COMPAQ

Maintenance & Service Guide

Compaq Deskpro EN Series
of Personal Computers
Small Form Factor and
Net PC Models

314271-001

314082-001

Notice

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Small Form Factor and Net PC Models

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Compaq Computer Corporation

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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 EN Series, Small Form Factor and Net PC Models. Only authorized technicians trained by Compaq should attempt to repair this equipment.

Compaq Computer Corporation reserves the right to make changes to the Small Form Factor and Net PC Models 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.
- Folder or directory names that are not in command lines are presented in uppercase type as shown here: DIRECTORY.
- 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 (7.6-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 serial number is located on the top of the system unit cover at the right front corner and also on the rear of the computer.

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*

chapter 1

PRODUCT DESCRIPTION

This chapter describes the model offerings and features of the Compaq Deskpro EN Series of Personal Computers, Small Form Factor and Net PC models.

Net PC and Small Form Factor Model

1.1 Compaq Deskpro EN Series of Personal Computers

1.1.1 Small Form Factor Models

The Small Form Factor models come standard with:

- 1.44-MB diskette drive
- Intel Pentium II Microprocessor with MMX Technology
- Non-ECC SDRAM memory
- 4-MB embedded ATI RAGE PRO TURBO AGP 2X graphics memory; upgradeable to 8 MB
- 512-KB Internal Cache

Configuration Code	SDRAM (MB) Min/Max	Processor/Bus Speed (MHz)	Ultra ATA Hard Drive (GB)	CD-ROM Drive	OS
CC32	32/256	300/66	3.2	-	Win 95
CC33	32/256	300/66	3.2	24X	Win 95
CC34	64/256	300/66	3.2	-	Win NT 4.0
CBM2	32/256	333/66	3.2	-	Win 95
CBM3	32/256	333/66	3.2	24X	Win 95
CBM4	64/256	333/66	3.2	-	Win NT 4.0
CBN2	32/256	350/100	6.4	-	Win 95
CBN3	32/256	350/100	6.4	24X	Win 95
CBN4	64/256	350/100	6.4	-	Win NT 4.0
CBN5	64/256	350/100	6.4	24X	Win NT 4.0
CBP2	32/256	400/100	6.4	-	Win 95
CBP3	32/256	400/100	6.4	24X	Win 95
CBP4	64/256	400/100	6.4	-	Win NT 4.0
CBP5	64/256	400/100	6.4	24X	Win NT 4.0

1.1.2 Net PC Models

The Net PC models come standard with:

- Intel Pentium II Microprocessor with MMX Technology
- Non-ECC SDRAM memory.
- 4-MB embedded ATI RAGE PRO TURBO AGP 2X graphics memory; upgradeable to 8 MB
- 512-KB Internal Cache

The Net PC models do *not* come with a either a diskette drive or CD-ROM drive.

Configuration Code	SDRAM (MB) Min/Max	Processor/Bus Speed (MHz)	Ultra ATA Hard Drive (GB)	OS
CC62	32/256	300/66	3.2	NT 4.0
CBS2	32/256	400/100	6.4	NT 4.0

1.2 Features

Item	Description
Processor: Intel Pentium II Processor with MMX Technology 300 to 400 MHz	**Audio** Embedded 16-bit full duplex audio featuring Compaq *PREMIER•SOUND*
Bus Speed 66 to 100 MHz	**Hard drive** 3.2-GB and 6.4-GB SMART II Ultra ATA
Architecture PCI/ISA/AGP, 242-byte CMOS RAM, battery backed plug and play capability is standard	**Cache** 512-KB, L2 synchronous pipeline burst SRAM, direct mapped, write-back with no write allocates
Chipset Intel 440BX/PIIX-4E	**Network interface** Embedded Compaq 10/100 TX Intel WOL UTP with Remote Wakeup
Memory 100 MHz, non-ECC (standard) SDRAM 100-MHz, ECC (optional) SDRAM 32-MB (minimum) to 256-MB (maximum) 2 DIMM sockets available	**Hard Drive Controller (PCI)** Ultra ATA, standard Enhanced IDE, supported UltraSCSI, supported with card Wide UltraSCSI, supported with card
Intelligent Manageability features Initial Configuration and Deployment Asset Tracking and Security Software Updating and Management Fault Notification and Recovery Building Blocks and Partners	**Operating System**, **Small Form Factor** Windows 95 Windows NT Windows 98 Compatible **Operating System, Net PC** Windows NT
Bays, **Small Form Factor** 3.5-inch external 3.5-inch internal 5.25-inch external	**I/O ports** (standard) Serial (COMA and COMB) Parallel USB (2, double-stacked) RJ-45 Monitor Keyboard Mouse Microphone input Line Out
Bays, Net PC 3.5-inch internal	
Flash ROM BIOS	
Expansion slots, Small Form Factor One 7-inch PCI One 7-inch PCI/ISA combination	**Graphics** Embedded ATI RAGE PRO TURBO AGP 2X with 4-MB SGRAM (upgradeable to 8 MB)
Expansion slots, Net PC Two 7-inch PCI	**Compaq Enhanced Keyboard**, standard with MS Windows-specific keys
Diskette drive, Small Form Factor only One 3.5-inch drive, 1.44-MB standard	**CD-ROM drive, Small Form Factor only** 24X Max Slimline CD-ROM Drive (select models)
Internal speaker, standard	**Internal battery**, standard
Power supply fan, standard	**Two-button mouse**

1.3 Design Overview

The Small Form Factor and Net PC models are designed for tool-free accessibility that enhances the serviceability. The Small Form Factor model may be placed on a desktop or mounted underneath the desktop using an optional mounting bracket. The case, which is 35 to 50 percent smaller than conventional desktop PCs, can support a up to a 21-inch monitor and up to 100 pounds of distributed weight in the desktop mode.

The cover can be easily removed by pressing the two quick-release cover latches located on either side of the front bezel and slide the hood forward. Color-coded graphic instructions located on the power supply assist in further disassembly procedures. By pressing the drive release latches located on each side of the drive, the hard drive, diskette drive, and CD-ROM drives can be released without removing any screws.

The Easy Access Drive Bay tilts up and away from the chassis to provide quick, easy access to components beneath the bay, including the memory modules and processor.

The removable expansion board cage has no screws and can be lifted directly from the chassis, allowing easy access to any expansion boards and to components beneath the cage.

The Easy Access Power Supply is mounted in the right rear corner of the chassis and—using a pair of built-in hinges—tilts up and away from the chassis, providing quick access to the system board. The AC input cord must be removed prior to disconnecting the power supply from the system board.

The system board is easily removed from the chassis after the cover and expansion board cage are removed, and the power supply and hard drive cage are tilted up. Details of the disassembly procedure are found in Chapter 5, “Removal and Replacement Procedures.”

1.4 Preloaded Software

The following software is preloaded on the computer:

- Compaq Diagnostics for Windows
- Compaq support software and device drivers
- Online *Safety & Comfort Guide* (when English is the chosen language)
- Intelligent Manageability
- Power Management with Energy Saver features
- Security Management
- Remote Management Tools
- Microsoft Windows 95 (Small Form Factor models)
- Microsoft Windows NT (Small Form Factor and Net PC models)

1.4.1 Ordering Additional Operating System Drivers

If you plan to install an operating system other than the operating system that came with your computer, you must install the corresponding Compaq device drivers and utilities before attempting to use the computer.

To obtain copies of suitable device drivers and utilities, order the *Compaq Support Software CD for Compaq Desktop, Portable, and Workstation Products.* This CD contains the latest device drivers, utilities, and flashable ROM images needed to run MS-DOS, Windows 3.1, Windows 95, Windows NT 3.51 and 4.0, IBM OS/2, and NetWare on the Compaq commercial desktop product.

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.

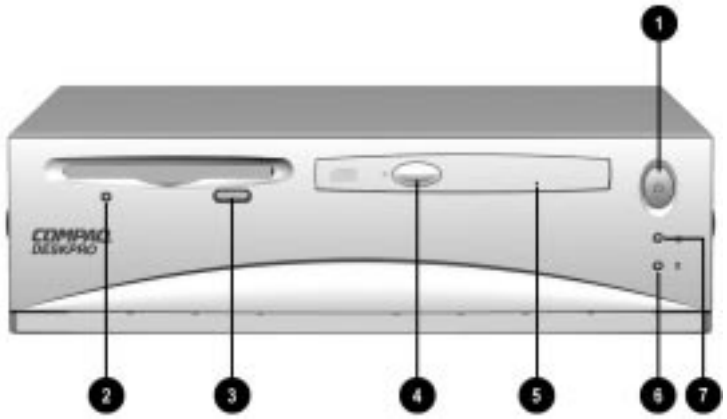
The annual subscription provides continuous access to the latest developments, while the single CD-ROM offers information as it is needed.

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 Chapter 5, "Removal and Replacement Procedures." The serial number is necessary for all purchases.

1.5 External Computer Features

The Small Form Factor and Net PC models ship with a mouse and keyboard. A Compaq color monitor or other compatible monitor, which is also required to operate the computer, must be purchased separately.

1.5.1 Front Panel Controls and LEDs



Front Panel Controls and LEDs on the Small Form Factor Model

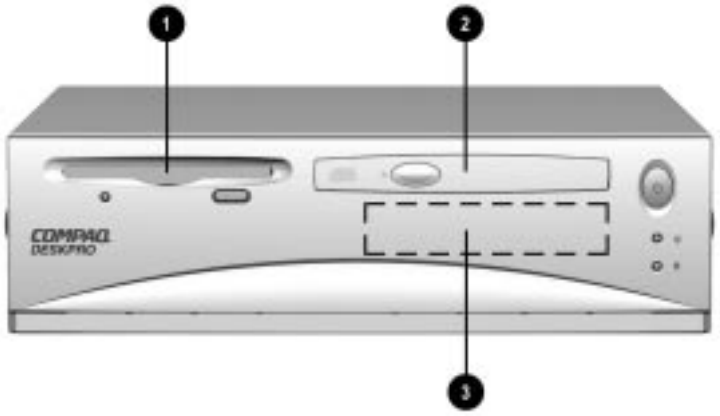
❶ Power Button
❷ Diskette Drive Activity Light*
❸ Diskette Eject Button*
❹ CD-ROM Drive*
❺ CD-ROM Emergency Eject Hole
❻ Hard Drive Activity Light
❼ Power-On Light

*Small Form Factor models only. Net PC models do not feature diskette or CD-ROM drives.

The lights on the computer provide information about computer operation. When the power button ❶ is turned on, the power-on light ❼ is green.

When the hard drive activity light ❻ or diskette drive activity light ❷ is on, the drive is either reading information from or storing information on the disk.

1.5.2 Drive Positions



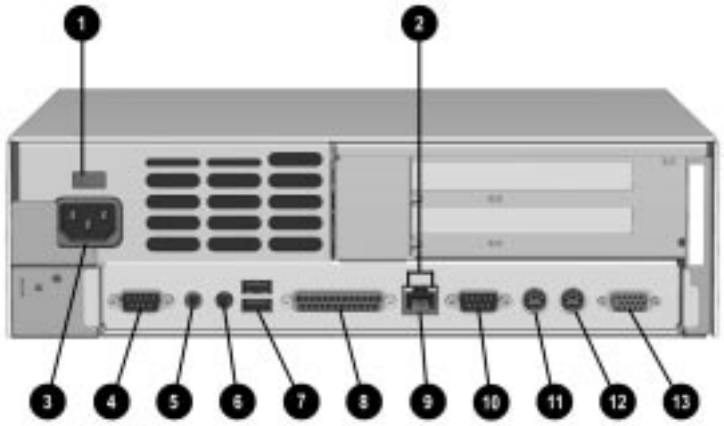
Drive Positions on the Small Form Factor Model

❶ 3.5-inch, third-height, standard, 1.44-MB diskette drive*
❷ 5.25-inch drive bay for optional Slimline CD-ROM drive*
❸ 3.5-inch, third-height, standard hard drive

*Small Form Factor models only. Net PC models do not feature a diskette drive or CD-ROM drive.

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. Review Chapter 2, "Software Reference," for information.

1.5.3 Rear Panel Connectors and Indicators



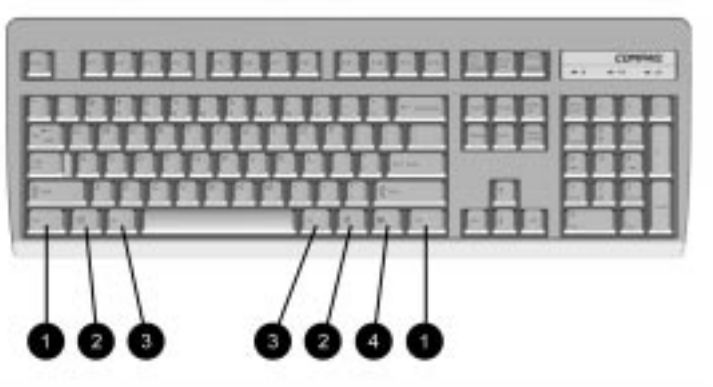
Rear Panel Connectors and Indicators

❶ Voltage Select Switch
❷ Ethernet RJ-45 Activity Lights
❸ Power Cord Connector
❹ Serial Connector (COM A)
❺ Audio Line Out (stereo, non amplified)
❻ Microphone Connector (mono)
❼ Double-stacked USB Connectors
❽ Parallel Connector
❾ Ethernet RJ-45 Connector
❿ Serial Connector (COM B)
⓫ Mouse Connector
⓬ Keyboard Connector
⓭ Monitor Connector

Connectors include icons for ease of identification.

Audio Line Out connector requires an amplified speaker.

1.6 Compaq Enhanced Keyboard

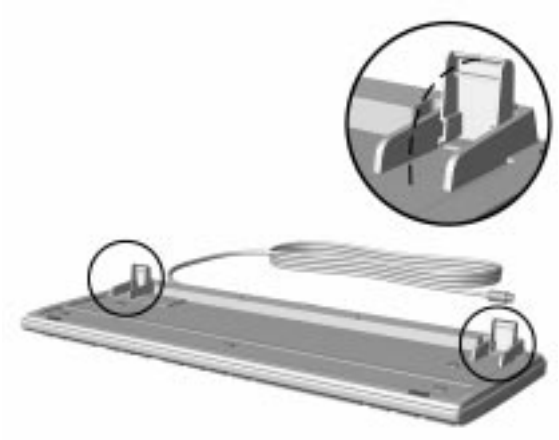


Enhanced Keyboard

❶	Ctrl	Used in combination with another key, its effect depends on the software application you are using.
❷	Windows Logo Keys*	Used to open the Start menu. Used in combination with another key, its effect depends on the software application you are using.
❸	Alt	Used in combination with another key, its effect depends on the software application you are using.
❹	Windows Application Key*	Opens a context menu for the software program you are using.

*Keys available in select geographic regions.

The keyboard has feet on the bottom that enable the user to tilt the keyboard to a more comfortable typing angle.



Keyboard Tilt Feet

chapter 2

SOFTWARE REFERENCE

2.1 Installing the Operating System

CAUTION: Do not add optional hardware devices to your computer until the operating system is successfully installed. Doing so may cause errors and may prevent the operating system from installing properly.

2.1.1 Microsoft Windows 95 or Windows 98

The first time the computer is turned on, Microsoft Windows is automatically installed. This takes approximately 5 to 15 minutes, depending on your system hardware configuration. At the beginning of the installation process, the user is prompted to select the appropriate language for the operating system. Read and follow the instructions that appear on the screen to complete the installation.

CAUTION: Once the automatic installation has begun, DO NOT TURN OFF THE COMPUTER UNTIL THE PROCESS IS COMPLETE. Turning off the computer during the installation process might damage the software that runs the computer.

When the Welcome to Windows screen is displayed, the installation process is complete.

2.1.2 Microsoft Windows NT Workstation 4.0

The first time you turn on your computer, Microsoft Windows NT Workstation is automatically installed for you. This takes approximately 30 minutes, depending on the system hardware configuration. At the beginning of the installation process, the user is prompted to select the appropriate language for the operating system. Read and follow the instructions that appear on the screen to complete the installation.

Installing Windows NT Workstation 4.0 Over a Network

Network installation is used primarily for installing or upgrading Microsoft Windows NT Workstation over a local area network. It can also be used to install additional drivers or files with Windows NT.

This capability does not imply the grant of a site license for Microsoft Windows NT Workstation and should only be used to install the operating system on computers for which the appropriate software license has already been obtained.

This installation method should be used to deploy Windows NT using a distribution share point over a network connection.

The Windows NT installation that is completed when the computer is first turned on creates an I386 directory. This directory and its subdirectories provide the Compaq-specific integration of Windows NT for the computer model. This image, license permitting, can be used as a distribution share point to deploy Windows NT over a network connection.

To use distribution share point to install or upgrade Windows NT, see the Windows NT Resource Kit and its documentation.

Installing or Upgrading Device Drivers

To install hardware devices such as a printer, a display adapter, a network adapter, or other device after the Windows NT installation is completed, Windows NT needs access to the appropriate software drivers for the devices.

The I386 directory and its subdirectories provide the Compaq-specific integration of Windows NT for the computer model and include device drivers supported by Windows NT.

When prompted for the I386 directory on the Windows NT CD, replace the path specification with C:\I386 or use the browse button of the dialog box to browse the computer for the I386 folder. This points Windows NT to the appropriate drivers and allows installation of the device to be completed.

Creating an Emergency Repair Diskette

The following section applies only to computers equipped with a diskette drive.

After installing Microsoft Windows NT, create an Emergency Repair Diskette. To create the Emergency Repair Diskette, one blank, formatted diskette is needed. Complete the following steps:

1. Click Start → Compaq Information Center → Create Emergency Repair Diskette.
2. Read and follow the instructions that appear on the screen.

A set of boot diskettes should also be created. These diskettes are required to start the computer should the Emergency Repair Diskette be needed. To create boot diskettes, you need three blank, formatted diskettes.

1. Click Start → Compaq Information Center → Create Boot Diskettes.
2. Read and follow the instructions that appear on the screen.

Using the Emergency Repair Diskette

The following section applies only to computers equipped with a diskette drive.

To use the Emergency Repair Diskette if the computer is not equipped with the LS-120 drive, insert the first boot diskette in the diskette drive and restart the computer. Follow the instructions displayed on the screen.

To use the Emergency Repair Diskette if the computer is equipped with the LS-120 drive, follow the instructions below:

1. Restart the computer using the Microsoft Windows NT Boot Disk 1.
2. Press the F6 key when the message “Setup is inspecting your computer’s hardware configuration…” appears on your screen.
3. When asked if you want to specify a storage device, press S and select the Compaq ATAPI/IDE/LS-120 Controller from the list.
4. When asked again if you want to specify a storage device, press the Enter key. Follow the rest of the installation procedures as outlined in the operating system documentation from Microsoft.

2.2 Registering the Computer

The computer should be registered with Compaq. Registration establishes a record of ownership and gives the user an opportunity to receive product announcements, updates, and other communications periodically. Registration is easy—just visit Compaq's Web site at www.compaq.com/register and follow the instructions that appear on the screen.

2.3 Compaq Software

The Microsoft Windows 95, Windows 98, or Windows NT Workstation operating system is preinstalled on the computer and will be configured automatically the first time the computer is turned on. The following Compaq software will also be installed at that time on selected models:

- Computer Setup Utilities and diagnostic features
- Compaq Support Software including device drivers
- Online *Compaq Safety & Comfort Guide*
- Intelligent Manageability
- Enhanced Compaq Insight Personal Edition (Diagnostics for Windows)
- Compaq Insight Management agents
- DMI Support
- Power Management with energy saver features
- Security Management tools
- Support Software Management tools

Certain drivers and utilities are available only in selected languages. You can obtain the latest version of these files, in English and selected other languages, in one of three ways:

- *Compaq Support Software CD for Compaq Desktop, Portable, and Workstation Products* (refer to "Enhanced Support Software CD and World Wide Web Site" in this chapter for ordering information)
- Compaq Web Site at www.compaq.com
- *Compaq Restore CD*, which is supplied with many Deskpro models

2.4 Compaq Computer Setup Utilities and Diagnostic Features

Compaq Computer Setup Utilities and diagnostic features provide information needed about the computer system when contacting Compaq Customer Support. These tools can also be used to:

- Change factory default settings, and to set or change the system configuration, which may be necessary when you add or remove hardware.
- Determine if all of the devices installed on the computer are recognized by the system and functioning properly.
- Determine information about the operating environment of the computer.
- Solve system configuration errors detected but not automatically fixed during the Power-On Self-Test (POST).
- Establish and manage passwords and other security features.
- Establish and manage energy-saving timeouts.

2.4.1 Computer Setup Utilities

Use Computer Setup Utilities to do the following:

- Change factory default settings.
- Set the system date and time.
- Set, view, change, or verify the system configuration, including settings for processor, graphics, memory, audio, storage, communications, and input devices.
- Modify the boot order of bootable devices such as hard drives, diskette drives, CD-ROM drives, DVD-ROM drives, or PD-CD drives.
- Enable Quick Boot, which is faster than Full Boot but does not run all of the diagnostic tests run during a Full Boot. You can set your system to:
  - ❏ always Quick Boot (default);
  - ❏ periodically Full Boot (from every 1 to 30 days); or
  - ❏ always Full Boot.
- Enable or disable Network Server Mode, which allows the computer to boot the operating system when the power-on password is enabled. The keyboard and mouse remain locked until the power-on password is entered.
- Select Clean or Descriptive mode for displaying Power-On Self-Test (POST) messages. Clean mode suppresses most POST messages, such as memory count, product name, and other non-error text messages. If a POST error occurs, the error is displayed regardless of the mode selected. To manually switch to Descriptive mode during POST, press any key (except F10 or F12).
- Establish an Ownership Tag, the text of which is displayed each time the system is turned on or restarted.
- Enter the Asset Tag or property identification number assigned by your company to this computer.
- Enable power-on password prompting during system restarts (warm boots) as well as during power-on.
- Establish a setup password that controls access to Computer Setup and the settings described in this section.

- Secure the serial, USB, or parallel ports so that they cannot be used until they are unsecured.
- Enable or disable QuickLock and QuickBlank features.
- Enable or disable removable media boot ability.
- Enable or disable removable media write ability.
- Solve system configuration errors detected but not automatically fixed during the Power-On Self-Test (POST).
- Replicate your system setup by saving system configuration information on diskette and restoring it on one or more computers.

