2. Replace hard drive.
1800-Temperature Alert	None	Internal temperature exceeds specification.	Check that computer air vents are not blocked and cooling fan is running.
Invalid Electronic Serial Number	None	Electronic serial number has become corrupted.	Run Computer Setup.
Failsafe Boot Block	1L,3S	An invalid system ROM has been detected.	1. Replace the invalid ROM**. 2. Run ROMPaq

* L = Long, S = Short
** See Section 5.9.1 for the desktop and Section6.12.1 for the minitower.

appendix G

TROUBLESHOOTING WITHOUT DIAGNOSTICS

This section describes some simple, preliminary tests and guidelines for troubleshooting the computer without using the diagnostics.

Checklist for Solving Minor Problems

If you encounter some minor problem with the computer or a software application, go through the following 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?

■   Is the monitor turned on and the power light illuminated?

■   If the monitor is dim, turn up the brightness and contrast controls of the monitor.

■   Press and hold any key. If the system beeps, then the keyboard should be operating correctly.

■   Are all of the necessary device drivers installed?

■   Have all printer drivers been installed for each application?

■   Was a nonbootable diskette loaded in the diskette drive at startup?

■   Was a bootable compact disc in the CD-ROM drive at startup?

■   Are all switch settings correct?

■   Have all jumper settings been set as instructed by the configuration utility?

■   Was Computer Setup run after non–Plug and Play options?

Power Problems

This section identifies some quick checks for power–related problems.

Table G-1
Solutions for Power Problems

Problem	Possible Solution
Computer will not turn on.	Ensure that the computer is connected to a power source.
	Cables to the external power source are unplugged. Ensure that cables connecting the computer and the external source are plugged in properly.
	A PCI or ISA card that has been installed is defective. Remove any adapter card that was just installed.
Computer does not automatically display the date and time.	The real-time clock (RTC) battery may need to be replaced. See Chapters 5 and 6 for replacement procedures.

Thermal Problems

This section identifies a thermal problem that could be related to the processor overheating.

Table G-2
Solutions for Thermal Problems

Problem	Possible Solution
Computer screen frozen, the power supply fan continues to run, and the power LED is illuminated.	1. Turn off the computer and let everything cool down.
	2. Check to ensure that the air duct is installed and the processor is under the flap (Pentium II minitower system only).
	3. Check for 3 inches of clearance at the front and back of the computer.
	4. Resume operation.
	5. If lock-up continues, run diagnostics for total system.
	6. Look for software or interrupt conflicts.
	7. Replace the processor, if necessary. See Chapters 5 and 6 for replacement procedures.

Diskette Drive Problems

This section identifies some quick checks for diskette drive problems.

Table G-3
Solutions for Diskette Drive Problems

Problem	Possible Solution
Diskette drive light stays on.	1. Diskette might be damaged. In Windows NT, run Disk Administrator. At the Start menu, highlight Programs and select Administrator Tools. In Windows 95, run ScanDisk. At the Start menu, highlight Programs, select Accessories, then select System Tools.
	2. Diskette could be installed incorrectly. Remove the diskette and reinsert.
	3. Software program may be damaged. Check the program diskettes.
	4. Drive button is not pushed in. Push in drive button.
	5. Drive cable is not properly connected. Reconnect drive cable.
Diskette drive cannot write to a diskette.	1. Diskette is not formatted. Format the diskette.
	2. Diskette is write-protected. Either use another diskette that is not write-protected or disable the write protection on the diskette.
	3. Writing to the wrong drive. Check the drive letter in the path statement.
	4. Not enough space is left on the diskette. Use another diskette to write the information.
	5. Diskette write control is disabled. Check the security feature settings.
Diskette drive cannot read a diskette.	1. Diskette is not formatted. Format the diskette.
	2. Using the wrong diskette type for the drive type. Use a diskette that is compatible with the drive.
	3. Reading the wrong drive. Check the drive letter in the path statement.
	4. Diskette drive has been disabled by Computer Setup, Windows NT, or Windows 95 utilities. Run Computer Setup and enable the diskette drive.
A problem has occurred with a disk transaction.	The directory structure is bad, or there is a problem with a file. In Windows NT, run Disk Administrator. At the Start menu, highlight Programs and select Administrator Tools. In Windows 95, run Scan Disk. At the Start menu, highlight Programs, select Accessories, then select System Tools.
Non-system disk message.	Remove the diskette from the drive.
Drive not found.	1. Check the cables for loose connections.
	2. Was Computer Setup run after installing 2nd diskette drive?

Display Problems

This section identifies some quick checks for display–related problems.

Table G-4
Solutions for Display Problems

Problem	Possible Solution
Screen is blank.	1. Monitor is not turned on and the monitor light is not on. Turn on the monitor and check that the monitor light is on.
	2. Screen save has been initiated. Press any key or move the mouse to light the screen.
	3. Check the cable connection from the monitor to the computer and check the electrical outlet.
	4. The brightness need adjusting. Adjust the brightness control.
	5. The QuickBlank feature has been enabled through Security Management. Run Computer Setup and disable the QuickBlank feature.
	6. The energy saver feature has been enabled. Hit any key or type the password.
	7. The RGB (Red, Green, Blue) input switch on the back of the monitor is incorrectly set. Set the monitor's input switch to 75 ohms and, if there is a sync switch, set it to External.
	8. If a fixed-sync monitor is used, be sure that the monitor can accept the same sweep rate as the resolution chosen.
Graphics colors are wrong.	1. Ensure that the Red, Green, and Blue BNC cables are connected to the corresponding monitor connectors.
	2. Be sure the monitor's RGB inputs are set to 75 ohms.
Characters are dim.	1. Adjust the monitor's brightness and contrast controls.
	2. Check that the video cable is securely connected to the graphics card and monitor.
	3. Set the RGB switch (and sync options, if available) to 75 ohms, with the sync set to External. Refer to the documentation included with the monitor.
Monitor does not function properly when used with the energy saver features.	Monitor without the energy saver feature is being used with energy saver features enabled. Disable the monitor energy saver feature.
Blurry display or requested resolution cannot be set.	If the graphics controller was upgraded, the correct display drivers may not be loaded. Install the correct display drivers from the diskette included in the upgrade kit.
The picture is broken up; it rolls, jitters, or blinks.	1. Be sure the monitor cable is securely connected to the computer.
	2. In a 2-monitor system or if another monitor is in close proximity, be sure the monitors are not interfering with each other's magnetic field by moving them apart.
Screen goes blank.	A screen blanking utility may be installed or energy saver features are enabled. Press any key or type password.
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.
Garbled characters on the screen are mixed with text.	The ANSI.SYS driver is not in the *CONFIG.SYS* file. Add the ANSI.SYS driver to the *CONFIG.SYS* file by adding the following line:
	DEVICE = C:\CPQDOS\ANSI.SYS

Printer Problems

This section identifies some quick checks for printer–related problems.

Table G-5
Solutions for Printer Problems

Problem	Possible Solution
Printer will not print.	1. Printer is not turned on and online. Turn the printer on and make sure it is online.
	2. The correct printer drivers for the application are not installed. Install the correct printer drivers for the application.
	3. If the computer is on a network, you may not have made the connection to the printer. Make the proper network connections to the printer.
Printer will not turn on.	The cables may not be connected properly. Reconnect all cables and check the power cord and electrical outlet.
Prints garbled information.	1. The correct printer drivers for the application are not installed. Install the correct printer driver for the application.
	2. The cables may not be connected properly. Reconnect all cables.
Printer is offline.	The printer may be out of paper. Check the paper tray and refill it if it is empty. Select online.

Hard Drive Problems

This section identifies some quick checks for hard drive–related problems.

The information provided by the diagnostics test includes: error code, system serial number, drive serial number, drive model, and drive firmware revision. Specific details of the drive failure are not included.

When you run the diagnostics, the test results are stored in a log. After completing the test, you can print this log to a local printer or save it to a file. Alternatively, before running the test, you can configure the test options to send the results to a local printer or file.

Solutions for some typical hard drive problems are presented in Table G-5.

Table G-6
Solutions for Hard Drive Problems

Problem	Possible Solution
Hard drive error occurs.	Hard disk has bad sectors or has failed. Use a utility to locate and block usage of bad sectors. If necessary, reformat the hard disk.
Disk transaction problem.	Either the directory structure is bad or there is a problem with a file.
	In Windows NT, run Disk Administrator. At the Start menu, highlight Programs and select Administrator Tools. In Windows 95, run ScanDisk. At the Start menu, highlight Programs, select Accessories, then select System Tools.
Drive not found.	1. Cable could be loose. Check cable connections.
	2. The system may not have automatically recognized a newly installed device. If Windows NT is installed, run Computer Setup and identify the new device. If Windows 95 is installed, run Device Manager and identify the device.
	3. If the drive is a secondary drive that has just been installed on the same controller as the primary drive, verify that the jumpers for both drives are set correctly.
Nonsystem disk message.	1. The system is trying to start from a diskette that is not bootable. Remove the diskette from the diskette drive.
	2. 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.
	3. Diskette boot has been disabled in Computer Setup. Run Computer Setup and enable diskette boot.