Using Computer Setup Utilities

To access the Computer Setup Utilities menu, complete the following steps:

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.

A choice of five headings appears in the Computer Setup Utilities menu: File, Storage, Security, Power, and Advanced.

3. Using the arrow keys or the Tab key, select the option you want and press the Enter key. To return to the Computer Setup Utilities menu, press the Esc key.
4. To apply and save changes, select File → Save Changes and Exit. If you selected an option that automatically restarted the computer, changes were applied at that time. If you have made changes that you do not want applied, select Ignore Changes and Exit. If you have already applied changes you now want to eliminate, select Set Defaults and Exit. This option will restore the original system defaults.

2.4.2 Computer Setup Menu

Heading	Option	Description
File	System Information	Lists product name, processor type/speed/stepping, CPU serial number, system ROM date, system board revision, installed memory size, and asset tracking number.
	Set Time and Date	Allows you to set system time and date.
	Save to Floppy	Saves system configuration to a blank 1.44-MB diskette.
	Restore from Floppy	Restores system configuration from a diskette.
	Set Defaults and Exit	Restores factory default settings.
	Ignore Changes and Exit	Exits Computer Setup without applying or saving any changes.
	Save Changes and Exit	Saves changes to system configuration and exits Computer Setup.
Storage	Diskettes	Lists the currently installed drive A (preinstalled diskette drive) and drive B devices.
	Removable Media	Enables/disables removable media booting and removable media writing. **Note**: After saving changes to Removable Media, the computer will restart. Turn the computer off, then on, manually.
	IDE Devices	Lists information regarding IDE devices connected to the system. ATAPI devices (CD-ROM, DVD-ROM, tape) are listed as ATAPI devices.
	IDE Drive Timing	Allows you to set hard drive to Ultra-DMA (Ultra-ATA), EDMA, or PIO mode operation.
	IDE Drive Translation	Enables/disables IDE drive translation.
	Boot Order	Allows you to specify boot order of installed peripheral devices (such as LS-120 drive, diskette drive, hard drive, SCSI drive, CD-ROM drive, or DVD-ROM drive).
Security	Setup Password	Enables setup (administrator) password. See the “Security Management” section of this guide for more information.
	Power-On Password	Enables power-on password. Specifies prompting for Power-On Password. See “Security Management” for more information.
	Password Options	Enables/disables network server mode, keyboard QuickLock, QuickBlank screen when locked, and QuickLock in energy saver mode. See “Security Management” for more information. **Note:** This selection will appear only if a power-on password is set.
	Smart Cover	Enables/disables Smart Cover Sensor and Cover Lock. Also lists most recent cover removal. (Feature supported on select models only.) See “Security Management” for more information.
	Device Security	Enables/disables serial, parallel, and USB ports and audio security.

continued

Computer Setup Menu *Continued*

	Network Service Boot	Enables/disables Network Service Boot. (Feature supported on select models only.)
	System IDs	Allows you to set Asset Tag and Ownership Tag. See "Security Management" for more information. Allows setting of Chassis Serial Number if current number is invalid. Also allows you to set keyboard locale setting (e.g., English or German) for System ID entry.
Power	Energy Saver	Allows you to set energy saver mode to advanced, disabled, or minimal.
	Timeouts	Allows you to enable/disable timeouts or manually select timeout values. **Note:** This selection will only appear when energy saver mode is set to advanced.
	Energy Saver Options	Allows you to set power button configuration (on/off or suspend/wakeup) Allows user to enable/disable power LED blink in suspend mode. **Note:** This selection will not appear if the energy saver mode is disabled.
Advanced*	Power-On Self Test	Allows you to set POST mode (QuickBoot or FullBoot) and enables/disables POST messages.
	Onboard Devices	Allows you to set resources for onboard system devices (serial port, parallel port, etc.).
	PCI Devices	Lists currently installed PCI devices and their IRQ settings. Allows you to reconfigure IRQ settings for these devices or to disable them entirely.
	ISA PnP Devices	Lists current settings of plug and play (PnP) devices. Enables or disables PnP devices. **Note:** Will not appear if there are no PnP devices currently installed.
	Bus Options	Enables/disables PCI bus mastering, PCI reset on warm boot, and PCI VGA palette snooping. Allows you to set ISA back-to-back I/O (fast/legacy) delay and bus priority (ISA/PCI).
	Device Options	Allows you to set printer mode (flexible/standard), NumLock state at power-on, and Erase-Eaze Keyboard support.
	PCI VGA Configuration	Appears only if there are multiple PCI video adapters in the system. Allows users to specify which VGA controller will be the "boot" or primary VGA controller.

***** These options should be used by advanced users only.

2.5 Computer Diagnostics

Compaq strongly recommends that you create a diagnostics diskette as soon as you begin to use the computer. This diskette will play an important role in the restoration process if you ever experience a major system failure. It will also allow you to run the Computer Checkup (TEST) or View System Information (INSPECT) diagnostic programs.

Another Compaq diagnostic feature is Enhanced Compaq Insight Personal Edition (Diagnostics for Windows), described later in this guide.

2.5.1 Create a Diagnostics Diskette

Deskpro EP Series, Deskpro EN Series, and Deskpro EN Series, Small Form Factor

To create a bootable, DOS-based Diagnostic Diskette, * run the SOFTPAQ executable file found in C:\DIAGDISK\ to extract the necessary files. Insert a blank, 1.44MB formatted diskette into the diskette drive, then run C:\DIAGDISK\PDIAG\MAKEDISK.BAT.

To obtain the SOFTPAQ executable filename, run DIR C:\DIAGDISK\SP*.EXE.

* Depending on the model, this process may require two blank 1.44MB diskettes.

Deskpro EN Series

Using the Windows or Windows NT operating system:

Click Start → Compaq Information Center → Create Diagnostics Disk. Insert a diskette into the diskette drive and follow the instructions on the screen.

2.5.2 Computer Checkup (TEST)

Use Computer Checkup (TEST) in the following instances to:

- Determine if all the devices installed on the computer are recognized by the system and functioning properly. Running TEST is optional but recommended after installing or connecting a new device.
- Save, print, or display the information generated by TEST. You should run TEST and have the printed report available before placing a call to the Compaq Customer Support Center.
- 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.

2.5.3 View System Information (INSPECT)

Use View System Information (INSPECT) to:

- View information about the system once it has been configured.
- Save, print, or display the information generated by INSPECT. You should run INSPECT and have the printed report available before placing a call to the Compaq Customer Support Center.
- 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.

The information provided by INSPECT includes:

- Contents of the operating system startup files
- Current memory configuration
- ROM versions
- Type of processor and coprocessor
- Diskette, CD-ROM, DVD-ROM, tape, or hard drives installed
- Active printer and communications interfaces
- Modem type installed
- Graphics settings
- Windows *WIN.INI* file details

Categories or items of information displayed by View System Information (INSPECT) are similar to but may vary slightly from those available in Compaq Diagnostics for Windows.

Using Computer Checkup (TEST) or View System Information (INSPECT)

Before you run Computer Checkup (TEST) or View System Information (INSPECT), you must create a diagnostics diskette. See "Create a Diagnostics Diskette" for instructions.

1. Reboot your computer from the diagnostics diskette you have created. Press Enter to bypass the title screen, if necessary.
2. Select either Computer Checkup (TEST) or View System Information (INSPECT).

When running TEST:

1. Select the option to view the device list. A list of the installed hardware devices appears.
2. 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 3.
   - ❑ If the list is incorrect, be sure that any new devices are installed properly.

3. 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.
4. Follow the instructions on the screen as the diagnostic tests are run on the devices.

To exit either TEST or INSPECT, press the Esc key to reach the Exit option. Then press Enter.

2.5.4 Enhanced Compaq Insight Personal Edition (Compaq Diagnostics for Windows)

Enhanced Compaq Insight Personal Edition is a component of Intelligent Manageability that allows you to view:

- System overview
- AssetControl information
- Input devices
- Communications ports
- Storage devices
- Graphics information
- Memory configuration
- Security management settings
- System health
- Operating system
- Windows version

Depending on the version, Compaq Insight Personal Edition may include diagnostic tests to determine if all the devices installed on the computer are recognized by the system and are functioning properly.

Using Compaq Insight Personal Edition

1. Select the Compaq Insight Personal Edition icon or the Compaq Diagnostics icon, located in the Control Panel.

   The screen displays an overview of the computer hardware and software.

2. For specific hardware and software information, select a category from the Categories menu or from the toolbar.

   ✎ As you move your cursor over the toolbar icons, the corresponding category names appear near the cursor.

3. To display more detailed information in a selected category, click More in the Information Level box.

   ✎ Categories or items of information displayed by Compaq Insight Personal Edition are similar to but may vary slightly from the information presented in View System Information (INSPECT).

4. Review and print this information.

   ✎ To print the information, click File, then select Print. Select one of the following options: Detailed Report (All Categories), Summary Report (All Categories), or Current Category. Click OK to print the report you selected.

5. To exit Compaq Insight Personal Edition, click File, then click Exit.

Running Diagnostic Tests

If your version of Compaq Insight Personal Edition includes diagnostic testing utilities, four tabs will appear next to Overview: Test, Status, Log, and Error.

1. Select the Test tab.
2. Select one of the following options:
   - ❏ **Quick Test—**Runs a quick, general test on each device with a minimal number of prompts.
   - ❏ **Complete Test—**Runs maximum testing of each device with minimal prompts.
   - ❏ **Custom Test—**Runs only the tests you select. To select specific devices or tests, find the device in the list, then click the box beside each test to select or deselect it. When selected, a red check mark appears in the box.
3. Select Interactive Mode or Unattended Mode.
4. In Interactive Mode, the diagnostic software will prompt you for input during tests that require it. Some tests require interaction and will display errors or halt testing if selected in conjunction with Unattended Mode.
5. Click the Begin Testing button.

   Test Status is displayed, showing the progress and result of each test.

6. If errors are found, click the Error tab to display more detailed information and recommended actions. By following the recommended actions, you may be able to solve some problems yourself.
7. Click Print or Save the error information in case you need to contact your Compaq authorized dealer, reseller, or service provider for assistance.
8. To exit Compaq Insight Personal Edition, click File, then click Exit.

2.6 Protecting Your Software

To protect software from loss or damage, you should keep a backup copy of all system software, applications, and related files stored on the hard drive. You can order a set of backup diskettes from Compaq at nominal cost for all of the software preinstalled on the computer, or you can make a set. Refer to the operating system or backup utility documentation for instructions on making backup copies of data files. Another option is the *Compaq Restore CD,* which accompanies many Deskpro models and enables the user to selectively restore the original Deskpro system software.

2.6.1 Ordering Backup Diskettes

You can order all software as a single set, or you can order the various software packages separately.

> Before calling Compaq to place your order, be sure to have the serial number of your computer available. This number is necessary for all diskette purchases.

For a list of Compaq support telephone numbers, consult the *Contacting Compaq Customer Support* guide.

2.6.2 The Compaq Restore CD

The *Compaq Restore CD* offers easy deployment and recovery of Deskpro system software. Along with the Microsoft operating system CD, the *Compaq Restore CD* enables the user to selectively restore the original Deskpro system software. This can be extremely helpful in the event of hard drive failure or corruption.

The *Restore CD* is specific to each Deskpro model and accompanies many models along with the Microsoft operating system CD.

2.7 Intelligent Manageability

Compaq Intelligent Manageability is the best, most comprehensive set of desktop management solutions in the industry. Providing easy control and management of the desktop and portable PC, Intelligent Manageability delivers significant financial and intangible returns when used to manage distributed PC environments.

Intelligent Manageability is built upon industry-standard building blocks, including DMI 2.0, Web-Based Enterprise Management, Intel's "Wired for Management," SNMP, and Net PC technologies. It is tightly integrated with Compaq Management Solutions Partners and Compaq Insight Manager.

Intelligent Manageability delivers solutions in five areas of primary concern for today's businesses:

- Initial Configuration and Deployment
- Asset Tracking and Security
- Fault Notification and Recovery
- Software Updating and Management
- Building Blocks and Partners

This section provides an introduction to Intelligent Manageability concepts and features. For more detailed information on specific features, refer to the online *Intelligent Manageability Installation and Configuration Guide* (IMINST.HLP) and the online *Intelligent Manageability Guide* (INTMGT3.HLP).

Support for specific features described in this chapter and in the online *Intelligent Manageability Guide* may vary by model or software version.

2.8 Initial Configuration and Deployment

Compaq computers come with a preinstalled set of system software. Automated System Installation and Remote System Installation enable you to replace the preinstalled software with a customized set of system and application software for consistent, standard software deployment. The Compaq Restore CD, ROM-based setup, and ACPI-ready hardware provide further assistance with selective recovery of system software, configuration management and troubleshooting, and power management.

2.8.1 Remote System Installation

Remote System Installation allows you to start and set up your system using the software and configuration information located on a network server. The Remote System Installation feature is usually used as a system setup and configuration tool, and can be used for the following tasks:

- Installing the optional Setup partition. The partition should be installed only if you wish to use the previous generation of Compaq Computer Setup and Diagnostics utilities.
- Formatting a hard drive.
- Installing an operating system.
- Installing application software or drivers.

To initiate Remote System Installation, press F12 when the F12=Network Service Boot message appears in the lower-right corner of the Compaq logo screen. Follow the instructions on the screen to continue the process.

2.9 Asset Tracking and Security

Compaq AssetControl features incorporated into the computer provide key asset tracking data that can be managed using Management Solutions Partners products. Seamless, automatic integration between AssetControl features and Solutions Partners products enables you to choose the management tool that is best suited to your environment and to leverage your investment in existing tools.

Compaq computers are manufactured with the hardware and firmware required to fully support the DMI 2.0 standard.

Compaq also offers several solutions for controlling access to valuable computer components and information. DriveLock prevents unauthorized access to data stored on the hard disk, even when removed from the computer. Remote Security Management enables the system administrator to centrally establish and manage policies for hardware-based security features, such as the Smart Cover Lock and the Ownership tag, for networked PCs. Another solution integrates Memory Change and Smart Cover Sensor alerts with Compaq Insight Manager to deliver proactive notification of tampering with a computer's internal components.

Security features described in the table below can be established from the Compaq Computer Setup Utilities menu.

Feature	Purpose
Removable Media Boot Control	Prevents booting from the removable media drives.
Removable Media Write Control	Prevents writing to the removable media drives.
Serial, Parallel, USB, or Infrared Interface Control	Prevents transfer of data through the integrated serial, parallel, USB (universal serial bus), or infrared interface.
Power-On Password	Prevents use of the computer until the password is entered. This can apply to both initial computer startup and restarts.
QuickLock/ QuickBlank	Disables keyboard and mouse interface, and can blank the screen without exiting applications. The power-on password must be set to enable QuickLock/ QuickBlank.
Setup Password	Prevents reconfiguration of the computer (use of the Computer Setup utility) until the password is entered.
Smart Cover Sensor	Indicates that computer cover or side panel has been removed. Can be set to require the setup password to restart the computer, after the cover or side panel has been removed.

Continued

Feature	Purpose
Smart Cover Lock	Prevents unauthorized access to the internal components. This is a software-controllable cover lock, controlled by the setup password. The Smart Cover FailSafe Key, a device for manually disabling the Smart Cover Lock, is available from Compaq. You'll need the FailSafe Key in case of forgotten password, power loss, or computer malfunction.
Memory Change Alerts	Detects when DIMMs (dual inline memory modules) have been added, moved, or removed; notifies end-user and system administrator. For information on enabling Memory Change Alerts, refer to the online *Intelligent Manageability Guide.*
Ownership Tag	Displays ownership information, as defined by the system administrator, during system startup (protected by setup password).
Cable Lock Provision	Inhibits access to the interior of the computer to prevent unwanted configuration changes or component removal. Can also be used to secure the computer to a fixed object to prevent theft of the computer. Install a padlock with the security bracket to inhibit access to the interior of the computer; add a cable lock to secure the computer to a fixed object.

For more information about Computer Setup, refer to the "Compaq Computer Setup Utilities" section of this chapter. In some cases switches may need to be set. For more information about these switches, refer to the "Connectors, Jumpers, and Switches" chapter.

2.9.1 Password Security

The computer supports security password features, which can be established through the Compaq Computer Setup Utilities menu.

Establishing a Setup Password Using Computer Setup

Establishing a setup password through Computer Setup prevents reconfiguration of the computer (use of the Computer Setup utility) until the password is entered.

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.
3. Select Security, then select Setup Password and follow the instructions on the screen.
4. Before exiting, click File → Save Changes and Exit.

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.

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   ✎ If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.

3. Select Security, then Power-On Password and follow the instructions on the screen.
4. Before exiting, click File → Save Changes and Exit.

Entering a Power-On Password

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

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart 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 or Setup Password

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer. To change the setup password, run Computer Setup.
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 the “National Keyboard Delimiter Characters” section in this chapter for information about the alternate delimiter characters.

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

The new password takes effect the next time you turn on the computer.

Deleting a Power-On or Setup Password

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer. To delete the setup password, run Computer Setup.
2. When the key icon appears, type your current password followed by a slash (/) or alternate delimiter character as shown:

   current password/

Refer to the "National Keyboard Delimiter Characters" section in this chapter for information about alternate delimiter characters.

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.

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

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

Clearing Passwords

If you forget your password, you cannot access the computer. Refer to the "Connectors, Jumpers, and Switches" chapter for instructions on clearing passwords.

2.9.2 Smart Cover Sensor

Smart Cover Sensor is a combination of hardware and software technology that can alert you when the computer cover or side panel has been removed. There are three levels of protection, as described in the following table:

Smart Cover Sensor Protection Levels

Level	Setting	Description
Level 0	Disabled	Smart Cover Sensor is disabled (default).
Level 1	Notify User	When the computer is restarted, the screen displays a message indicating that the computer cover or side panel has been removed.
Level 2	Setup Password	When the computer is restarted, the screen displays a message indicating that the computer cover or side panel has been removed. You must enter the setup password to continue.

Setting the Smart Cover Sensor Protection Level

To set the Smart Cover Sensor protection level, complete the following steps:

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.

3. Select Security, then Smart Cover and follow the instructions on the screen.
4. Before exiting, click File → Save Changes and Exit.

2.9.3 Smart Cover Lock

The Smart Cover Lock is a software-controllable cover lock featured on some Deskpro computers. This lock prevents unauthorized access to the internal components. Computers ship with the Smart Cover Lock in the unlocked position.

CAUTION: For maximum cover lock security, be sure to establish a setup password. The setup password prevents unauthorized access to the Computer Setup utility.

Locking the Smart Cover Lock

To activate and lock the Smart Cover Lock, complete the following steps:

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.

3. Select Security, then select Smart Cover and follow the instructions on the screen.
4. Before exiting, click File → Save Changes and Exit.

Unlocking the Smart Cover Lock

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.

3. Select Security, then select Smart Cover and the Unlocked option.
4. Before exiting, click File → Save Changes and Exit.

Using the Smart Cover FailSafe Key

If you enable the Smart Cover Lock and cannot enter your password to disable the lock, you will need a Smart Cover FailSafe Key to open the computer cover. You will need the key in any of the following circumstances:

- Power outage
- Start up failure
- PC component failure (e.g., processor or power supply)
- Forgotten password

CAUTION: The Smart Cover FailSafe Key is a specialized tool available from Compaq. Be prepared; order this key before you need one.

2.9.4 QuickLock/QuickBlank

QuickLock/QuickBlank disables the keyboard and mouse interface, and can blank the screen, without exiting open applications.

Enabling QuickLock and QuickBlank

1. Turn on or restart the computer. If you are in Windows, click Start → Shut Down → Restart the Computer.
2. When the F10 Setup message appears in the lower-right corner of the screen, press the F10 key. Press Enter to bypass the title screen, if necessary.

   If you do not press the F10 key while the message is displayed, you must turn the computer off, then on again, to access the utility.

3. Select Security, then select Password Options and follow the instructions on the screen.
4. Before exiting, click File → Save Changes and Exit.

Disabling the Keyboard and Mouse Interface

Enter the QuickLock key combination (Ctrl+Alt+L) to disable the keyboard and mouse (or other input device connected to the mouse connector). The applications you are running cannot be accessed, but remain in view, unless the QuickBlank feature is also enabled through the Computer Setup utility.

Enabling the Keyboard and Mouse Interface

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

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

2.9.5 The Cable Lock Provision

A physical security device for your computer may also be available, through the cable lock provision. See your *Guide to Features & Upgrades* for more information on using and installing the cable lock provision.

2.10 Fault Notification and Recovery

Fault Notification and Recovery 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 SNMP-based management products from Compaq Management Solutions Partners, the computer also sends a fault notice to the network management application.

2.10.1 Pentium II Fault Prediction and Prefailure Warranty

When the processor encounters an excessive number of error checking and correcting (ECC) cache memory errors, the computer displays a Local Alert Message. This message contains detailed information about the faulty processor, allowing your to take action before you experience non-correctable cache memory errors. The Prefailure Warranty allows you to replace these processors, free of charge, before they actually fail. Processors with ECC cache memory are available on select Compaq personal computers.

2.10.2 SMART Hard Drive Fault Prediction

The SMART hard drive monitors hard drive activity to predict failures and, in some cases, fix faults before failures 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 hard drives allows you to replace these drives, free of charge, before the drives fail.

SMART hard drives are compliant with the Small Form Factor Committee Specification for Self-Monitoring, Analysis, and Reporting Technology (SMART). 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.

2.10.3 Ultra ATA Integrity Monitoring

Ultra ATA Integrity Monitoring monitors the integrity of data as it is transferred between an Ultra ATA hard drive and the system's core logic. If the computer detects an abnormal number of transmission errors, the computer displays a Local Alert message with recommended actions. An alert is also sent over the network to the system administrator.

2.10.4 ECC Fault Prediction and Prefailure Warranty

When the computer encounters an excessive number of error checking and correcting (ECC) memory errors, the computer 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 personal computers.

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

2.10.5 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 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 hard drive to ensure that critical data will be protected in the event of a hard drive failure.

2.10.6 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 2000 volts without incurring any system downtime or data loss.

2.10.7 Thermal Sensor

The thermal sensor is a hardware and software feature that tracks the internal temperature of the computer. This feature displays a warning message when the normal range is exceeded, which gives you time to take action before internal components are damaged or data is lost.

2.11 Software Updating and Management

Remote ROM Flash, Remote Wakeup, and Remote Shutdown, when integrated with Management Solutions Partners products, deliver on-going management of firmware, 24 hours a day. This supplements the software distribution capabilities of the Solutions Partners products, which can also be used to distribute new applications, device drivers, and other system software. The *Support Software CD* and Web site includes updated ROM images and device drivers which can be distributed to client PCs using these software tools.

For more information, refer to the online *Remote Management Administrators Guide.* The *Remote Management Administrators Guide* is included with the Remote Management Administration Tools, and is available on the *Support Software CD* or at the Compaq Web Site at www.compaq.com.

2.11.1 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*.
- 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.

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.

Your computer must be powered on, or turned on through Remote Wakeup, to take advantage of Remote ROM Flash. Use of Remote ROM Flash also requires an established setup password.

For more information on enabling Remote ROM Flash, refer to the online *Remote Management Administrators Guide*. The *Remote Management Administrators Guide* is included with the Remote Management Administration Tools, and is available on the *Support Software CD* or at the Compaq Web Site at www.compaq.com.

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:

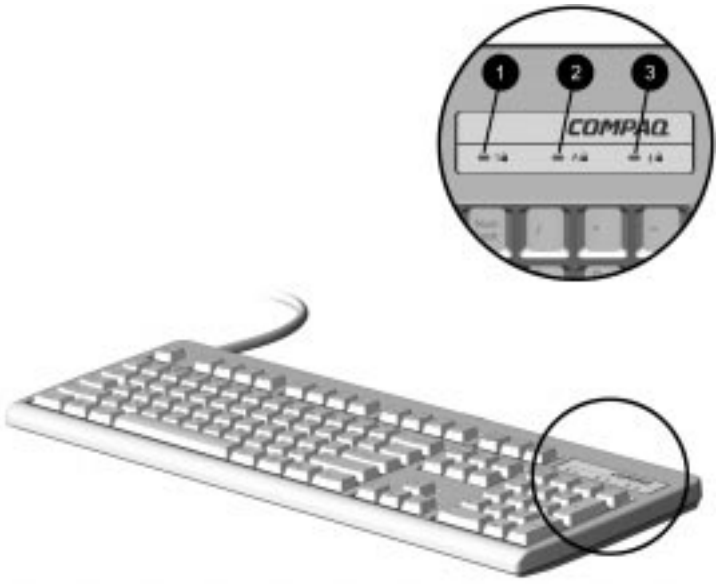
1. Remove any diskettes from the diskette drive and turn off the power.
2. Insert a ROMPaq diskette into the diskette drive.
3. Turn on power to the system.

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

   If the system successfully starts from the diskette and successfully reprograms the ROM, then the three keyboard lights will turn on. A “rising tone” series of beeps also signals successful completion.

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

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.



Keyboard Lights

2.11.2 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.

> Your computer must be powered on, or turned on through Remote Wakeup, to take advantage of Remote Security Management. Use of Remote Security Management also requires an established setup password.

For more information about the Remote Management Setup software and enabling Remote Security Management, refer to the online *Remote Management Administrators Guide*. The *Remote Management Administrators Guide* is included with the Remote Management Administration Tools, and is available on the *Support Software CD* or at the Compaq Web Site at www.compaq.com.

2.11.3 Remote Wakeup and Remote Shutdown

If the computer has an optional network card installed, it may support the Compaq Remote Wakeup and Remote Shutdown functions. These functions allow a system administrator to power on and power off a client computer from a remote location, supported by PC LAN management tools.

> Third-party software tools are required to remotely distribute software.

Remote Wakeup allows the network interface controller to continue functioning, even when power to the computer has been turned off.

> The computer continues to consume a small amount of electricity even after you turn it off. Only when you disconnect the power cord from the electrical outlet does the computer stop consuming electricity.

To enable Remote Wakeup and Remote Shutdown, complete the following steps:

1. Double-click the Network Icon, located in the Control Panel.
2. Double-click the appropriate network controller.
3. Click the Advanced Properties tab.
4. Select Remote Wakeup.
5. Change the value to ON.
6. Click OK to save and apply changes, then click OK to exit the Network dialog.

For more information on using Remote Wakeup and Remote Shutdown, refer to the online *Remote Management Administrators Guide.* The *Remote Management Administrators Guide* is included with the Remote Management Administration Tools, and is available on the *Support Software CD* or at the Compaq Web Site at www.compaq.com.

2.11.4 Replicating Original Setup

This procedure gives an administrator the ability to easily copy one setup configuration to other computers of the same model. This allows for faster, more consistent configuration of multiple computers. To replicate your setup:

1. Access the Computer Setup Utilities menu.
2. Click File → Save to Floppy. Follow the instructions on the screen.
3. To replicate the configuration, click File → Restore from Floppy, and follow the instructions on the screen.

2.11.5 Dual-State Power Button

In Windows 95 or Windows 98, the power button can function either as an on/off switch or as a suspend button. The suspend feature does not turn off power altogether, but instead causes the computer to enter a low-power standby. This allows you to quickly power down without closing applications and to quickly return to the same operational state without any data loss.

To change the power button's configuration, complete the following steps:

1. Access the Computer Setup Utilities menu.
2. Select Power, then Energy Saver Options. Set the power button configuration to either on/off or suspend/wakeup, as desired.

   For more information about the various screen and configuration options, refer to the "Using Computer Setup Utilities" section of this chapter.
3. Select File → Save Changes and Exit.

After configuring the power button to function as a suspend button, press the power button to put the system in a very low power state (suspend). Press the button again to quickly bring the system out of suspend to full power status. To completely turn off all power to the system, press and hold the power button for four seconds.

✎ If you have selected the "Blink LED during Energy Save" option in Computer Setup, the power-on light will blink once every two seconds while the computer is in suspend. Refer to the "Using Computer Setup Utilities" section of this chapter for more information.

2.11.6 Power Management

Use the Timeouts option under the Power menu in Computer Setup to enable, customize, or disable standby timeouts. This feature shuts down certain components of the computer when they are not in use, saving energy without having to shut down the computer.

✎ When using Windows 95 or Windows 98, disable monitor timeouts in Computer Setup first, then establish the settings in Windows, 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.

2.11.7 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
- A version of Microsoft Windows or Microsoft Windows NT Workstation 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*. 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 98, 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 at 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 information.

- 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.

✎ If you call Compaq to place an order, be sure to have the serial number of the computer available. This number is necessary for all purchases.

2.11.8 Compaq Integrated Software

Additional support software is available on *the Support Software CD* and may be downloaded from the Compaq World Wide Web site at www.compaq.com. This software supplements the installation of off-the-shelf Microsoft operating systems and lets you quickly and easily install the correct device drivers and other software required for top performance.

2.11.9 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 Computer products. The UDM eases graphics driver deployment across all Compaq 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* and may be downloaded from the Compaq World Wide Web site at www.compaq.com.

2.12 Building Blocks and Partners

Compaq management solutions are based on industry standards, including DMI 2.0, Web-Based Enterprise Management, Intel's "Wired for Management," SNMP, and Net PC technologies. Microsoft, Intel, Hewlett-Packard, Novell, Seagate, and other industry leaders work closely with Compaq to integrate their management solutions with Compaq products and initiatives, giving you, the Compaq customer, extraordinary flexibility and functionality in client management and PC ownership cost reduction.

2.12.1 Desktop Management Interface (DMI)

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*.

2.12.2 Compaq Insight Manager and the Insight Management Agents

Using the industry-standard Simple Network Management Protocol (SNMP) found in Microsoft operating systems, 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 Personal Computers.

2.12.3 Compaq Management Solutions Partners Program

Compaq delivers desktop management solutions through the Compaq Management Solutions Partners Program. This Compaq initiative ensures compatibility and integration of AssetControl features with leading PC LAN and enterprise management products. These products provide remote access to the AssetControl features so that LAN and PC administrators can manage the Compaq 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 computers more confidently and cost effectively.

Compaq Management Solutions Partners include:

- Asset Software International (ASI) Corp.
- BindView Development
- Cheyenne Software Inc.
- Computer Associates
- Hewlett Packard
- Intel Corporation
- Network Associates (formerly McAfee Associates Inc.)
- Microsoft Corporation
- Novell Inc.
- Seagate Technology, Inc.
- Tally Systems Corp.
- Tivoli Systems, Inc.

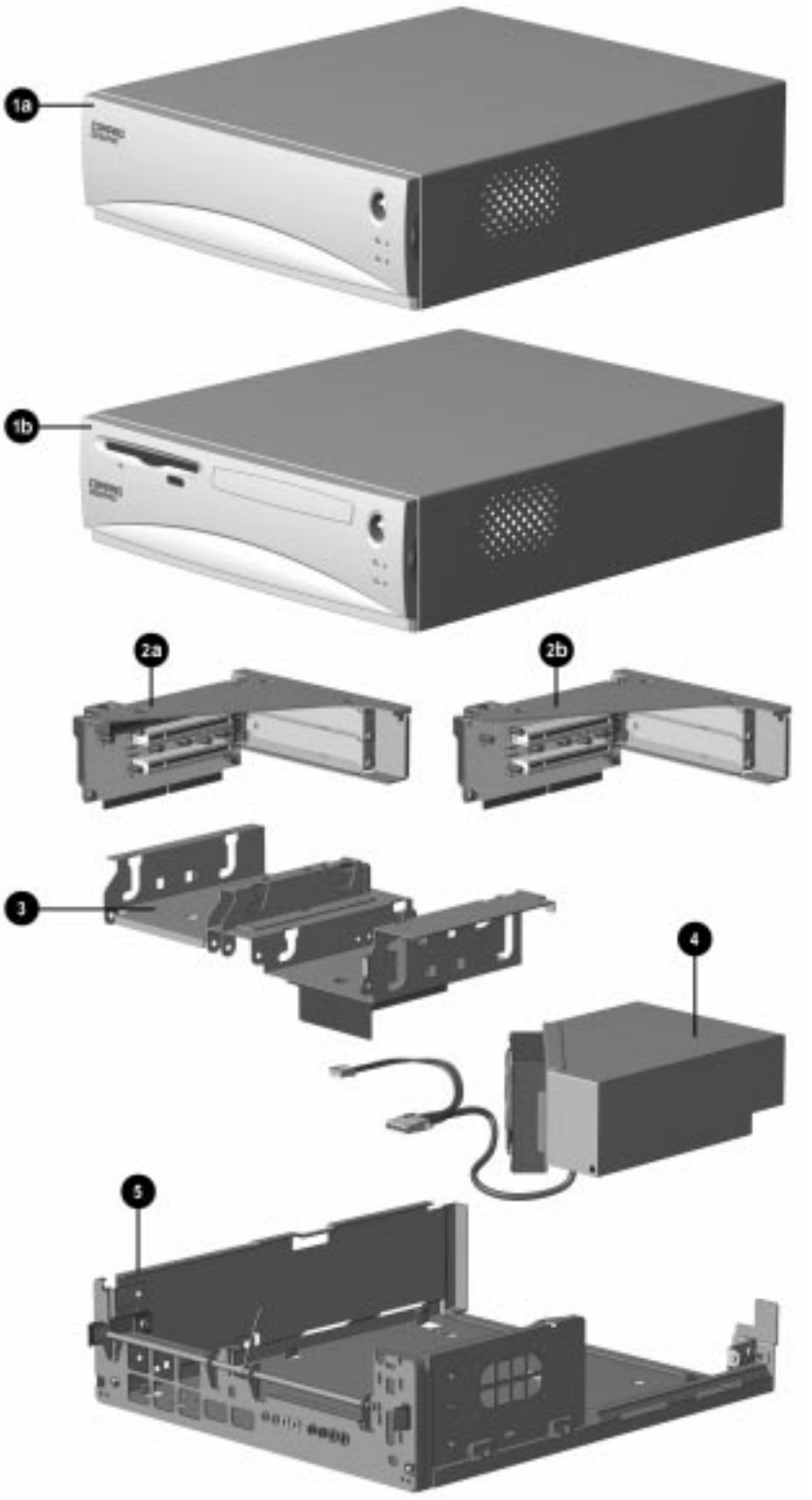
chapter 3

ILLUSTRATED PARTS CATALOG

This chapter provides an illustrated parts breakdown and a reference for spare parts for the Small Form Factor and Net PC models.

Net PC and Small Form Factor Models

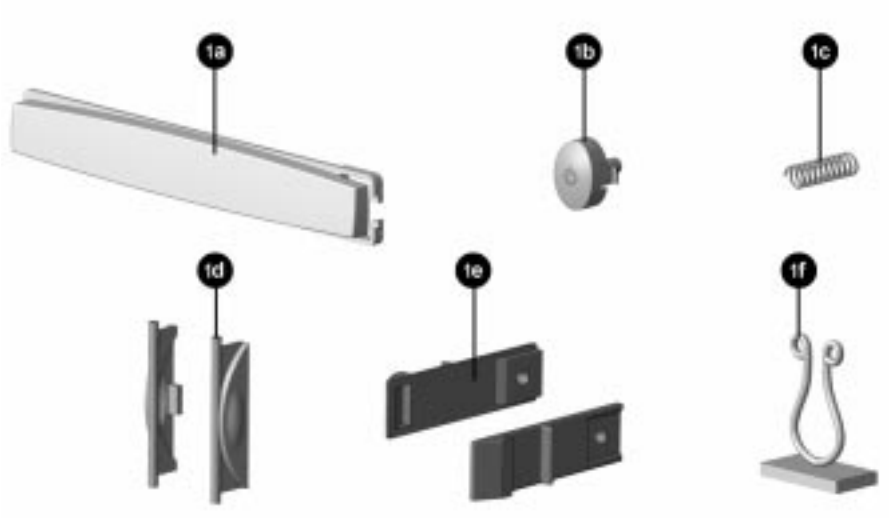
3.1 System Unit



System Unit

	Description	Spare Part Number	Warranty Tier
	Hood assembly		
1a	Net PC Model Includes hood cover, power button, LED light pipe, front bezel, and screws.	314217-001	A
1b	Small Form Factor Model Includes hood cover, power button, LED light pipe, front bezel, CD-ROM blank bezel, and screws.	314216-001	A
	Expansion Board Cage		
2a	Small Form Factor Model Includes riser card with expansion bracket assembly, two slot covers and screws.	314207-001	A
2b	Net PC Model Includes riser card with expansion bracket assembly, two slot covers and screws.	314208-001	A
3	Drive cage	314220-001	A
4	Power Supply	288472-001	A
5	Chassis assembly includes hinge bar, hinge bar retaining screw, drive cage spring, cover release latch, and power supply hinge bracket with mounting screws (**repair/exchange only**)	314221-001	D

3.2 Miscellaneous Plastics Kit



Description	Spare Part Number	Warranty Tier
Miscellaneous Plastics Kit, includes	314219-001	A

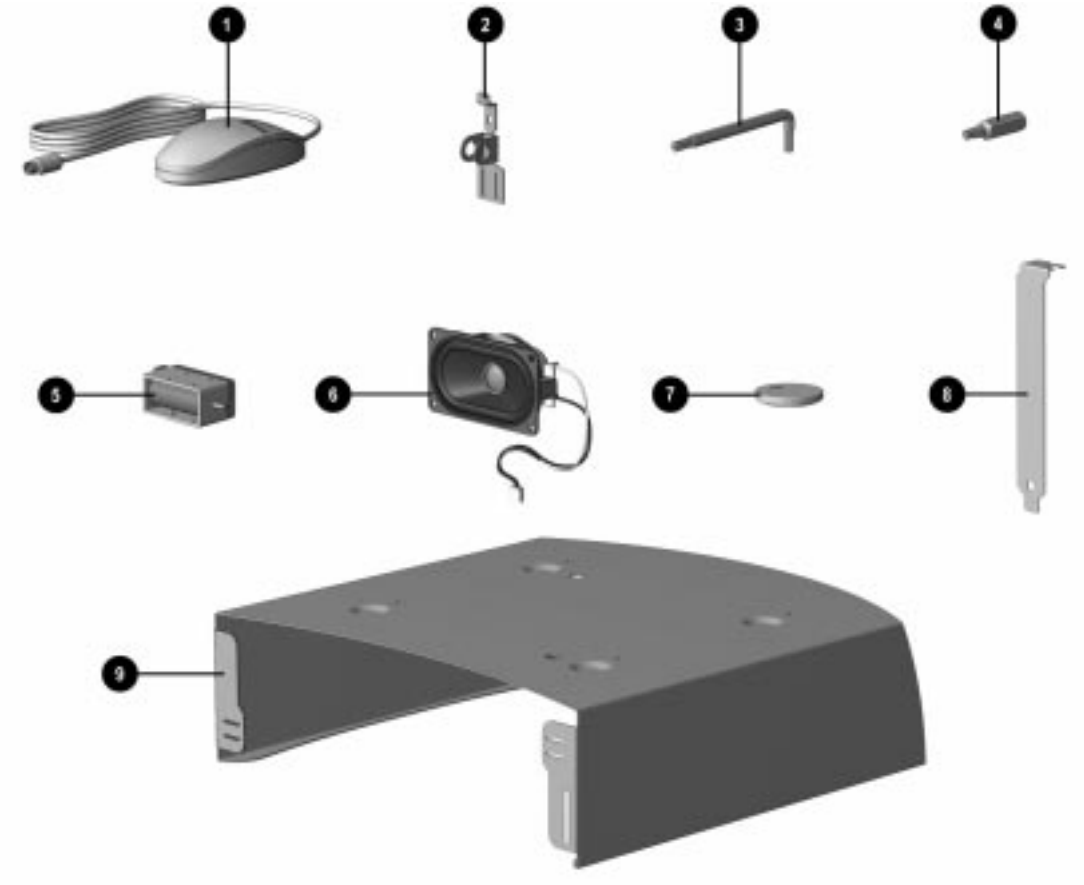
1a Bezel blank (Small Form Factor only)
1b Power switch button
1c Power switch button spring
1d Hood release latch buttons (2 each)
1e Hood latch (2 each)
1f Cable clip (2 each)

3.3 Miscellaneous Hardware Kit

Description	Spare Part Number	Warranty Tier
Miscellaneous Hardware Kit, includes	288437-001	A

1a Screw, #6-32 × 3/16 wafer head (5 each)
* Screw, #6-32 × 1/4 high top with serrations (5 each)
* Screw, #6-19 × 3/8 plastite, thread forming (5 each)
* Screw, M2.5 × 0.45 wafer head (5 each)
1e Screw, M2.5 × 0.45 high top (5 each)
1f Screw, #4-40 × 5/16 slide latch (5 each)
1g Feet (4 each)
1h Power supply pivot bracket (2 each)
1i Solenoid bracket
* Speaker Nuts (5 each)

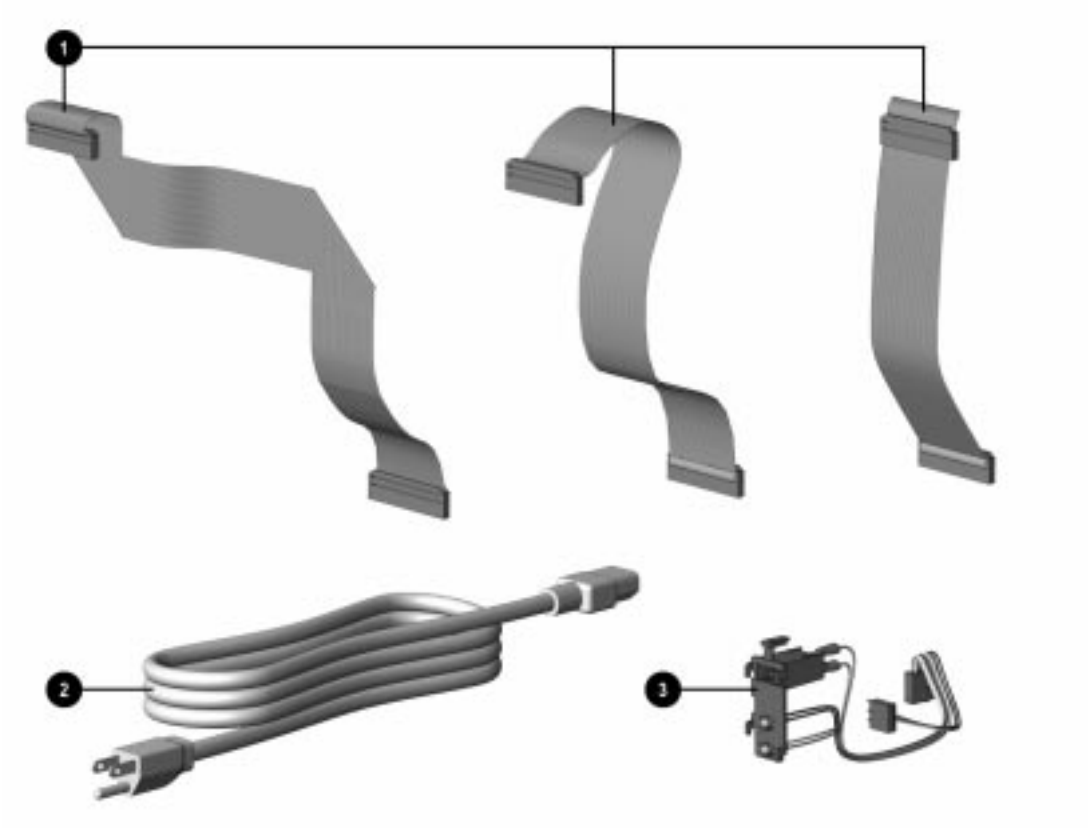
3.4 Miscellaneous Parts



	Description	Spare Part Number	Warranty Tier
1	Two-button mouse	166861-001	A
2	Security lock bracket	199109-001	A
	Smart Cover FailSafe Key includes:		
3	Tamper Resistant T-15 Wrench	166527-001	A
4	Tamper Resistant Bits (5)	166527-002	A
5	Solenoid	179189-001	A
6	Speaker	314227-001	A
7	Battery, real-time clock	129907-001	A
8	Expansion slot cover	141081-001	A
9	Computer mounting bracket	288461-001	A
*	Universal Monitor Stand	294349-001	A
*	Screwdriver with bits	161946-001	A
*	Microphone	278266-002	A

*Not illustrated.