Hardware Installation Problems

This section identifies some quick checks for hardware problems.

Table G-7
Solutions for Hardware Installation Problems

Problem	Possible Solutions
A new device is not recognized as part of the computer system.	1. The Computer Setup utility has not been run to configure the new device.* Run the Computer Setup utility.
	2. When the system advised you of changes to the configuration, you did not accept them. Reboot the computer and follow the instructions for accepting the changes.
	3. The system may not have automatically recognized the new device. If Windows NT is installed, run Computer Setup and identify the new device. If Windows 95 is installed, run Device Manager and identify the device.
	4. A Plug and Play board may not automatically configure when added if the default configuration conflicts with other devices. Use Computer Setup (Windows NT installed) or Device Manager (Windows 95 installed) to deselect the automatic settings for the board and choose a basic configuration that doesn't cause a resource conflict.
	5. The cables for the new external device are loose or the power cables are unplugged. Check all cables.
	6. The power switch for the new external device is not turned on. Turn off the computer, turn on the external device, and then turn the computer on to integrate the new device with the computer.
	7. If the drive is a secondary drive that has just been installed on the same controller as the primary drive, verify that the jumpers for both drives are set correctly.
The computer supports Plug and Play, but the hardware configuration settings in Computer Setup do not match the settings in Windows 95 Device Manager.	In Windows 95, onboard serial devices that are assigned to ports other than COM1 or COM2 have their configuration saved statically in CMOS. When the system is rebooted, the ROM configures the device to the static setting; when Windows 95 loads, it configures the device to the configuration set via Device Manager. In such cases, the configuration shown when F10 Setup is run does not match what was set up via Device Manager.
	If these devices must be configured a certain way before Windows 95 loads, then the serial port devices on the system should only be configured to COM1 or COM2 resources. If the system has two serial devices plus a modem, then the first serial device can be COM1 or COM2 or disabled, the modem can be COM1 or COM2 or disabled, and the second serial device can be COM4 or disabled.

*Computer Setup must be run after installing 2nd diskette drive.

CD-ROM Drive Problems

This section identifies some quick checks for CD-ROM drive–related problems.

Table G-8
CD-ROM Drive Problems

Problem	Possible Solution
Cannot read compact disc.	1. CD is not properly seated in the drive. Eject the CD, correctly seat it in the drive, then reload.
	2. CD has been loaded upside down. Eject the CD, turn it over, then reload.
System will not boot from CD-ROM drive.	1. The CD-ROM boot is not enabled through the Computer Setup utility. Run the Computer Setup utility and set the drive priorities.
	2. Ensure that drive cabling and jumpers are set correctly. To boot a SCSI drive, the drive ID number must be set to 0.
Cannot eject compact disc.	Turn off the computer and reboot. Push the eject button once the system has booted. If this fails, call an authorized service technician to remove the CD from the drive.
CD-ROM device is not detected; driver is not loaded.	CD-ROM drive is not connected properly. Open the computer and check to see that the drive cable is connected properly.

Memory Problems

This section identifies some quick checks for memory–related problems.

Table G-9
Memory Problems

Problem	Possible Solution
Out of Memory error.	1. In Windows NT, run Performance Monitor. At the Start menu, highlight Programs and select Administrator Tools. In Windows 95, run Resource Meter. At the Start menu, highlight Programs, select Accessories, then select System Tools.
	2. The computer has run out of memory to run the application. Check the application documentation to determine the memory requirements.
Memory count during POST is wrong.	The memory modules may not be installed correctly. Check that the memory modules have been installed correctly, then run the Configuration utility.
Insufficient memory error during operation.	1. Too many Terminate and Stay Resident programs (TSRs) are installed. Delete any unnecessary TSRs.
	2. The computer has run out of memory for the application. Check the memory requirements for the application or add more memory to the computer.

SCSI Problems

Some common causes and solutions for SCSI device problems are listed in the following table.

Table G-10
SCSI Problems

Problem	Cause	Solution
System with IDE/EIDE and SCSI drives will not boot from SCSI hard drive.	The IDE/EIDE drive is not disabled through the Configuration Utility.	Run the Configuration Utility and disable the primary IDE/EIDE drive.
System will not boot from a SCSI drive.	The SCSI drive is not configured correctly.	Ensure that drive cabling and jumpers are set correctly. To boot a SCSI drive, the drive ID number must be set to 0.

Network Problems

Some common causes and solutions for network problems are listed in the following table. These guidelines do not discuss the process of debugging network cabling.