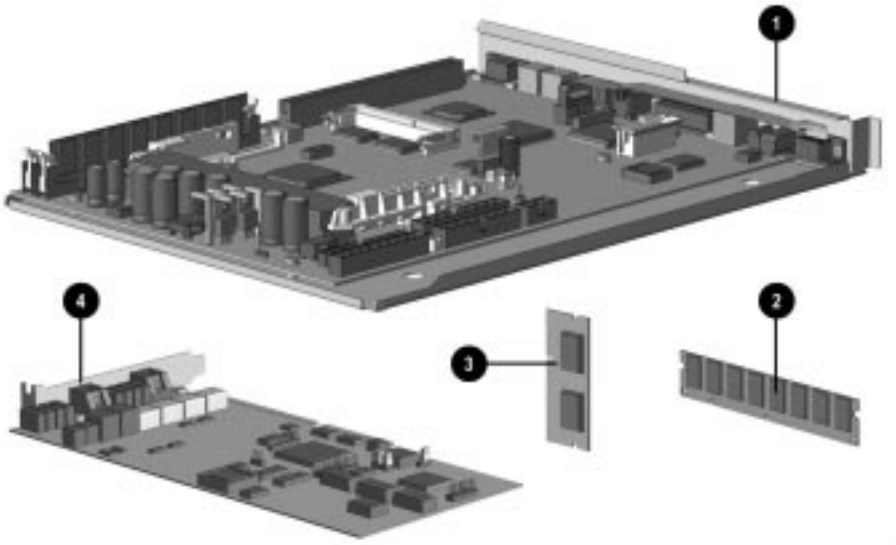
3.5 Cables



	Description	Spare Part Number	Warranty Tier
1	Cables (from left to right) Diskette drive (Small Form Factor only) Slimline CD-ROM drive (Small Form Factor only) Hard drive	314215-001	A
2	Power cord, AC		
	U.S., Canada	142766-001	A
*	U.K.	121259-001	A
*	Germany, France, Netherlands	285810-001	A
*	Australia, New Zealand	238472-005	A
*	Italy	292657-061	A
*	Denmark	292657-081	A
*	Japan	292657-191	A
*	Sweden	292657-111	A
*	China	292657-AA1	A
3	Power Switch Cable Assembly (2), includes power cable with LEDs, power switch, and switch holder.	314218-001	A

*Not illustrated.

3.6 Standard and Optional Boards



	Description	Spare Part Number	Warranty Tier
1	System Board	314213-001	A
*	Intel Pentium II Microprocessor with MMX technology		
	300/66 MHz	314222-001	A
	333/66 MHz	314223-001	A
	350/100 MHz	314224-001	A
	400/100 MHz	314225-001	A
2	DIMM, 100 MHz non-ECC SDRAM, standard		
	16 MB	166969-001	A
	32 MB	166890-001	A
	64 MB	179190-001	A
	128 MB	166966-001	A
*	DIMM, 100 MHz, ECC SDRAM, optional		
*	16 MB	166964-001	A
*	32 MB	166968-001	A
*	64 MB	166967-001	A
*	128 MB	166965-001	A
3	Video Memory, 4 MB	166972-001	A
4	NIC Cards		
	10/100 PCI NIC	179167-001	A
	10/100 PCI NIC W/TX	169849-001	A
	Token Ring NIC, 4/16	179294-001	A
*	Modem, 33.6/56 K Baud (Small Form Factor only)	294912-001	

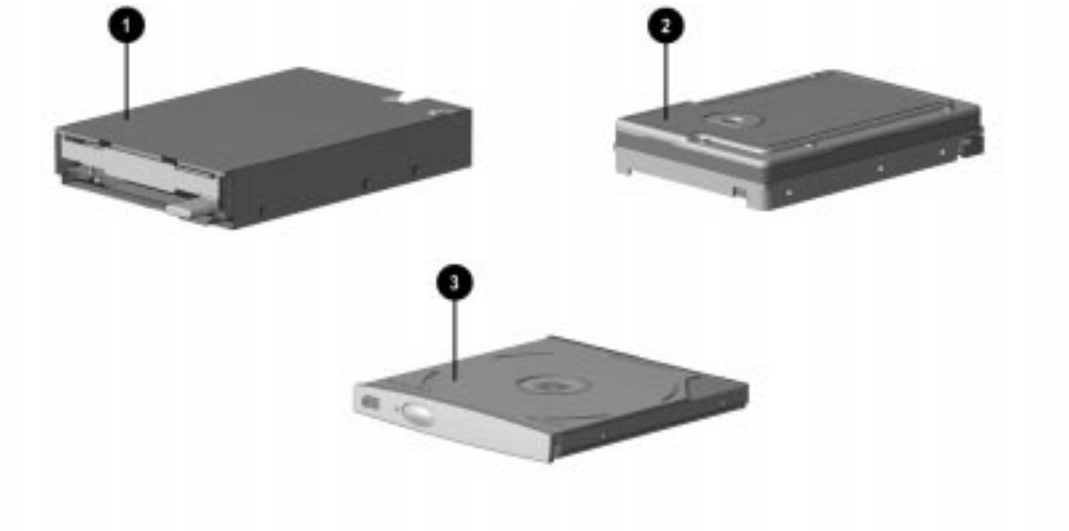
*Not illustrated.

3.7 Keyboards

	Description	Spare Part Number	Warranty Tier
	U.S.	269513-001	A
*	Arabic	269513-171	A
*	Belgian	269513-181	A
*	Bosnia-Herzegovina, Croatia, Slovenia, and Yugoslavia	269513-B41	A
*	Brazilian Portuguese	269513-201	A
*	Czech	269513-221	A
*	Danish	269513-081	A
*	Finnish	269513-351	A
*	French	269513-051	A
*	French Canadian	269513-121	A
*	German	269513-041	A
*	Greek	269513-151	A
*	Hungarian	269513-211	A
*	International	269513-B31	A
*	Kanji (Japanese)	269513-191	A
*	Italian	269513-061	A
*	Hanguel (Korean)	269513-AD1	A
*	Latin American Spanish	269513-161	A
*	Norwegian	269513-091	A
*	Polish	269513-241	A
*	Portuguese	269513-131	A
*	Russian	269513-251	A
*	Slovakian	269513-231	A
*	Spanish	269513-071	A
*	Swedish	269513-101	A
*	Swiss	269513-111	A
*	Taiwanese	269513-AB1	A
*	Thai	269513-281	A
*	Turkish	269513-141	A
*	U.K.	269513-031	A

*Not illustrated

3.8 Mass Storage Devices



	Description	Spare Part Number	Warranty Tier
1	3.5-inch, 1.44-MB Diskette Drive with mounting screws (Small Form Factor only)	314236-001	A
2	3.2-GB Ultra ATA Hard Drive	166873-001	A
*	6.4-GB Ultra ATA Hard Drive	166973-001	A
3	24X Max IDE Slimline CD-ROM Drive with mounting screws(Small Form Factor only)	314214-001	A
*	2.1-GB IDE Hard Drive	288449-001	A

*Not illustrated.

3.9 Shipping Boxes

Description	Spare Part Number	Warranty Tier
PC Return kit (shipping box with packing)		
U.S. only	288433-001	A
International	314273-002	A

3.10 Documentation and Software

Description	Spare Part Number	Warranty Tier
Documentation (Small Form Factor and Net PC Models)		
Maintenance & Service Guide	314271-001	A
Illustrated Parts Map	314272-002	A
Software		
Compaq Restore CD	339914-002	A

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.

CAUTION: When the computer is plugged into an AC power source there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

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

The following table shows that:

1. different activities generate different amounts of static electricity.
2. static electricity increases as humidity decreases.

	Relative Humidity		
Event	**55%**	**40%**	**10%**
Walking across carpet	7,500 V	15,000 V	35,000 V
Walking across vinyl floor	3,000 V	5,000 V	12,000 V
Motions of bench worker	400 V	800 V	6,000 V
Removing DIPs* from plastic tube	400 V	700 V	2,000 V
Removing DIPs* from vinyl tray	2,000 V	4,000 V	11,500 V
Removing DIPs* from Styrofoam	3,500 V	5,000 V	14,500 V
Removing bubble pack from PCB	7,000 V	20,000 V	26,500 V
Packing PCBs in foam-lined box	5,000 V	11,000 V	21,000 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 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 and 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 +/- 10% resistance between the operator and ground.

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 Recommended Materials and Equipment

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 +/- 10% 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 it 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 Power Supply Fan

The power supply fan is a variable-speed fan based on the temperature in the power supply.

CAUTION: The cooling fan is off **only** when the computer is turned off or the power cable has been disconnected.

The cooling fan is always on in all other instances (when the computer is either "On," or in "Standby" or "Suspend" mode).

You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

4.3.2 Tools and Software Requirements

To service the computer, you need the following:

- Torx T-15 screwdriver (Compaq screwdriver with bits P/N 161946-001)
- Flat-bladed screwdriver
- Diagnostics software
- Compaq tamper-resistant T-15 wrench (Smart Cover FailSafe Key, P/N 166527-001)
- Compaq tamper-resistant bits (Smart Cover FailSafe Key, P/N 166527-002)

4.3.3 Screws

The screws used in the computer are not interchangeable. They may have standard or metric threads and may be of different lengths. 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.

4.3.4 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.

4.3.5 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.

4.3.6 Lithium Coin Cell Battery

The battery that comes with your computer provides power to the real-time clock and has a lifetime of about five years. When replacing the battery, use a CR2032 or equivalent 3-volt lithium coin cell battery.

See Chapter 5, “Removal and Replacement Procedures,” for instructions on the replacement procedures.

WARNING: This computer contains a lithium-ion battery pack. There is a risk of fire and chemical burn if the battery pack is handled improperly. Do not disassemble, crush, puncture, short external contacts, dispose in water or fire, or expose it to temperatures higher than 60ºC (140ºF).

chapter 5

REMOVAL & REPLACEMENT PROCEDURES

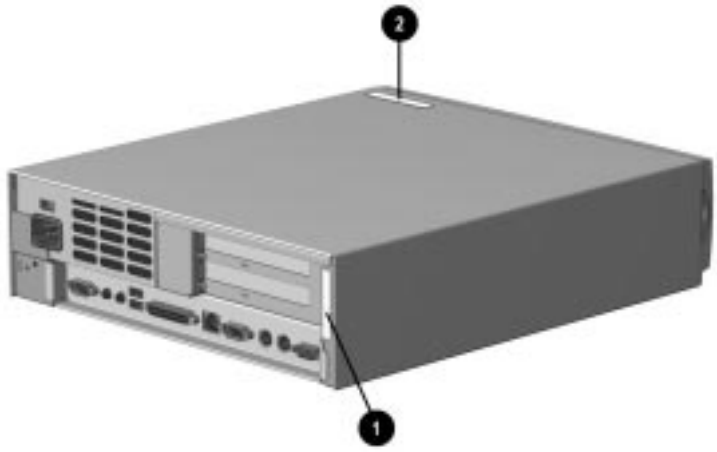
This chapter provides subassembly/module level removal and replacement procedures for the Small Form Factor and Net PC models. All steps described in this chapter may not apply to all models as there are some physical differences between the Small Form Factor and Net PC models.

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

CAUTION: When the computer is plugged into an AC power source, there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

5.1 Serial Number

Provide the computer serial number to Compaq when requesting information or ordering spare parts. The serial number is displayed on the top of the system unit cover at the right front corner and also on the rear of the computer.



Serial Number Location

5.2 Installing the Personal Computer

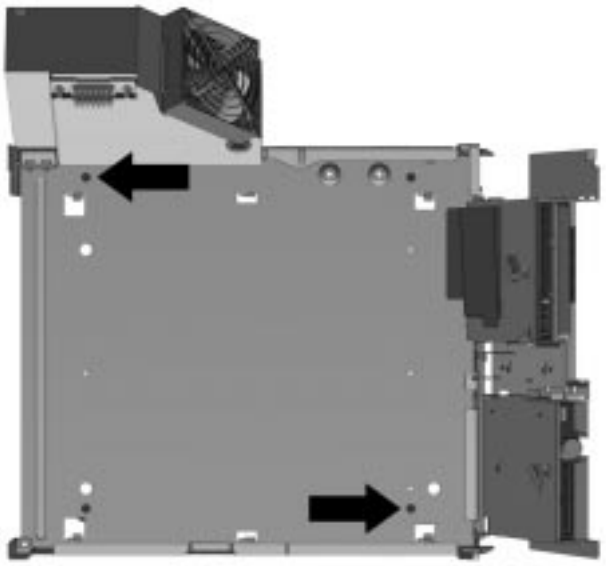
There are three different methods of mounting the computer in a work area: self-mounting, mounting bracket, and the drawer install method.

5.2.1 Self-Mounting Method

CAUTION: The computer power switch should be turned off before you disconnect any cables.

To mount the computer directly to a work area, complete the following steps:

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the expansion board cage (Section 5.9).
4. Disconnect the flat ribbon cables from the clip on the back of the drive cage and free the power cables from the cable tie on the right side of the chassis.
5. Disconnect the cables from the system board.
6. Remove all drives (Section 5.7).
7. Rotate the Easy Access Power Supply (Section 5.11) to an upright position.
8. Press the side of the chassis to release latch, then tilt the Ease Access Drive Cage to an upright position.
9. Slide out the system board tray (Section 5.12).



Chassis Mounting Screw Holes

10. Use a screwdriver to punch out the center portion of the rubber feet that are covering the screw holes in the base of the chassis.
11. Position the computer in the desired area and mark through the mounting holes to accurately locate where the fasteners will be installed.

12. Move the computer; then drill pilot holes in the mounting surface if required to accept the fasteners.

CAUTION: Do not drill any holes through the computer chassis. Use the existing holes in the chassis to lay out the location of the desired holes.

13. Reposition the computer and install the fasteners through the computer chassis.

CAUTION: Use only #6 FH screws to mount the computer. A larger screw may damage or interfere with the system board tray.

CAUTION: Carefully clean the cavity of the chassis to remove any foreign particles before reinstalling the computer components.

14. Reinstall the balance of the computer components and the system unit cover.

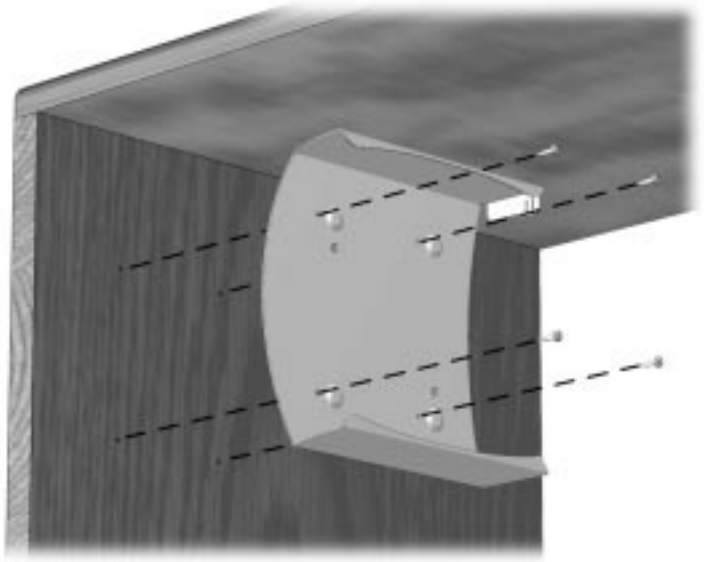
5.2.2 Mounting Bracket Method

CAUTION: Do not mount the computer upside down when using this method.

To install the optional mounting bracket, complete the following steps:

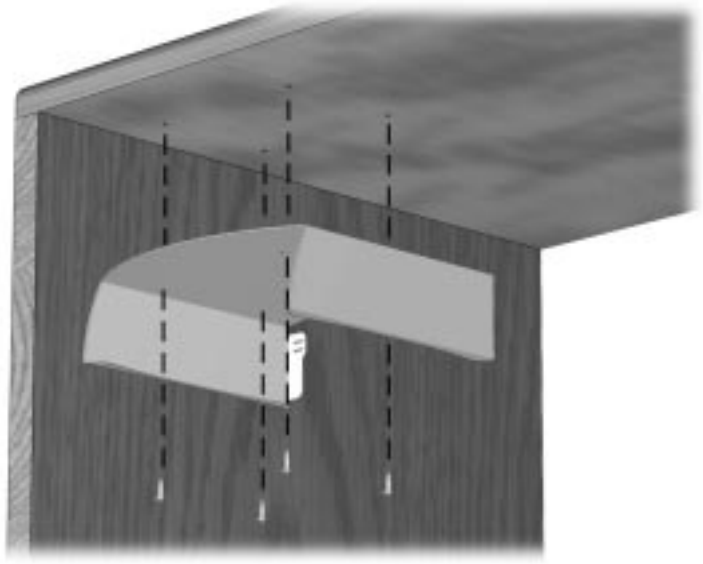
1. Position the mounting bracket in the desired area and mark through the mounting holes to accurately locate where the fasteners will be installed.
2. Drill pilot holes in the mounting surface if required to accept the fasteners.
3. Install the fasteners through the mounting bracket.

CAUTION: Make sure you use the proper fasteners to suit the material to which the mounting bracket will be installed. Failure to select the proper fasteners may result in damage to the computer.



Installing the Mounting Bracket in a Vertical Mode

Vertical Mounting Method



Installing the Mounting Bracket in a Horizontal Mode

Horizontal Mounting Method

The computer may now be inserted into the mounting bracket.

The cable lock provision may be used with this option. Refer to Section 5.6 for more information.

For more information, refer to the document supplied with the option kit.

5.2.3 Drawer Installation Method

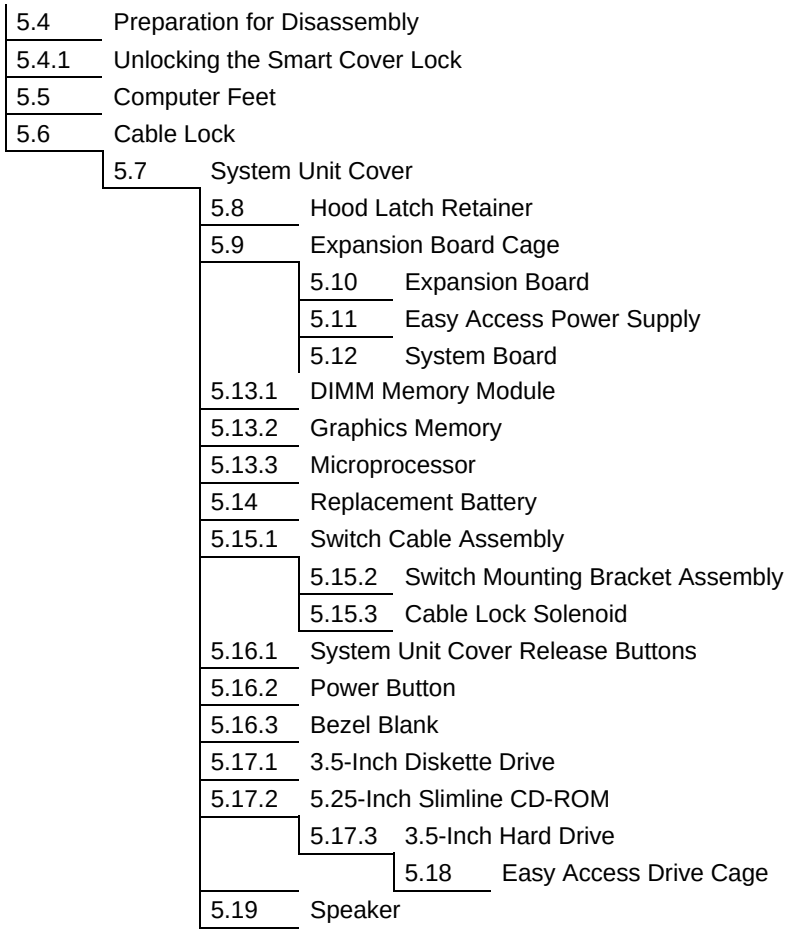
When installing a Small Form Factor or Net PC chassis into a drawer, the following conditions must be met to ensure proper air flow:

1. There must be at least 3-inches (7.6-cm) of clear space between the back of the drawer and anything behind it such as a wall or the back panel of a desk.
2. There must be at least two 2-inch (5.1-cm) diameter holes in the back of the drawer. One hole must be immediately behind the power supply for exhaust air and the other should be used for routing the cables.

CAUTION: Cable should not be run through the exhaust air hole.

3. There must be at least nine holes ranging in size from 0.38- to 0.50-inches (1.0- to 1.3-cm) in diameter in the front drawer panel or in the bottom of the drawer in front of the chassis for fresh air intake.
4. There should be at least one inch of clear space below the drawer to ensure proper air flow if there are vent holes in the bottom of the mounting drawer.
5. There should also be at least one inch of clear space above the top of the chassis.

5.3 Disassembly Sequence Chart



5.4 Preparation for Disassembly

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

1. Unlock Smart Cover Lock (Section 5.4.1).
2. Close any open software applications.
3. Exit Windows.
4. Remove any diskette or compact disc from the computer.
5. Turn off the computer and any peripheral devices that are connected to it.

CAUTION: Turn off the computer before disconnecting any cables.

CAUTION: When the computer is plugged into an AC power source there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

CAUTION: The cooling fan is off **only** when the computer is turned off or the power cable has been disconnected.

The cooling fan is always on in all other instances (when the computer is either “On,” in “Standby,” or “Suspend” mode).

You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

6. Disconnect the power cord from the electrical outlet and then from the computer.
7. 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.

5.4.1 Unlocking the Smart Cover Lock

The Smart Cover Lock is a software-controllable cover lock. This lock prevents unauthorized access to the internal components when the Smart Cover Lock and setup password are enabled.

1. If you enabled the Smart Cover Lock, use Computer Setup to unlock it. Proceed to Step 4.
2. If you enabled the Smart Cover Lock and cannot enter your password to disable the lock, you will need a Smart Cover FailSafe Key (Compaq spare P/N 166527-001 or 166527-002) to open the computer cover. You will also need the key in any of the following circumstances:
   - Power outage
   - Startup failure
   - PC component (e.g., processor or power supply) failure
   - Lost password

CAUTION: Turn off the computer before disconnecting any cables.

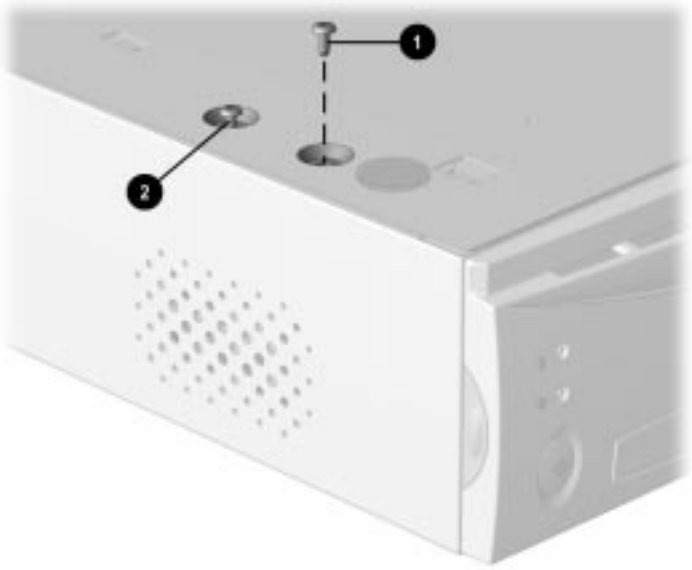
CAUTION: When the computer is plugged into an AC power source there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

CAUTION: The cooling fan is off **only** when the computer is turned off or the power cable has been disconnected.

The cooling fan is always on in all other instances (when the computer is either "On," or in "Standby" or "Suspend" mode).

You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

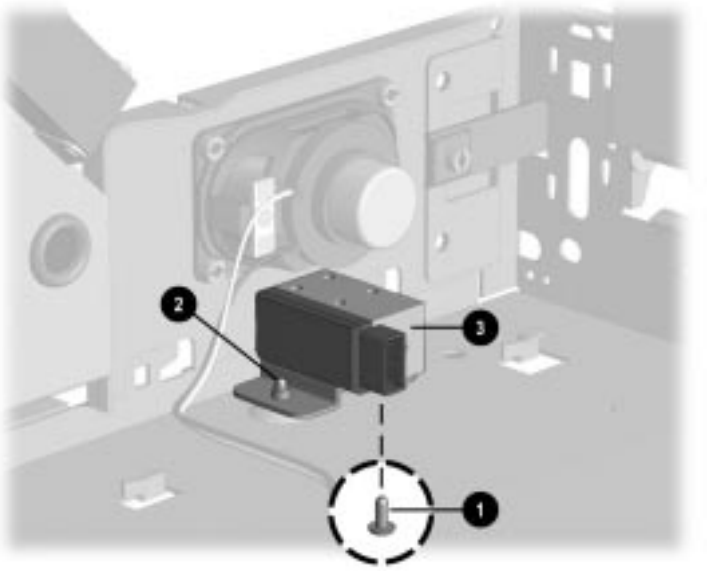
3. Using the Smart Cover FailSafe Key, remove the front tamper-proof screw ❶ located on the bottom right of the computer and loosen the rear screw ❷ securing the Smart Cover Lock to the chassis.



Removing the Smart Cover Lock Screws

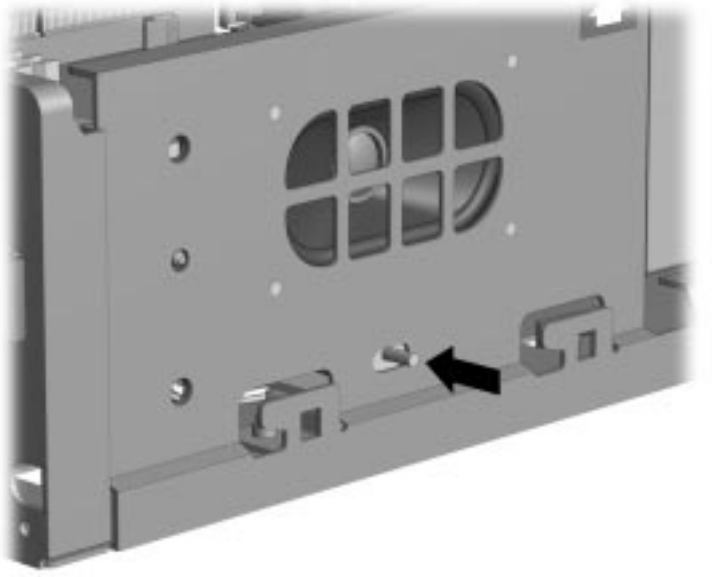
4. Remove the computer cover.
5. To reattach the Smart Cover lock, secure the lock in place with the two tamper-proof screws ❶ and ❷.

   Unlock the solenoid ❸ before replacing the cover.



Reattaching the Smart Cover Lock

6. Press the solenoid pin in (at arrow) to unlock the solenoid.

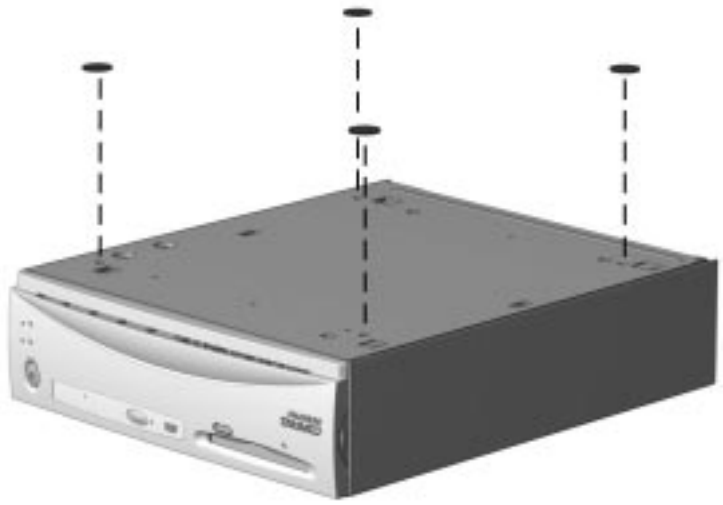


Unlocking the Solenoid

7. Replace the cover.

5.5 Computer Feet

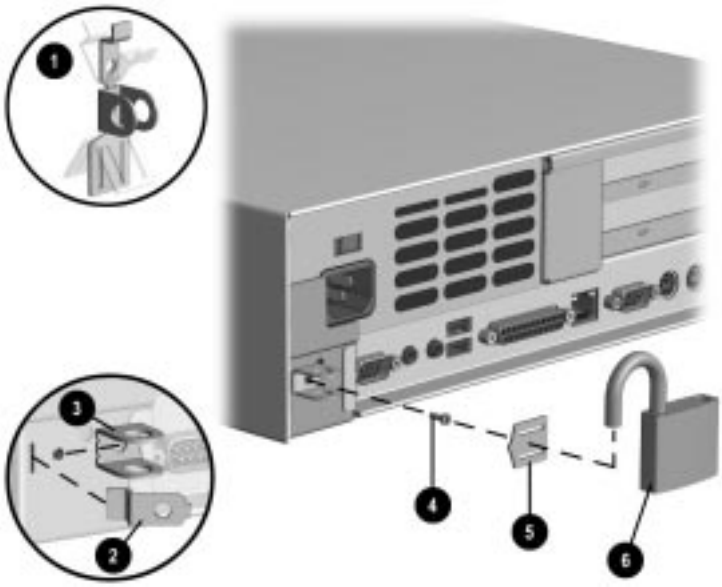
1. Remove the four rubber feet mounted to the underside of the chassis.
2. If necessary, scrape the residue of the old feet from the chassis using a small, flat-bladed screwdriver.
3. Remove the protective strip from the adhesive on the back of the new feet and press them into place.



Installing the Feet

5.6 Cable Lock Installation

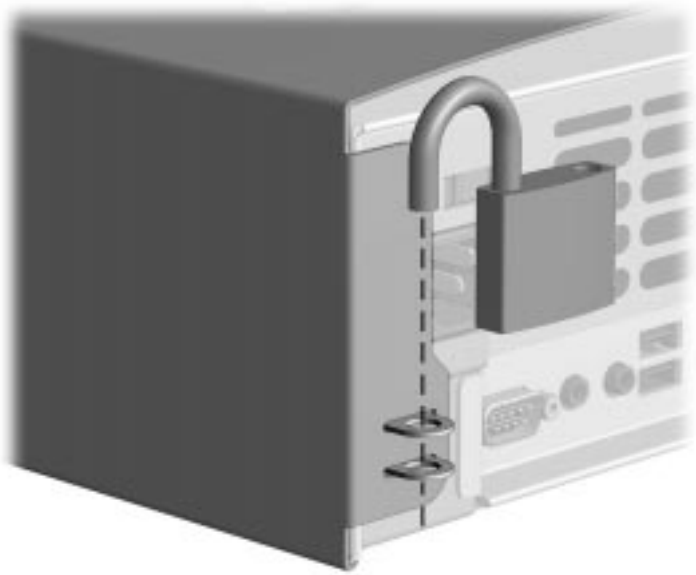
1. Separate the pieces of the security bracket ❶ by bending the metal where the three pieces join.
2. Insert the tang of the narrow bracket ❷ into the slot, and slide the U-shaped bracket ❸ between the narrow bracket and the system unit cover.
3. Secure the bracket with the self-tapping screw ❹ included in the cable lock kit.
4. Cover the screw with the flat portion of the bracket ❺.
5. Install a lock ❻ (not provided) to secure the top part of the security bracket to inhibit access to the inside of the computer. Install a cable lock (not provided) to secure the computer to a fixed object.



Installing the Cable Lock

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

The cable lock provision may be used with the mounting bracket option.



Using the Cable Lock with the Mounting Bracket

5.7 System Unit Cover

1. Prepare the computer for disassembly (Section 5.4).

CAUTION: Turn off the computer before disconnecting any cables.

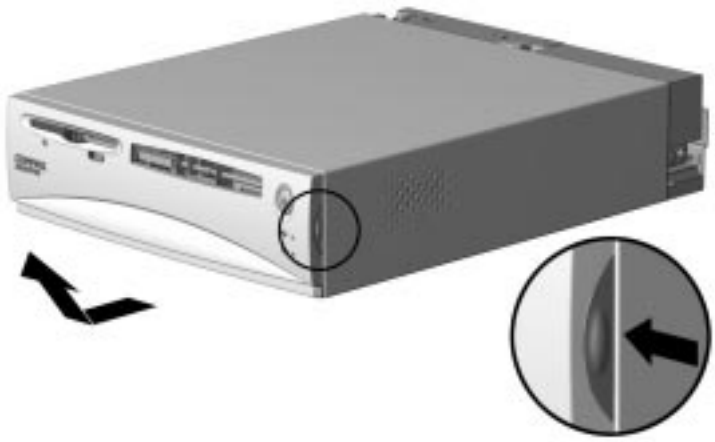
CAUTION: When the computer is plugged into an AC power source there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

CAUTION: The cooling fan is off only when the computer is turned off or the power cable has been disconnected.

The cooling fan is always on in all other instances (when the computer is either "On," or in "Standby" or "Suspend" mode).

You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

1. Press in the quick release cover latch on each side of the front bezel to release the hood latches.
2. Slide the cover forward about 1-inch (2.5-cm); then, lift it up and off the unit.

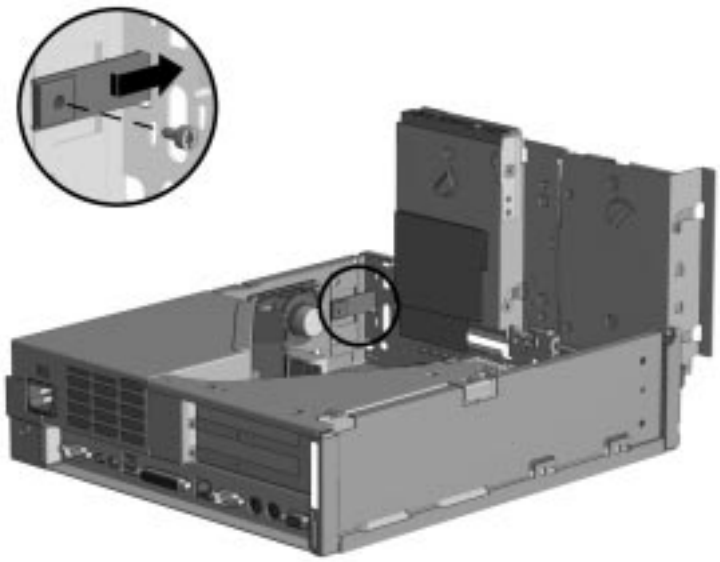


Removing the System Unit Cover

To replace the cover, reverse the removal procedure.

5.8 Hood Latch Retainer

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Press chassis in at the arrow to release the drive cage latch then tilt the Easy Access Drive Cage to an upright position.
4. Remove the retaining screw that secures the hood latch retainer to the side of the chassis, and remove the latch.



Removing the Hood Latch Retainer

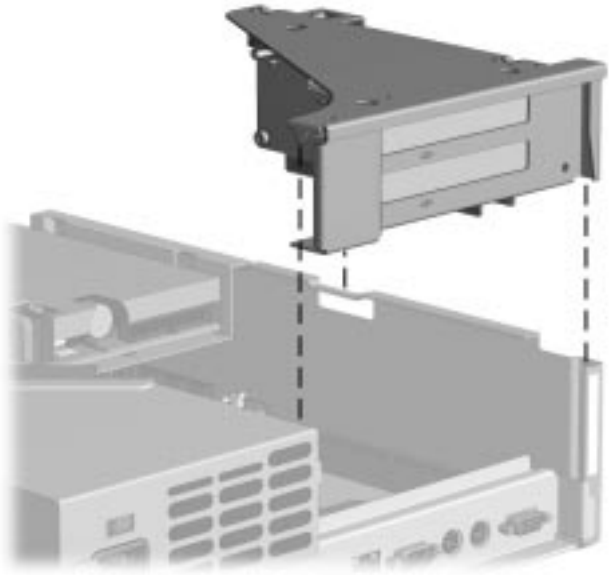
To install the latch retainer, reverse the removal procedure.

CAUTION: Do not overtighten the latch retaining screw. Doing so may not allow the system unit cover to be properly secured.

5.9 Expansion Board Cage

The removable expansion board cage is spared from the factory with the riser card installed.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Pull the expansion board cage straight up to remove it from the chassis.



Removing the Expansion Board Cage

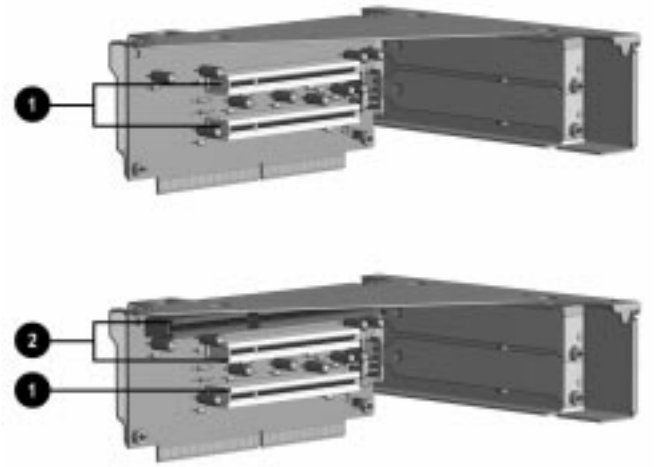
To replace the expansion board cage, reverse the removal procedure.

When installing the expansion board cage, ensure that the riser card is secure in its slot, and ensure that the tab on the cage latches into the slot on the side of the power supply.

5.10 Expansion Board

The Net PC model (top) has two PCI expansion slots ❶.

The Small Form Factor model (bottom) has one PCI ❶ and one PCI/ISA combination slot ❷.



1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the expansion board cage (Section 5.9).
4. Remove the retaining screw that secures the board to the expansion board cage, and remove the expansion board.

Removing the Expansion Board

To replace the expansion board, reverse the removal procedure.

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

The computer should automatically recognize the added plug and play expansion board.

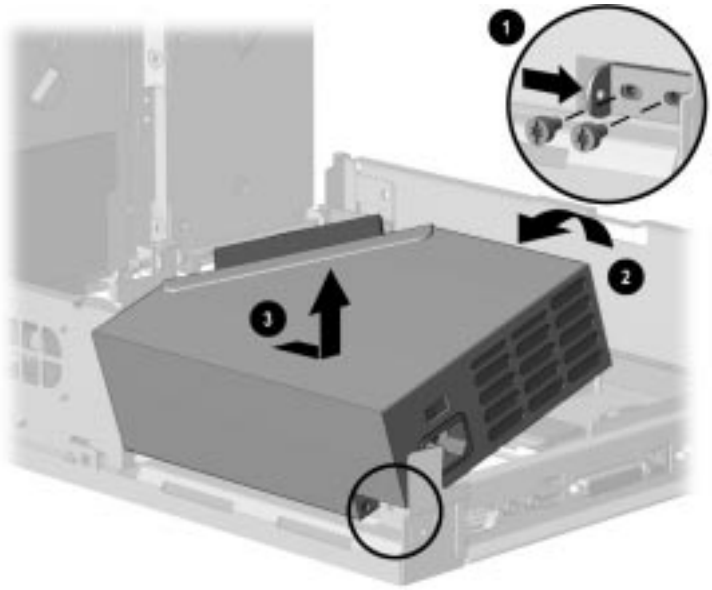
Only 7-inch long expansion boards may be used in these models.

5.11 Easy Access Power Supply

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the expansion board cage (Section 5.9).
4. Loosen the two screws that secure the power supply hinge bracket ❶ to the side of the chassis and slide the bracket to the rear to disengage it from the power supply

   It is not necessary to remove the hinge bracket for this operation.

5. Tilt the power supply up ❷, slide it to the rear ❸, and remove it from the chassis.



Removing the Easy Access Power Supply

To replace the power supply, complete the following steps:

1. Set the power supply down on the system board so that the built-in connector is resting on the socket on the system board.
2. Push the hinge bracket into the hinge hole on the power supply. Hold the bracket in place with one finger while tightening the rear retaining screw.

   Ensure that there is no slack between the power supply, the chassis, and the hinge bracket.

3. Tighten the forward retaining screw to secure the hinge bracket.
4. Press the power supply down so that the built-in connector makes a good electrical connection with the system board.
5. Continue with the balance of the installation sequence, which is the reverse of the installation process described above.

   When installing the expansion board cage, ensure that the tab on the cage latches into the slot on the side of the power supply.

5.12 System Board

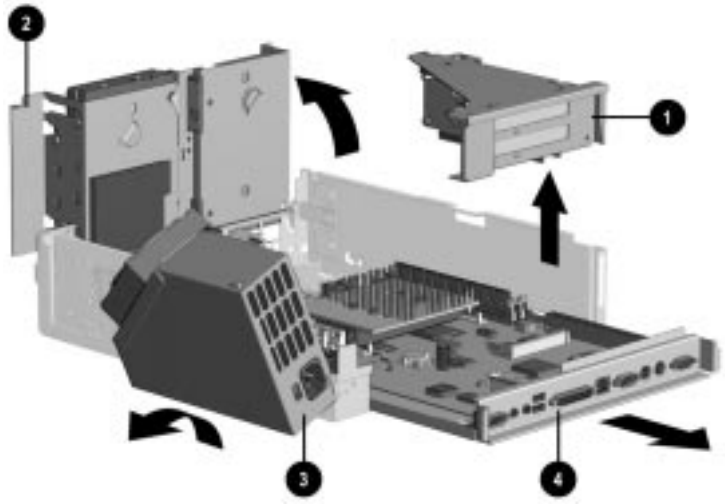
1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the expansion board cage ❶ (Section 5.9).
4. Press the side of the chassis at the arrow to release latch, then tilt the Easy Access Drive Cage ❷ to an upright position.

CAUTION: Check the position of all cables and wires before raising or lowering the drive cage to prevent cable damage.

5. Disconnect all cables from the system board.

The power cord must be removed from the computer before the power supply can be rotated to an upright position.

6. Tilt the power supply ❸, to an upright position.
7. Slide the system board ❹ with the tray out of the chassis.



Removing the System Board

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

5.13 System Board Components

5.13.1 DIMM Memory Modules

Memory may be expanded by adding or replacing up to two DIMMs on 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.

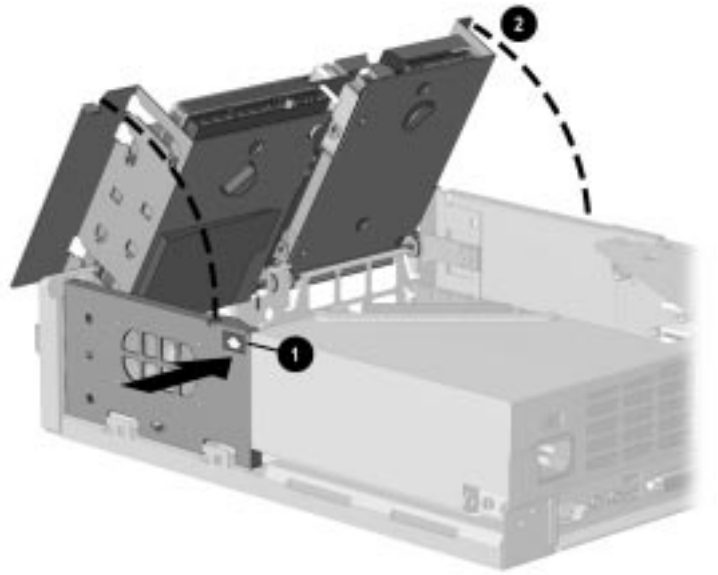
CAUTION: When handling a memory module, be careful not to touch any of the contacts. Doing so can damage the module.

You may use 100-MHz DIMMs in a 66-MHz system but it will operate at 66 MHz.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the expansion board cage (Section 5.9).

   The power cord must be removed from the computer before the power supply can be rotated to an upright position.