Table G-11
Network Problems

Problem	Cause	Solution
System does not detect a network controller.	Possible I/O address conflict with another expansion board.	Factory default is 300h to 30Fh for Ethernet. Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller.
System Setup utility reports unprogrammed EPROM.	1. Possible I/O address conflict with another expansion board. 2. The network controller is defective. 3. Network drivers are not loaded.	1. Factory default is 300h to 30Fh for Ethernet. Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller. 2. Replace the controller or the system board. 3. Boot the computer without the network drivers, using a system boot diskette, and reconfigure the network controller.
Diagnostics reports a failure.	1. Possible I/O address conflict with another expansion board. 2. The cable is not securely connected. 3. The cable is attached to the incorrect connector. 4. There is a problem with the cable or a device at the other end of the cable. 5. The network controller is defective. 6. Network controller interrupt or memory overlaps the interrupt or memory of an expansion board.	1. Factory default is 300h to 30Fh for Ethernet. Either remove and reconfigure the conflicting expansion board, or reconfigure the network controller. If the address is changed, ensure that the drive parameters match the new I/O address for the network controller. 2. Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device. 3. Ensure that the cable is attached to the correct connector. 4. Ensure that the cable and device at the other end are operating correctly. 5. Replace the controller or the system board. 6. Run Computer Setup and modify the network controller memory value.
Diagnostics passes, but the computer does not communicate with the network.	1. Network drivers are not loaded, or driver parameters do not match current configuration. 2. The network controller is not configured for this computer. 3. The network controller interrupt or memory overlaps the interrupt or memory of an expansion board.	1. Make sure the network drivers are loaded and that the driver parameters match the configuration of the network controller. 2. In Windows 95 or Windows NT, select the Network icon at the Control Panel. Reconfigure the driver if necessary, using the Network Setup found in the Control Center. 3. Run Computer Setup and modify the network controller memory value.

Continued

Table G-11 *Continued*

Problem	Cause	Solution
Network controller stopped working when an expansion board was added to the computer.	1. Network drivers are not loaded or driver parameters do not match the current configuration. 2. The cable is not securely connected. 3. The network controller interrupt or memory overlaps the interrupt or memory of another expansion board. 4. The network controller require drivers. 5. The files containing the network drivers are corrupted.	1. Make sure that the network drivers are loaded and that the driver parameters match the configuration of the network controller using Network Setup found in the Control Center. 2. Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device. 3. Run Computer Setup and modify the network controller memory value. 4. Verify that the drivers were not accidentally deleted when the drivers for a new expansion board were installed. 5. Reinstall the network drivers, using the backup diskettes and then run Computer Setup.
Network controller stopped working without apparent cause.	1. The files containing the network drivers are corrupted. 2. The cable is not securely connected. 3. The network controller is defective.	1. Reinstall the network drivers using the backup diskettes and then run Computer Setup. 2. Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device. 3. Replace the network controller or system board.

Resolving Audio Hardware Conflicts

Hardware conflicts occur when two or more peripheral devices contend for the same signal lines or channels. Conflicts between the audio interface and another peripheral device may be due to the settings of the base I/O addresses, interrupts, or DMA channels. The audio interface typically has the following settings:

Table G-12
Audio Interface Settings

Item	Setting
Base I/O address	220H
OPL III I/O address	388-38Bh
Interrupt	IRQ 5
8-bit DMA	Channel 1

To resolve hardware conflicts:

1. Change the hardware settings of your audio card or the peripheral card in your system if the peripheral card is using the audio interface setting. You can change settings for integrated audio using Computer Setup.

2. If you are unsure of the settings of the peripheral cards, you can isolate the source of the problem by temporarily removing all optional and essential cards, such as the disk controller. After that, add the cards back one at a time until the card that is causing the conflict is found.

appendix **H**

INTEL 440LX CHIPSET MEMORY LIMITATIONS

The Intel 440LX Chipset has many functions, one of which is memory support. The Compaq Deskpro 2000 Series of Personal Computers with the Intel Pentium II processor comes standard with three DIMM sockets. Due to inherent architectural limitations, the Intel 440LX chipset does not support any DIMMs comprised of $\times 4$ (pronounced "by 4") SDRAMs nor some combinations of DIMMs with $\times 8$ and $\times 32$ SDRAMs in the 3-socket configuration. Below is a brief explanation of how to determine whether a DIMM is $\times 4$, $\times 8$, or $\times 32$.

Each SDRAM is essentially a large table of rows and columns. Each row corresponds to one address. Each column in the row corresponds to a bit of data. When a row is accessed, it will output all of the data in its columns for that row onto the data bus. The number of columns for each SDRAM is either 4, 8, 16, or 32. This is referred to as the data width of the SDRAM and is specified as $\times 4$, $\times 8$, $\times 16$, or $\times 32$.