4. Press chassis in (at arrow ❶ to release drive cage latch, then tilt the drive cage to an upright position ❷.

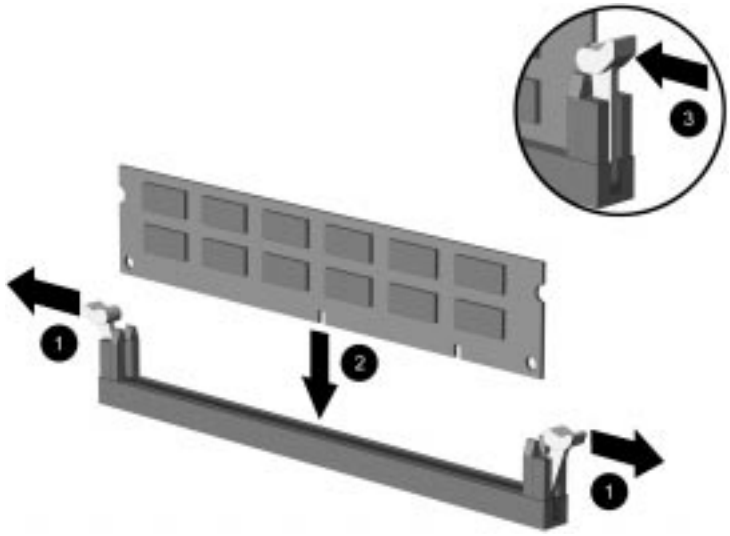


Tilting the Easy Access Drive Bay

5. Slide the system board about 1- to 2-inches (2.5- to 5.1-cm) out of the rear of the chassis.

   It is not necessary to disconnect any cables from the system board for this operation.

6. 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.
7. Lift the module from the socket.



Replacing a Memory Module

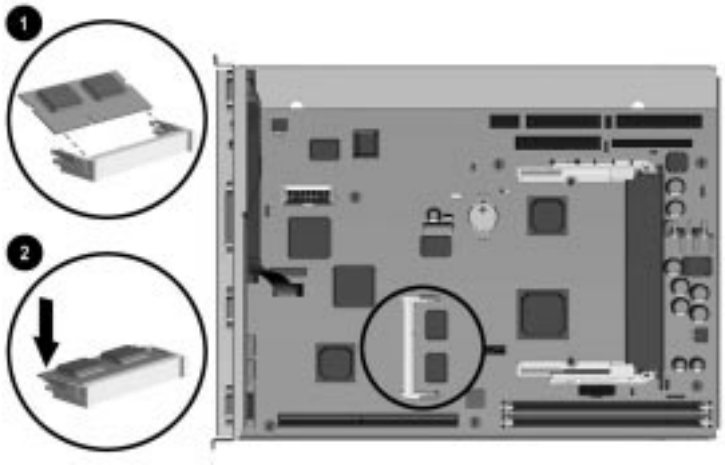
To replace a DIMM, reverse the removal steps.

CAUTION: Check the position of all cables and wires before raising or lowering the drive cage to prevent cable damage.

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

5.13.2 Graphics Memory

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the expansion board cage (Section 5.9).
4. Press chassis in at the arrow to release drive cage latch, then tilt the drive cage to an upright position.
5. Install the memory module so that its notch aligns with the tab in the socket at a 30 degree angle ❶, then tilt the module downward until it latches into position ❷.



Installing an Upgrade Memory Module

6. Replace the computer cover.
7. Change the resolution to take advantage of the additional display modes now available with the upgraded memory. Refer to "Supported Graphics Resolutions," in Chapter 7, "Specifications," for more information.

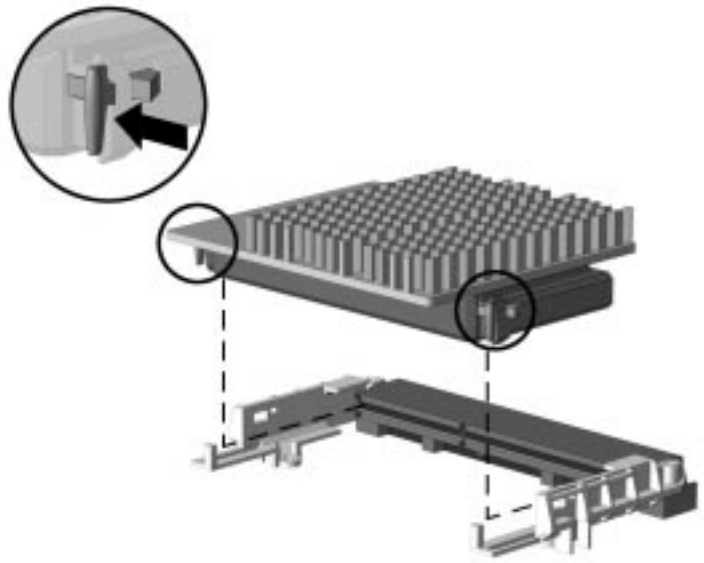
5.13.3 Microprocessor

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).

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

3. Press chassis in at the arrow to release drive cage latch, then tilt the drive cage to an upright position.
4. Press the processor release tabs inward.
5. Remove processor assembly with the attached heat sink by pulling it from the slot edge.

CAUTION: Check the position of all cables and wires before raising or lowering the drive cage to prevent cable damage.



Removing the Microprocessor from the System Board

To replace the processor, press the processor release tabs outward, slide the processor back into its slot until you hear it snap into place.

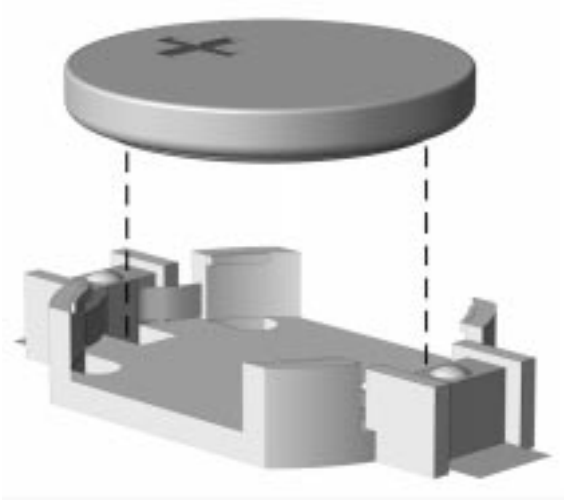
If you change the speed of the processor, refer to the silk screened settings under the fan to change the SW1 processor speed switch settings.

.

5.14 Replacement Battery

The battery that comes with your computer provides power to the real-time clock and has a lifetime of about five years. When replacing the battery, use a CR2032 or equivalent 3-volt lithium coin cell battery. To replace the battery:

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Tilt the drive cage to the upright position.
4. Remove the expansion board cage as required (Section 5.9).
5. Lift the battery out of its holder.



Removing the Coin Cell Battery

6. Slide the replacement battery into position with the "plus" side up.
   The battery holder automatically secures the battery in the proper position.
7. Replace the computer cover.
8. Plug in the computer and turn on power.
9. If you normally lock the Smart Cover Lock, use Computer Setup to relock it.
10. Reset the date and time, your passwords, and any special system setups, using Compaq Computer Setup. Refer to Chapter 2, "Software Reference."

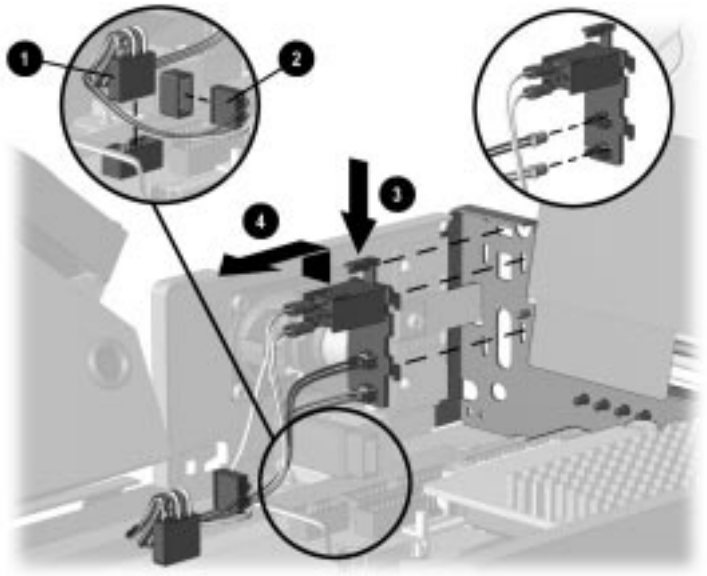
WARNING: This computer contains a lithium-ion battery pack. There is a risk of fire and chemical burn if the battery pack is handled improperly. Do not disassemble, crush, puncture, short external contacts, dispose in water or fire, or expose it to temperatures higher than 60ºC (140ºF).

5.15 Power Switch Cable Components

5.15.1 Switch Cable Assembly

The switch cable assembly consist of two parts: the switch mounting bracket assembly and the switch cable.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Rotate the drive cage to an upright position.
4. Disconnect the switch cable assembly from the system board ❶.
5. Disconnect the cable from the solenoid ❷.
6. Remove the switch mounting bracket assembly from the chassis by squeezing the tab on top of the bracket ❸, then lifting the bracket up and out of the chassis ❹.



Disconnecting the Switch Cable

7. Remove the cable from the cable tie mounted on the side of the chassis.
8. Remove the LED from the power switch bracket by pulling gently on the LED while at the same time prying open the LED retaining ears.

When installing the LED into a new mounting bracket, the black wire should be in the top socket and the white wire in the bottom socket. This is marked on the rear of the mounting bracket.

CAUTION: Compaq does not recommend removing the switch from the mounting bracket.

To install the switch cable assembly, reverse the removal steps.

Refer to the markings on the front of the chassis for proper placement of the LED lights.

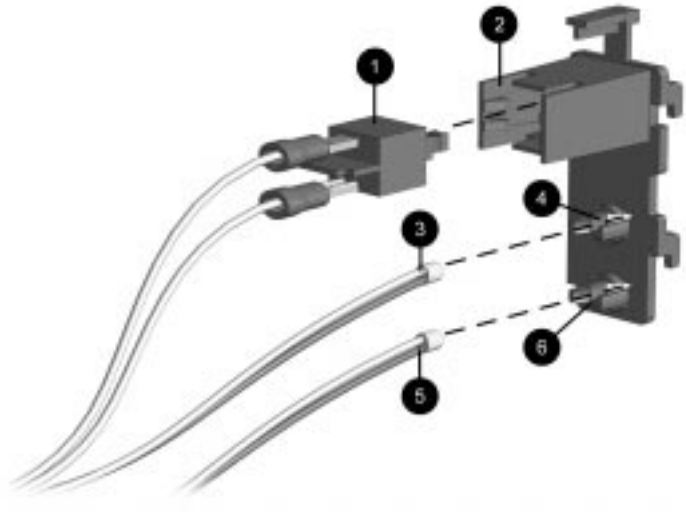
5.15.2 Switch Mounting Bracket Assembly

The switch mounting bracket assembly is comprised of the power switch and the power switch mounting bracket.

The two parts are spared as unassembled components, and must be assembled prior to installation.

CAUTION: Compaq does not recommend removing the switch from the mounting bracket.

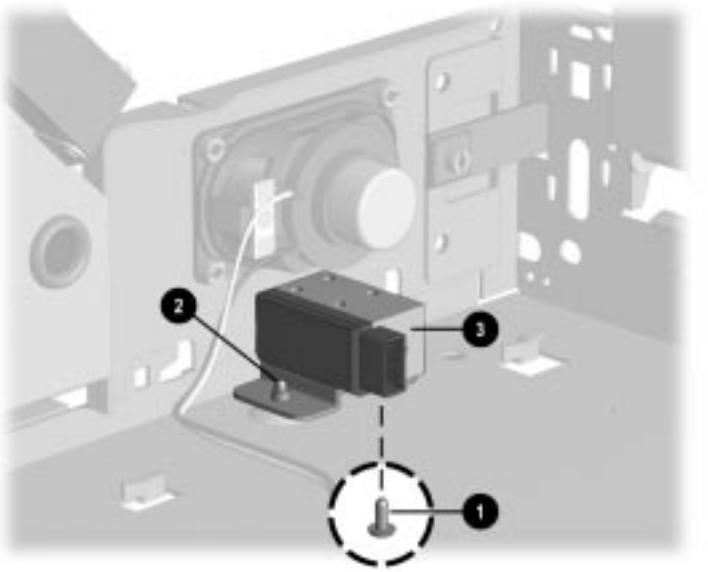
1. Align the switch ❶ with the opening in the back ❷ of the mounting bracket and push the two pieces together. The design of the parts prevents improper installation.
2. Insert the black wired LED ❸ into the upper socket ❹ and the white one ❺ into the lower socket ❻. The wire colors are clearly marked on the rear of the mounting bracket.



Assembling the Switch Mounting Bracket Components

5.15.3 Smart Cover Lock Solenoid

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the switch cable assembly Section 5.15.1).
4. Remove the screws ❶ and ❷ that secure the solenoid ❸ to the chassis. Use the tamper resistant wrench (Compaq Part Number 166527-001) or the special bit (Compaq Part Number 166527-002)
5. Disconnect the solenoid from the power cable.



Removing the Smart Cover Solenoid Lock

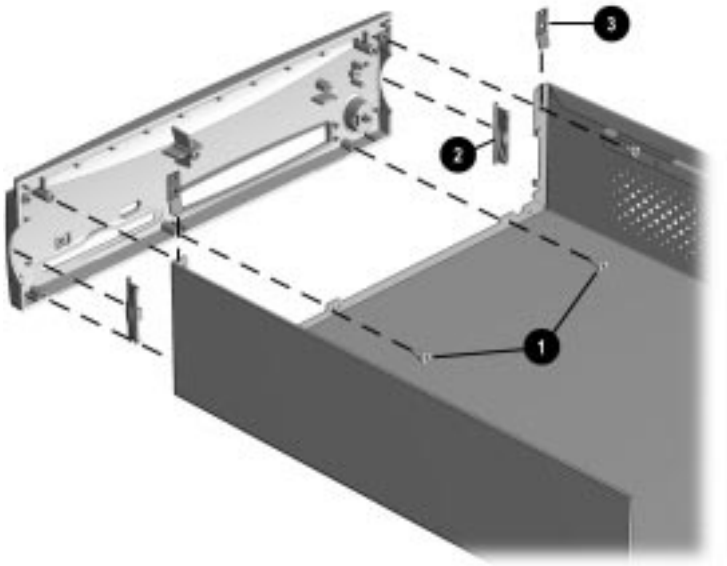
To reinstall the solenoid, reverse the removal procedure.

5.16 System Unit Cover Assembly

The system unit cover assembly consists of the system unit cover, front bezel. quick release cover latches , power button, and CD-ROM bezel blank (Small Form Factor model only. Net PC models do not feature a CD-ROM drive).

5.16.1 Front Bezel and Cover Release Buttons

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7), and place it with the bezel face down onto a protected surface.
3. From the inside of the system unit cover, remove the five screws ❶ that attach the front bezel to the cover.
4. Separate the bezel from the system unit cover. The two quick release cover latches ❷ can be removed at this time.



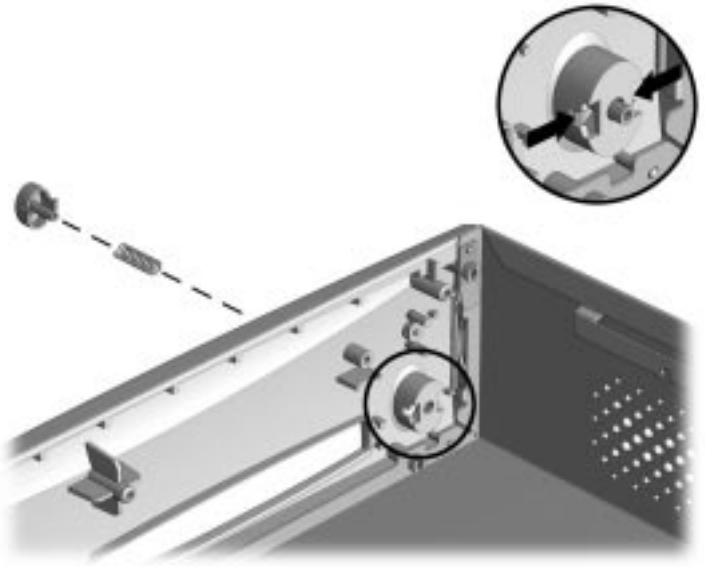
Removing the Front Bezel and Cover Release Buttons (Small Form Factor shown))

To install the quick release cover latches, reverse the removal procedure making sure that the grounding straps ❸ are in place.

5.16.2 Power Button

It is not necessary to remove the front bezel from the system unit cover to remove the power button.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Place the system unit cover assembly top down on a protected work surface. Pinch together the two tabs on the rear of the power button, and push the button out of the front bezel. The spring will follow the button out of the housing.



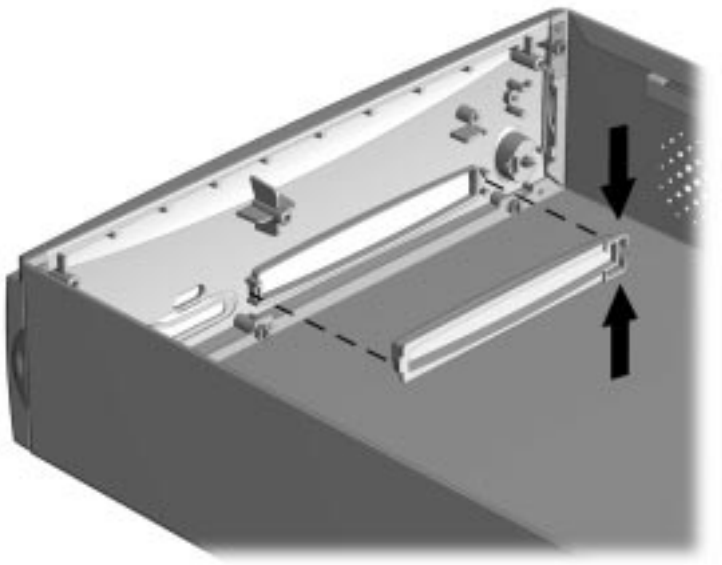
Removing the Power Button (Small Form Factor Shown)

To replace the power button, reverse the removal procedure.

5.16.3 Bezel Blank

This operation applies to the Small Form Factor model only.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Place the system unit cover with the top down on a protected work surface. Squeeze together the sides of the right end of the bezel blank to release the catches.
4. Rotate the bezel blank out of the front bezel.



Removing the Bezel Blank (Small Form Factor Shown)

To reinstall the bezel blank, reverse the removal procedure.

5.17 Mass Storage Devices

The Small Form Factor model computer has two 3.5-inch third-height drive bays. The first drive bay is normally populated by the diskette drive and is located on the left side of the computer. The second 3.5-inch bay is located on the right side of the computer in the bottom position and is used to hold the standard hard drive.

The computer also has a single 5.25-inch drive bay located on the right side of the computer in the upper position and is restricted in use to a Slimline CD-ROM drive.

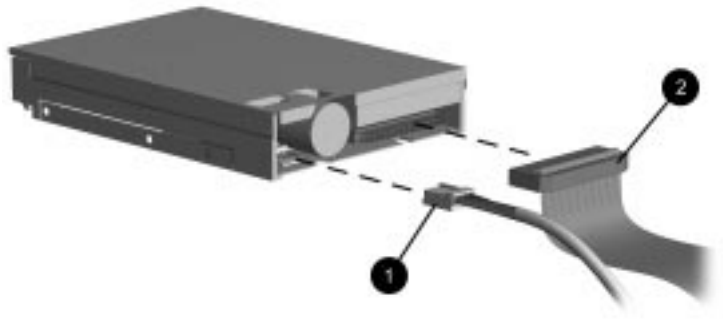
The Net PC model has only a single 3.5-inch third-height drive bay that houses the standard hard drive. No other drives may be installed in this computer.

Refer to Chapter 6, "Connector, Jumper, and Switch Information," for the location of the ribbon cable connections on the system board.

5.17.1 3.5-Inch Diskette Drive

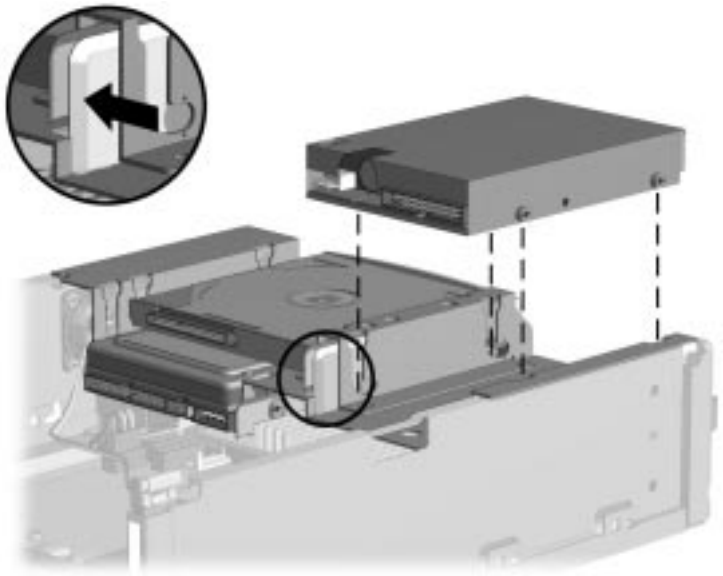
This section applies only to the Small Form Factor model.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Disconnect the power ❶ and data ❷ cables from the back of the drive.



Disconnecting the Power and Data Cables from the 3.5-Inch Diskette Drive

4. Pull the drive release latch on the right side of the drive towards the center of the adjacent drive bays, slide the drive to the rear of the bay, then lift the drive from the bay.



Removing the 3.5-Inch Diskette Drive

When replacing this drive, transfer the four guide screws that take the place of drive rails from the old drive to the new one. There are two guide screws on each side of the drive.

The guide screws mounted on the left side of the drive are standard-head screws. The guide screws mounted on the right side of the drive are wafer-head screws. The drive release latch will not work properly if the wrong screws are installed.

To replace the 3.5-inch drive, reverse the removal 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.

5.17.2 5.25-Inch Slimline CD-ROM Drive

This section applies only to the Small Form Factor Model.

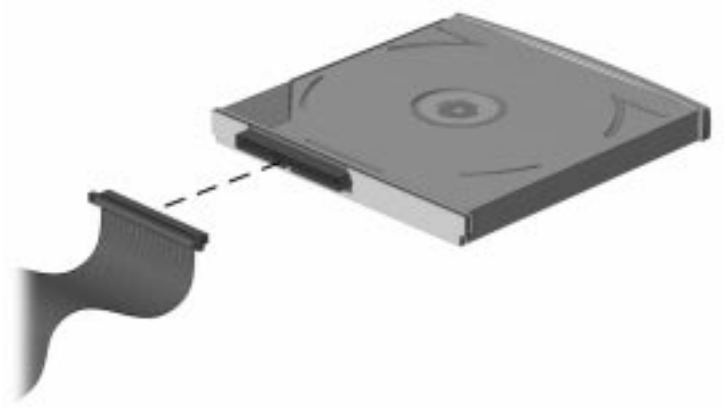
The 5.25-inch drive bay may be occupied by only a Slimline CD-ROM drive.

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

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).

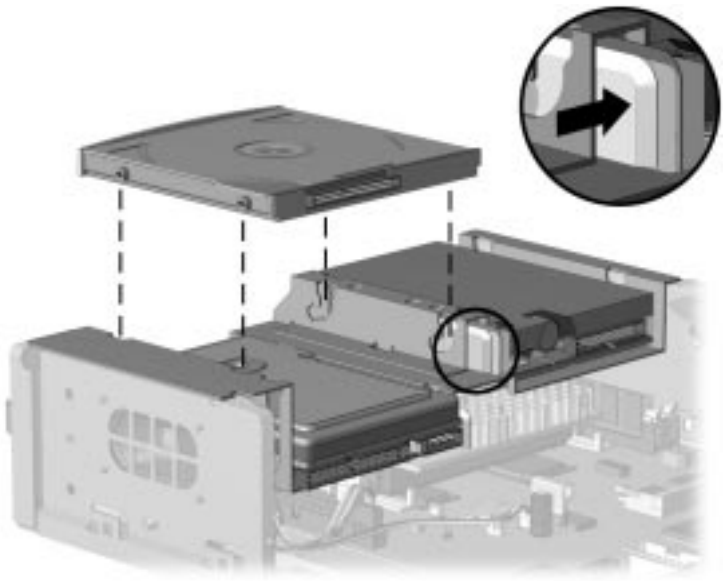
If you are replacing the drive in this bay, continue with step 3. If you are installing a drive for the first time, skip to step 5.

3. Disconnect the CD-ROM flat ribbon cable from the back of the drive.



Disconnecting the CD-ROM Flat Ribbon Cable from the CD-ROM Drive

4. Pull the drive release latch on the left side of the drive toward the center of the adjacent drive bays, slide the drive to the rear of the bay then, then lift the drive from the bay.



Removing the CD-ROM Drive

When replacing this drive, transfer the four wafer-head screws—two on each side of the drive—that take the place of drive rails from the old drive to the new one.

To replace the drive, reverse the removal procedures.

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.

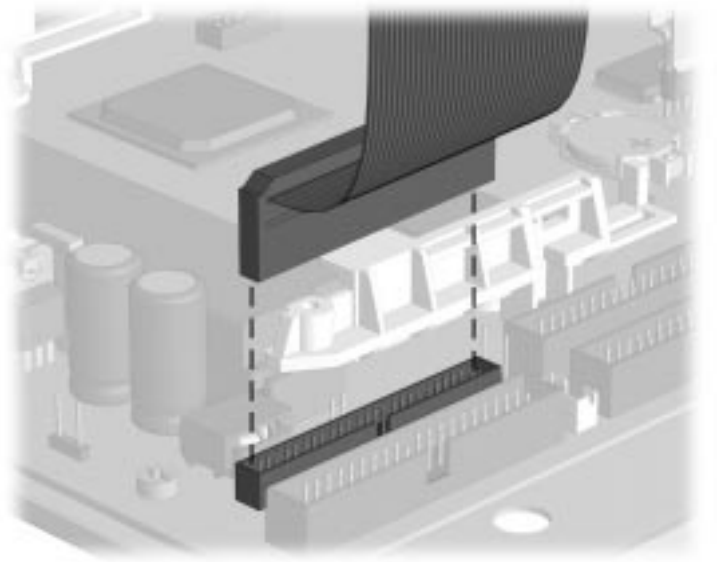
5. If you are installing a new CD-ROM drive for the first time, install two guide screws on each side of the drive.
6. Position the guide screws on the drive into the J-slots in the drive bay, and slide the drive towards the front of the computer. Ensure that the spring-loaded drive release latch properly secures the drive.

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

7. Install the flat ribbon cable onto the back of the drive.

The flat ribbon cable is a multifunction cable that transmits power, audio, and data between the CD-ROM drive and the system board.

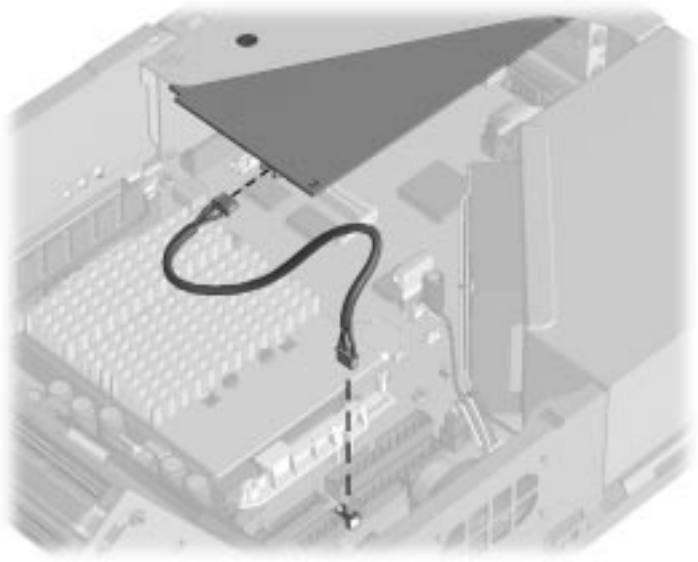
8. If this is a new installation, raise the drive cage to the upright position and connect the flat ribbon cable to the system board.



Connecting the Flat Ribbon CD-ROM Cable to the System Board

CAUTION: Check the position of all cables and wires before raising or lowering the drive cage to prevent cable damage.

9. Return the drive cage to the normal position.
10. If you have installed an audio board to the computer, attach the audio cable from the system board at J11 to the audio board at this time.
11. If it is necessary to remove the expansion board cage to attach the audio cable, refer to Section 5.9.



Attaching the Audio Cable to the System and Audio Boards

12. Remove the bezel blank from the front bezel (Section 5.16.3).
13. Install the system unit cover (Section 5.7).
14. The system will automatically recognize the Slimline CD-ROM drive sold by Compaq, then will automatically reconfigure the computer.

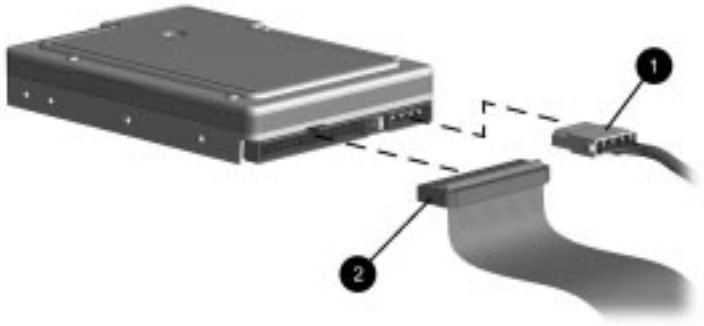
    If you have installed a third-party drive that is not a plug and play device, you must run Computer Setup to reconfigure the computer. Refer to Chapter 2, "Software Reference," for information on running Computer Setup.

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

5.17.3 3.5-Inch Hard Drive

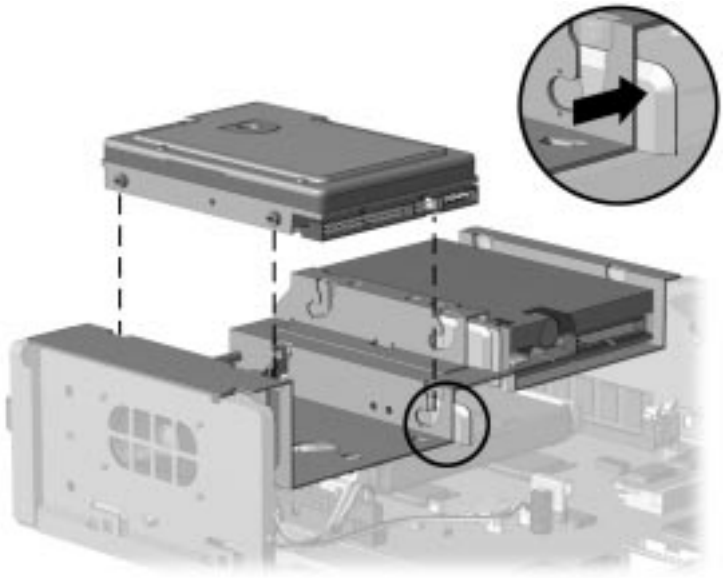
The 3.5-inch hard drive is located on the right side of the computer, in the lower position.

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the Slimline CD-ROM drive, if present (Section 5.17.2).
4. Tilt the drive bay to the upright position.
5. Disconnect the cables from the back of the drive.



Disconnecting the Cables from the Back of the Hard Drive

6. Move the drive release latch on the right side of the drive to the right, slide the drive to the rear of the bay, then, lift the drive from the bay.



Removing the Hard Drive

When replacing this drive, transfer the four screws that take the place of drive rails from the old drive to the new one. There are two screws on each side of the drive.

The guide screws mounted in the front two holes are standard-head screws. The guide screws mounted in the rear two holes are shoulder-head screws. The drive release latch will not work properly if the wrong screws are installed in the rear two holes.

To replace the drive, reverse the removal procedures.

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.

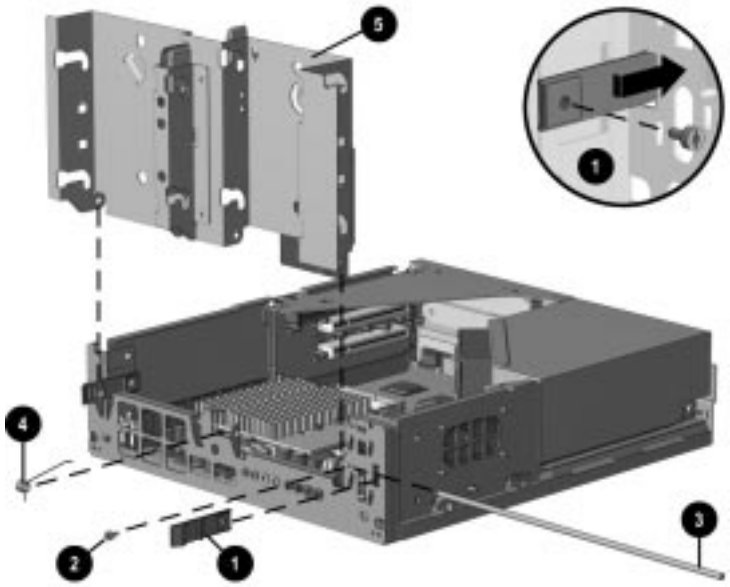
CAUTION: Use only 3/16-inch or 5-mm long screws as guide screws. Longer screws can damage the internal components of the drive.

5.18 Easy Access Drive Cage

1. Prepare the computer for disassembly (Section 5.4).
2. Remove the system unit cover (Section 5.7).
3. Remove the drives from the drive cage (Section 5.17).
4. Disconnect all cables from the back of the drive cage.
5. Remove the latch retainer ❶ from the right side of the chassis (Section 5.8).
6. Remove the hinge locking screw ❷ from the front of the chassis located to the right of the hinge bar.
7. Slide the hinge bar ❸ to the right to disengage it from the hinge tabs.

CAUTION: When removing the hinge bar, make sure that the drive cage spring ❹ does not drop onto the system board.

8. Lift the drive cage ❺ from the chassis.



Removing the Drive Cage

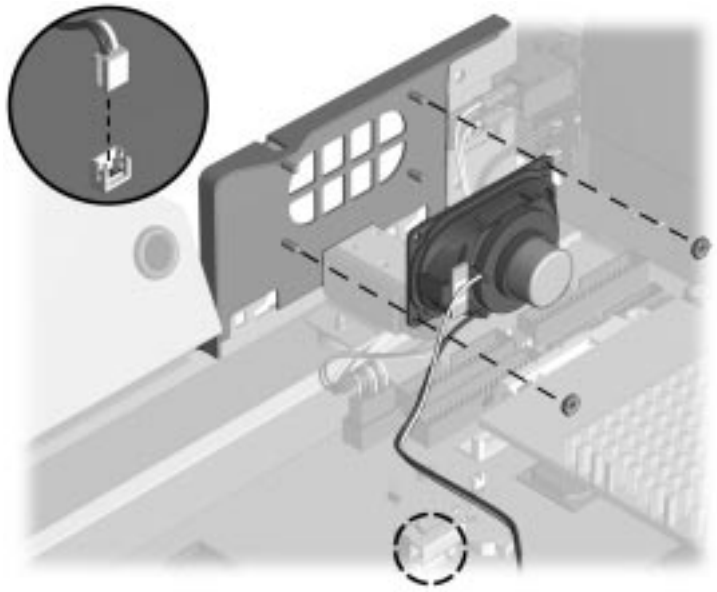
To replace the drive cage, reverse the removal procedure.

5.19 Speaker Removal

1. Prepare the computer for disassembly (Section 5.4).

CAUTION: When the computer is plugged into an AC power source, there is always voltage applied to the system board. You must disconnect the power cord from the power source before opening the computer to prevent system board or component damage.

2. Remove the system unit cover (Section 5.7).
3. Disconnect the speaker wire from the P6 connector next to the battery on the system board.
4. Remove the two nuts that secure the speaker housing to the chassis.
5. Remove the speaker assembly.



Removing the Speaker Assembly

To install the speaker, reverse the removal procedure.

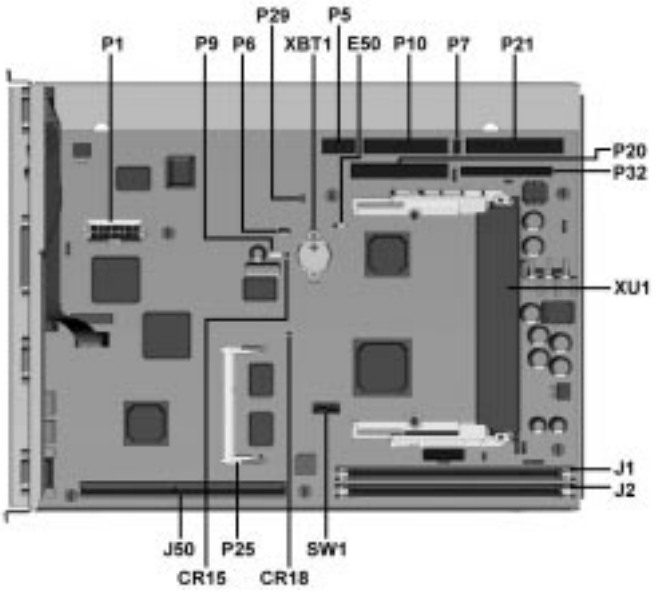
chapter 6

CONNECTOR, JUMPER, AND SWITCH INFORMATION

This chapter provides connector, jumper, and switch information for system board jumpers, system I/O board connectors, and hard drives for the Small Form Factor and Net PC models.

6.1 System Board

6.1.1 Connectors, Jumpers, and Switches



System Board Overview

E50	CMOS Jumper	P20	Primary IDE Connector
J1	DIMM Socket	P21	Secondary Connector
J2	DIMM Socket	P25	Graphics Memory Expansion Connector
J50	Riser Board Socket	P29	SCSI LED Connector
P1	Power Supply Connector	P32	CD-ROM Connector
P5	Power Cable Solenoid and LED Connector	CR15	5V Aux LED
P6	Internal Audio Speaker Connector	CR18	5V Main LED
P7	CD-ROM Audio	SW1	Processor Speed Switches
P9	Wake On LAN	XBT1	External Battery
P10	Diskette Drive Connector	XU1	Processor Socket

6.1.2 SW1 Switch Settings

Switch SW1 allows you to:

- Enable or disable the power-on password (S1).

Setting	Function
On	Disable Password
Off	Enable Password (Default setting)

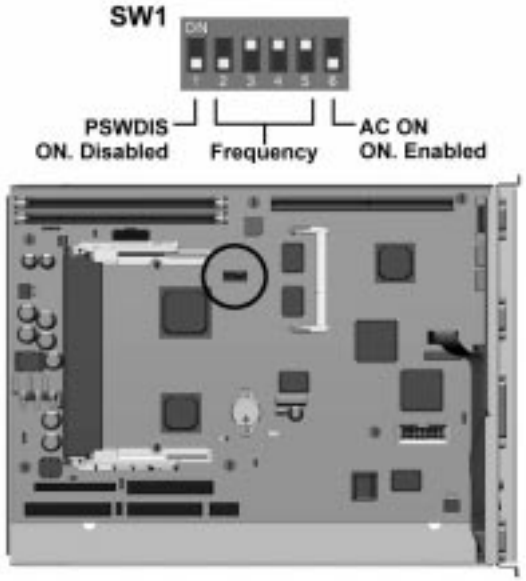
- Set processor speeds after processor upgrade (S2-S5).

66-MHz	100-MHz	S2	S3	S4	S5
233	350	Off	Off	On	On
266	400	On	On	Off	On
300	450	On	Off	Off	On
333	500	Off	On	Off	On

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.

- Enables/disables power-on switch (S6).

Setting	Function
On	System will automatically turn on and boot the operating system as soon as the main power is active.
Off	Enables front bezel-mounted power switch to act as On/Off button or On/Standby/Off button.



Location of SW1 DIP Switches

6.2 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 are part of the reconfiguration process, along with running the Computer Setup utility.

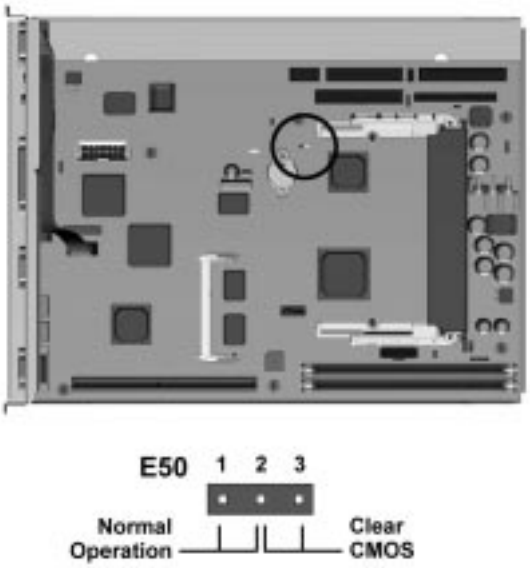
The system board jumper settings are identical for the Small Form Factor and Net PC models.

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

WARNING: Be sure to turn off the computer before changing a jumper setting or damage to the system board can result.

To change the system board jumpers, you must remove the system unit cover. For assembly and disassembly procedures, refer to Chapter 5.

6.2.1 Jumper Locations



Location of the E50 Jumper and Pins 1-3 on the System Board

6.2.2 Clearing Configuration

The computer's configuration (CMOS) may occasionally be corrupted. If it does, it is necessary to clear the CMOS memory.

To clear and reset the configuration, perform the following procedure:

1. Prepare the computer for disassembly (Section 5.4).

CAUTION: The power cord must be disconnected from the power source before changing the jumpers. Failure to do so may damage the system board.

2. Remove the system unit cover (Section 5.7).
3. Remove the E50 jumper from pins 1 and 2 for 60 seconds; then, replace the jumper.
4. Replace the system cover.
5. Turn the computer on.
6. Run the Computer Setup utility to reconfigure the system.

When the jumper is removed, both the power-on password and the setup password become invalid because both are stored in the configuration memory. You will need to reset the passwords.

6.3 Hard Drive Jumper Settings

For more information about Compaq hard drives, refer to Appendix C in this guide. \

6.3.1 Seagate, Fujitsu, and Western Digital

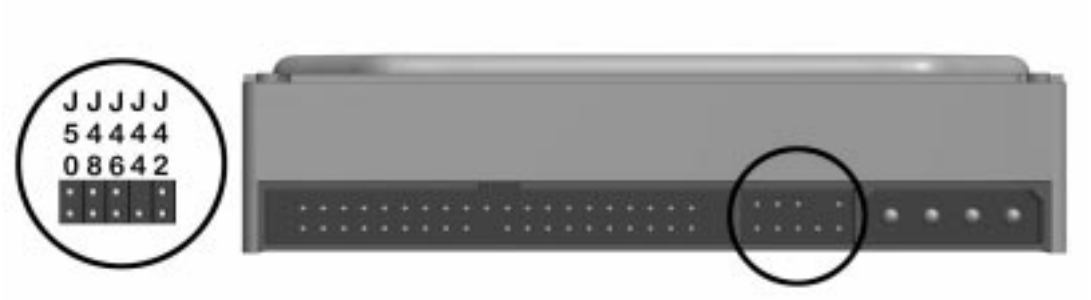
The drawings and tables below apply to a number of different sized drives in the following paragraphs.

Seagate, Fujitsu, and Western Digital Ultra ATA Hard Drive Jumper Settings

Seagate, Fujitsu, and Western Digital Ultra ATA Hard Drive Jumper Settings

Definition	Seagate	Fujitsu	Western Digital
Single	7 - 8	1 - 2 and 3 - 5	3 - 5
Primary	5 - 6 and 7 - 8	1 - 2 and 3 - 5	5 - 6
Secondary	no connection	3 - 5	3 - 4
Cable Select	5 - 6	2 - 4 and 3 - 5	1 - 2

6.3.2 Maxtor



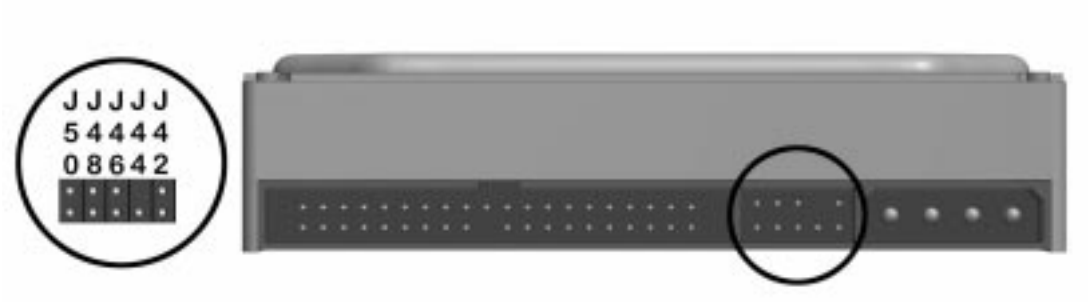
Maxtor Ultra ATA Hard Drive Jumper Settings

Maxtor Ultra ATA Hard Drive Jumper Settings

Definition	J50	J48	J46	J44	J42
Single	J				
Primary (in a dual-drive system)	J				
Secondary	O				
Cable Select					
disabled*		O			
enabled		J			
4092 Cylinder Limitation					
disabled*			O		
enabled			J		
Factory Reserved				O	
Factory Reserved					O

* = default setting
J = jumper
O = no jumper

6.3.2 Maxtor



Maxtor Ultra ATA Hard Drive Jumper Settings

Maxtor Ultra ATA Hard Drive Jumper Settings

Definition	J50	J48	J46	J44	J42
Single	J				
Primary (in a dual-drive system)	J				
Secondary	O				
Cable Select					
disabled*		O			
enabled		J			
4092 Cylinder Limitation					
disabled*			O		
enabled			J		
Factory Reserved				O	
Factory Reserved					O

* = default setting
J = jumper
O = no jumper

chapter 7

SPECIFICATIONS

This chapter provides physical, environmental, and performance specifications for the computer, keyboard, and mass storage devices.