The SDRAMs that make up a DIMM are built using either 16-megabit (Mb) memory technology or 64-Mb memory technology. This simply means that each chip is capable of storing either 16×10^6 bits of information or 64×10^6 bits of information.

The size of the SDRAM is given by stating the number of rows by the number of columns. When multiplied together, the number of rows times the number of columns should equal the memory technology used. Thus, a $\times 8$ SDRAM built using 16 Mb technology has 2×10^6 rows. The total size of the SDRAM is specified as 2M$\times$8 bits. If the $\times 8$ SDRAM was built using 64 Mb technology, then there would be 8×10^6 rows and the total size of the SDRAM would be specified as 8M$\times$8. By knowing the width of each SDRAM, the total number of chips needed for each DIMM can be determined.

To identify the SDRAM data width, use the total memory of the DIMM, the total number of SDRAMs, and the information in Table H-1. Not all of the parameters are supported configurations. The key to identifying unsupported memory configurations is to know the data width ($\times 4$, $\times 8$, $\times 16$, or $\times 32$) of the individual SDRAMs that make up the DIMM. The best way to do this, although not foolproof, is to use the data presented in Table H-1. By knowing the total size of the DIMM and how many SDRAMs are per side of the module, the memory technology and data width of the SDRAMs can be determined.

Table H-1
SDRAM Memory Technologies

SDRAM Size	Address Locations	SDRAM Width	Number Of Chips Non-ECC (64 bits)	Number Of Chips ECC (72 bits)	DIMM Size
1M×16	1M	×16	4 chips total, 1 side	5 or 6 chips total -1 side	8 MB
1M×16	1M	×16	8 chips total, 4 per side	10 or 12 chips total, 5 or 6 per side	16 MB
2M×8	2M	×8	8 chips total , 1 side	9 chips total , 1 side	16 MB
2M×8	2M	×8	16 chips total, 8 per side	18 chips total, 9 per side	32 MB
4M×4	4M	×4	16 chips total , 1 side	18 chips total, 1 side	32 MB
4M×4	4M	×4	32 chips total, 16 per side	36 chips total, 18 per side	64 MB
4M×16	4M	×16	4 chips total, 1 side	5 or 6 chips total, 1 side	32 MB
4M×16	4M	×16	8 chips total, 4 per side	10 or 12 chips total, 5 or 6 per side	64 MB
8M×8	8M	×8	8 chips total , 1 side	9 chips total , 1 side	64 MB
8M×8	8M	×8	16 chips total, 8 per side	18 chips total, 9 per side	128 MB
16M×4	16M	×4	16 chips total , 1 side	18 chips total, 1 side	128 MB
16M×4	16M	×4	32 chips total, 16 per side	36 chips total, 18 per side	256 MB

Note: This information is intended to be used as a guide to identifying the memory technology used for SDRAM DIMMs and may not include all technologies. Some of the configurations may not exist in the marketplace.

For example, a 32-MB DIMM with 8 chips per side for 16 chips total is most likely comprised of 16 Mb (2M×8) technology SDRAMs giving a data width of ×8.

That same 32-MB DIMM with only 4 chips on one side is most likely comprised of 64 Mb (4M×16) technology SDRAMs with a data width of ×16.

Table H-2 shows which configurations of ×8 and ×32 DIMMs are supported.

Table H-2 Supported Memory Configurations			
DIMM SLOT			**Supported**
1	**2**	**3**	**Configuration**
×8	×8	×8	Yes
×8	×8	×32	No
×8	×32	×8	Yes
×8	×32	×32	No
×32	×8	×8	Yes
×32	×8	×32	No
×32	×32	×8	Yes
×32	×32	×32	Yes
None	×32	×8	Yes
×32	None	×8	Yes
None	×8	×32	No
×8	None	×32	No

Note: ×4 DIMMs are not supported in any slot or configuration.

With a ×32 DIMM in slot 3, a ×8 DIMM is NOT supported in either slots 1 or 2. All other combinations of DIMMs (with the exception of the ×4's) are supported.

If the ROM encounters a ×4 DIMM or any of the unsupported ×8/×32 combinations in the system during POST, the ROM will issue a "213 – Incompatible DIMM in Slot x,x,x" error message and halt the processor (the system will not boot). The "x" in the error message equals the slot number(s) of the incompatible DIMM(s). If an unsupported configuration is found, the solution is to replace the ×4 DIMM or move the ×8/×32 DIMMs into a supported configuration.

Index