7.1 System

7.1.1 Specifications

Dimensions		
Height	3.6 in	9.0 cm
Width	12.5 in	31.8 cm
Length	14.6 in	37.1 cm
Weight	20 lb	9.1 kg
Power Supply		
Operating Voltage Range	90-132 VAC	180-264 VAC
Rated Voltage Range	100-127 VAC	200-240 VAC
Rated Line Frequency	47-63 Hz	47-63 Hz
Rated Input Current (maximum)	2.4 A	1.2 A
Power Output	90 W	90 W
Environmental Requirements		
Temperature		
Operating	50° to 95F	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 (maximum)	470 Btu/hr	1.97 kg-cal/min

7.1.2 Interrupts

Hardware IRQ	System Function
0	Timer Interrupt (Not on ISA Bus)
1	Keyboard (Not on ISA Bus)
2	Interrupt Controller Cascade (Not on ISA Bus)
3	Unused
4	Serial Port (COM 1)
5	Unused
6	Diskette Drive
7	Parallel Port (LPT 1)
8	Real-Time Clock (Not on ISA Bus)
9	Unused
10	Unused
11	PCI Interrupt
12	Mouse
13	Coprocessor (Not on ISA Bus)
14	IDE Interface Hard Drive
15	CD-ROM

7.1.3 DMA

Hardware DMA	System Function
0	Unused
1	Unused
2	Diskette Drive
3	ECP Parallel Port LPT1 (Default; Alternate = DMA 0)
4	DMA Controller Cascading (Not on ISA Bus)
5	Unused
6	Unused
7	Unused

7.1.4 I/0

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	Unused
132 - 16F	Unused
170 - 177	Reserved
178 - 1EF	Unused
1F0 - 1F7	Fixed Disk Controller
1F8 - 1FF	Unused
200	Unused
201	Unused
202 - 21F	Unused

I/O Address (Hex)	System Function (Shipping Configuration)
220 - 22F	Unused
230 - 277	Unused
278 - 27F	Reserved Parallel Port
280 - 2E7	Unused
2E8 - 2EF	Reserved Serial Port
2F0 - 2F7	Unused
2F8 - 2FF	Reserved Serial Port
300 - 317	Unused
318 - 319	Unused
31A - 36F	Unused
370 - 377	Reserved
378 - 37F	Parallel Port (Primary)
380 - 387	Unused
388 - 38B	FM Synthesizer (OPL III)
38C - 397	Unused
398 - 399	Super AI/O Index/Data (Default; Alt = 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)

7.1.5 Memory Map

Size*	Memory Address	System Function
256 KB	FFFFFFFFh to FFFC0000h	System ROM
3839 MB	FFFBFFFFh to 10000000h	PCI Memory Expansion
255 MB	0FFFFFFFh to 00100000h	HOST or PCI Memory Expansion
128KB	000FFFFFh to 000E0000h	System ROM
96 KB	000DFFFFh to 000C8000h	ISA/PCI option ROMs
32 KB	000C7FFFh to 000C0000h	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.

7.2 Mass Storage Devices

7.2.1 1.44-MB Diskette Drive (Small Form Factor only)

Size and Capacity	
Size (in)	3.5
High Density (MB)	1.44
Low Density (KB)	720
Compaq Spare Part Number	314236-001
Light	Green
Height (inches)	1
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)	18/21
Average (high/low)	94/173
Latency Average (ms)	100

7.2.2 Hard Drives

	3.2 GB	**6.4 GB**
Formatted Capacity		
Physical (GB)	3.2	6.4
Logical (GB)	3.2	6.4
Compaq Spare Part Number	166873-001	166973-001
Drive Type	65 (soft)	65 (soft)
Transfer Rate		
Media (Mb/s)	84.8-136	84.8-136
Interface (MBytes/sec)	33.3	33.3
Seek Time (including settling)		
Single Track (ms)	<1.0	<1.0
Average (ms)	<9.7	<9.7
Full Stroke (ms)	18.0	18.0
Disk Rotational Speed (rpm)	5200	5200
Buffer Size (KB)	256	256

The hard drive is fully partitioned with each partition being 2.0-GB or less.

7.2.3 24X Max Slimline CD-ROM Drive (Small Form Factor Model only)

Applicable Disc	CD-ROM mode1, mode 2 Mixed mode (audio and data combined) CD-DA Photo CD (single and multi-session) CDi ready CD-XA ready
Compaq Spare Part Number	314214-001
Disc Diameter	12 cm, 8 cm
Capacity	550-MB, mode 1, 12 cm 640-MB, mode 2, 12 cm 180-MB, 8cm
Center Hole	15 mm diameter
Disc Thickness	1.2 mm
Track Pitch	1.6 µm
Access Time	
Random	< 140 ms
Full Stroke	< 350 ms
Audio Output Level	0.7V RMS (typical)
Cache Buffer	512 KB
Data Transfer Rate	
Sustained	3600 KB/s (max)
Burst	16.6 MB/sec
X-Factor Characteristic (Speed Step Range)	
Balanced media	24X max 20X max 10X max
Extreme out-of-balance media	4X max

7.3 Audio System (Small Form Factor only)

Sampling rate	4 kHz to 48 kHz (adjustable)
Full Scale Input Voltage (rms)	
Microphone-In	0.050
Full Scale Output Voltage (rms)	
Line Output	1.0
Dynamic Range (SNR)	
Digital Playback	-81 dB
Digital Record	-76 dB
Total Harmonic Distortion	0.061%
Frequency Response (-3 dB cutoffs)	
Line Level (48 kHz)	20 Hz to 20,000 Hz
Speaker	200 Hz to 15,000 Hz
Impedance (nominal)	
Microphone-in	100-K ohms
Line-out	5-K ohms
Data Types	
PCM	8-/16-bit (mono/stereo)
A-Law	8-/16-bit (mono/stereo)
µ-Law	16-bit (mono/stereo)

7.4 Compaq Enhanced Keyboard

Dimensions		
Height	1.50 in	3.81 cm
Width	18.00 in	45.72 cm
Depth	6.50 in	16.51 cm
Weight	3.5 lb	1.59 kg

7.5 Two-Button Mouse

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	

7.6 Supported Graphics Resolutions

7.6.1 ATI RAGE PRO TURBO AGP 2X

Resolution	Colors Supported 4-MB SGRAM	Colors Supported 8-MB SGRAM	Refresh Rate
1600 × 1200	65K	16.7M	85 Hz
1280 × 1024	16.7M	16.7M	85 Hz
1024 × 768	16.7M	16.7M	85 Hz
800 × 600	16.7M	16.7M	85 Hz
640 × 480	16.7M	16.7M	85 Hz

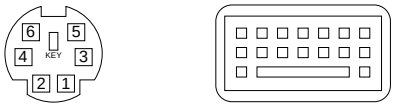
appendix A

CONNECTOR PIN ASSIGNMENTS

Connectors vary by model.

Keyboard

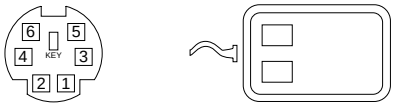
Connector and Icon (Orange)



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

Mouse

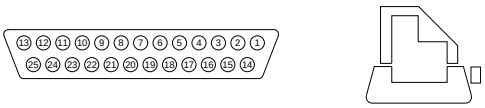
Connector and Icon (Green)



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

Parallel Interface

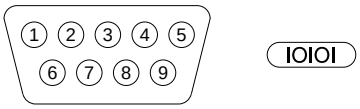
Connector and Icon



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

Serial Interfaces

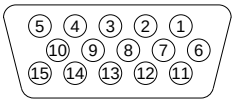
Connector and Icon



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

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)

Microphone Connector

Connector and Icon (Blue)

Pin	Signal
Inside	Data
Outside	Ground

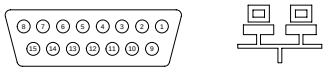
Headphone Connector

Connector and Icon

Pin	Signal
Inside	Data
Outside	Ground

Ethernet AUI

Connector and Icon



Pin	Signal
1	Ground
2	Negative AUI Differential Collision
3	Positive AUI Differential Collision
4	Negative AUI Differential Transmit
5	Positive AUI Differential Transmit
6	Ground
7	Ground
8	Negative AUI Differential Receive
9	Positive AUI Differential Receive
10	+12V
11	Ground
12	Ground
13	Not Used
14	Not Used
15	Not Used
16	Not Used

Line-Out Audio Connector

Connector and Icon

Pin	Signal
Inside	Data
Outside	Ground

Ethernet RJ-45

Connector and Icon

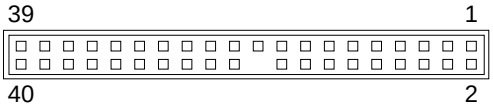
Pin	Signal
1	(+) Transmit Data
2	(-) Transmit Data
3	(+) Receive Data
4	Unused
5	Unused
6	(-) Receive Data
7	Unused
8	Unused

USB Connector

Connector and Icon

Pin	Signal
1	VCC
2	- Data
3	+ Data
4	Ground

IDE/EIDE Drive Cable



Pin	Signal	Pin	Signal	Pin	Signal
1	RESET	15	DD1	29	DMAK
2	GND	16	DD14	30	GND
3	DD7	17	DD0	31	INTRQ
4	DD8	18	DD15	32	IOCS16
5	DD6	19	GND	33	DA1
6	DD9	20	(KEY)	34	PDIAG (80-pin cable detect)
7	DD5	21	DMARQ	35	DA0
8	DD10	22	GND	36	DA2
9	DD4	23	DIOW	37	CS1FX
10	DD11	24	GND	38	CS3FX
11	DD3	25	DIOR	39	DASP
12	DD12	26	GND	40	GND
13	DD2	27	IORDY		
14	DD13	28	CSEL		

Slimline CD-ROM Adapter

Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	RESDRV_	18	D15	35	A0	52	FP05
2	GND	19	GND	36	A2	53	FP06
3	DO7	20	(KEY)	37	CS1FX	54	FP07
4	D08	21	DRQ	38	CS3FX	55	FP08
5	D06	22	GND	39	DASP	56	FP09
6	D09	23	IOW	40	GND	57	FP10
7	D05	24	GND	41	+5VMLOG	58	FP11
8	D10	25	IOR	42	+5VMOT	59	FP12
9	D04	26	GND	43	GND	60	FP13
10	D11	27	IOCHRDY	44	AUDIO_L	61	FP14
11	D03	28	CABLE SELECT	45	A_GND_R	62	FP15
12	D12	29	DAK	46	A_GND_L	63	FP16
13	D02	30	GND	47	AUDIO_R	64	FP17
14	D13	31	IRQ	48	FP01	65	FP18
15	D01	32	IO16	49	FP02	66	FP19
16	D14	33	A1	50	FP03	67	FP20
17	D00	34	PDIAG	51	FP04	68	FP21

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 220-240 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

Any general requirement specific to a *country* is shown in parentheses adjacent to the country together with the accrediting agency for that country.

Country	Accrediting Agency	Country	Accrediting Agency
Australia (1)	EANSW	Italy (1)	IMQ
Austria (1)	OVE	Japan (3)	JIS
Belgium (1)	CEBC	Norway (1)	NEMKO
Canada (2)	CSA	Sweden (1)	SEMKO
Denmark (1)	DEMKO	Switzerland (1)	SEV
Finland (1)	SETI	United Kingdom (1)	BSI
France (1)	UTE	United States (2)	UL
Germany (1)	VDE		

appendix C

HARD DRIVES

Compaq Computer Corporation uses IDE 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, or primary drive and the other as the device 1, or secondary drive. This designation is necessary because both drives cannot work simultaneously.

SMART

The SMART IDE hard drives for the Compaq Deskpro Personal Computers 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 automatically build a soft-drive type to provide support for IDE hard drives that are not in the hard drive parameter table.

The soft-drive types are assigned according to the table below:

Drive	Hard Drive Type	Controller
0	65	Primary
1	66	Primary
0	68	Secondary
1	15	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 F10 Setup to set up the hard drive parameter table without translation.

appendix D

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.

The following table lists the device codes (AABB-CC) and the subtest range (AABB-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.

Summary of Test Error Codes

Error Codes	Device Description
0100 - 0199	Processor (P1)
0200 - 0210	Memory
0301 - 0304	Keyboard
0401 - 0498	Parallel Port
0501 - 0516	Video Display Unit
0600 - 0699	Diskette Drive
0802 - 0824	Monochrome Video Board
1101 - 1109	Serial Port
1201 - 1210	Modem
1700 - 1799	Hard Drive
1800 - 1823	CD-ROM
1900 - 1906	Tape Drive
2113 - 2199	Second Processor (P2)
2402 - 2480	Enhanced Color Graphics (ECG/VGA)
2502 - 2502	Pen/Digitizer
3113 - 3199	Third Processor (P3)
3206 - 3206	Audio System
3300 - 3333	Mediavision Spectrum 16 Multimedia
3400 - 3401	TV Tuner Board
4113 - 4199	Fourth Processor
5100 - 5130	Plasma Display System
5234 - 5240	Advanced Color Graphics (AGC)
6000 - 6089	Network Card
6500 - 6599	SCSI Hard Drives
6600 - 6699	SCSI CD-ROM Drives
6700 - 6799	SCSI Tape Drives
7000	Server Manager/R Board
8601	Auxiliary Input Interface
8700 - 8702	Game Port

The remaining tables 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 Chapter 5, "Removal and Replacement Procedures."

Test Error Codes

Microprocessor

Codes	Description	Recommended Action
0101-xx	CPU test failed.	Replace system board and retest.
0102-xx	Coprocessor error.	Run Computer Checkup or Computer Setup and retest. Replace system board and retest.
0103-xx	DMA controller failed.	Replace system board and retest.
0104-xx	Interrupt controller failed.	Replace system board and retest.
0105-xx	Port error.	Replace system board and retest.
0106-xx	Keyboard controller self-test failed.	Replace system board and retest.
0107-xx	CMOS RAM test failed.	Replace battery/clock module and retest. Replace system board and retest.
0108-xx	CMOS interrupt test failed	1. Replace battery/clock module and retest. 2. Replace system board and retest.
0109-xx	CMOS clock test failed.	1. Replace battery/clock module and retest. 2. Replace system board and retest.
0110-xx	Programmable timer test failed.	Replace system board and retest.
0113-01	Protected mode test failed.	Replace system board and retest.
0114-01	Speaker test failed.	1. Verify speaker connection. 2. Replace system board and retest.

Memory

Codes	Description	Recommended Action
0200-xx	Memory machine ID test failed.	Reinsert memory modules and retest.
0202-xx 0203-xx 0204-xx 0205-xx 0209-xx 0211-xx	Memory system ROM checksum failed. Memory write/read test failed Memory address test failed. Memory walking 1s test failed RAM long test failed Random pattern 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 the system board and retest.
0212-xx	Cache test failed	Replace system board and retest.
0214-xx 0215-xx	Noise test failed. 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 system board and retest.

Keyboard

Codes	Description	Recommended Action (0300-0304)
0300-xx 0301-xx 0302-xx 0304-xx	Keyboard ID test failed. Keyboard self-test/interface test failed. Individual key test failed. Keyboard repeat test failed.	1. Check keyboard connection. If disconnected, turn the computer off and connect the keyboard. 2. Replace keyboard and retest. 3. Replace system board and retest.

Parallel Printer

Codes	Description	Recommended Action (0401-0403)
0401-xx 0402-xx 0403-xx	Printer failed or not connected. Printer port test failed. Printer pattern test failed.	1. Connect printer. 2. Check power to the printer. 3. Install loop-back connector and retest. 4. Replace system board and retest.

Diskette Drive

Codes	Description	Recommended Action (0600-0610)
0600-xx 0601-xx 0602–xx 0603–xx 0604–xx 0605–xx 0606–xx 0610–xx	Diskette ID drive types test failed. Diskette format failed. Diskette read test failed. Diskette write, read, compare test failed. Diskette random seek test failed. Diskette ID media test failed. Diskette speed test failed. Diskette change line test failed.	1. Replace diskette media and retest. 2. Check and/or replace diskette power and signal cables and retest. 3. Replace diskette drive and retest. 4. Replace system board and retest.

Serial Port

Codes	Description	Recommended Action
1101-xx	Serial port test failed.	1. Run Computer Setup or Windows NT or Windows 95 utilities 2. Replace system board and retest.

Modem Communications

Codes	Description	Recommended Action (1201-1210)
1201-xx	Modem internal test failed.	1. Disconnect from the phone line and retest. 2. Check phone number. 3. Check modem line. 4. Replace modem and retest.
1203-xx	Modem external termination test failed.	
1204-xx	Modem auto originate test failed.	
1205-xx	Modem auto answer test failed.	
1210-xx	Modem direct connect test failed.	

Hard Drive

Codes	Description	Recommended Action (1701-1736)
1701-xx	Hard drive format test failed.	1. Run Computer Setup and verify drive type. 2. Replace hard drive signal and power cables, and retest. 3. Replace hard drive and retest. 4. Replace system board and retest.
1702-xx	Hard drive read test failed.	
1703-xx	Hard drive write/read/compare test failed.	
1704-xx	Hard drive random seek test failed.	
1705-xx	Hard drive controller test failed.	
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

Tape Drive

Codes	Description	Recommended Action (1900-1910)
1900-xx	Tape drive ID test failed.	1. Replace tape cartridge and retest. 2. Check and/or replace signal cable and retest. 3. Check switch settings on the adapter board (if applicable). 4. Replace tape adapter board (if applicable) and retest. 5. Replace tape drive and retest. 6. Replace system board and retest.
1901-xx	Tape drive servo test failed.	
1902-xx	Tape drive format or format verification test failed.	
1903-xx	Tape drive sensor test failed.	
1904-xx	Tape drive BOT/EOT test failed.	
1905-xx	Tape drive read test failed.	
1906-xx	Tape drive write/read/compare failed.	
1910-xx	Tape erase test failed.	

Video

Codes	Description	Recommended Action
2401-xx	Graphics controller test failed.	1. Replace video board and retest. 2. Replace system board and retest.
2402-xx 2403-xx 2404-xx 2405-xx 2406-xx 2408-xx 2409-xx 2410-xx 2411-xx 2412-xx 2418-xx 2419-xx	Video memory test failed. Video attribute test failed. Video character set test failed. Video 80×25 mode 9×14 character cell test failed. Video 80×25 mode 8×8 character cell test failed. Video 320×200 mode color set 0 test failed. Video 320×200 mode color set 1 test failed. Video 640×200 mode test failed. Video screen memory page test failed. Video gray scale test failed. ECG/VGC memory test failed. ECG/VGC ROM checksum test failed.	1. Run the Configuration and Diagnostics utilities. 2. Replace monitor and retest. 3. Replace video/system board and retest.
2420-xx	Graphics attribute test failed.	1. Replace monitor and retest. 2. Replace video board and retest. 3. Replace system board and retest.
2421-xx 2422-xx 2423-xx 2424-xx 2425-xx 2431-xx 2432-xx 2448-xx 2451-xx 2451-xx 2456-xx	ECG/VGC 640 × 200 graphics mode test failed. ECG/VGC 640 × 350 16 color set test failed. ECG/VGC 640 × 350 64 color set test failed. ECG/VGC monochrome text mode test failed. ECG/VGC monochrome graphics mode test failed. 640 × 480 graphics test failure. 320 × 200 graphics (256 color mode) test failure. Advanced VGA Controller test failed. 132-column Advanced VGA test failed. 132-column Advanced VGA test failed. Advanced VGA 256 Color test failed.	1. Run Configuration and Diagnostics utilities. 2. Replace monitor and retest. 3. Replace video/system board and retest.
2458-xx 2468-xx 2477-xx 2478-xx 2480-xx	Advanced VGA BitBLT test. Advanced VGA DAC test. Advanced VGA data path test. Advanced VGA BitBLT test. Advanced VGA Linedraw test.	1. Replace video board and retest. 2. Replace system board and retest.

Audio

Codes	Description	Recommended Action
3206-xx	Audio System Internal Error.	Replace 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).

Network Interface

Codes	Description
6000-xx	Network ID test failed.
6014-xx	Network configuration test failed.*
6016-xx	Network reset test failed.*
6028-xx	Network internal test failed.*
6029-xx	Network external test failed.*
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.

Recommended Action (6000-6089)

1. Run Computer Setup or Windows NT or Windows 95 utilities.
2. Verify test procedures.
3. Replace network board, if installed.
4. Replace system board.

SCSI CD-ROM

Codes	Description
6600-xx	ID test failed.
6605-xx	Read test failed.
6608-xx	Controller test failed.
6623-xx	Random read test failed.

Recommended Action (6600-6623)

1. Replace CD media and retest.
2. Check jumper settings on the adapter board.
3. Verify that the speakers are connected.
4. Check and/or replace the power and signal cables and retest.
5. Replace CD-ROM drive and retest.

Pointing Device

Codes	Description
8601-xx	Mouse test failed.
8602-xx	Interface test failed.

Recommended Action (8601-8602)

1. Replace with a working mouse and retest.
2. Replace 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 tables below.

- AA - SCSI Device Names identifies the drive type being tested
- BB - SCSI Test Names identifies the test being conducted
- CC - SCSI Test Error Code identifies the exact code received

AA	BB	CC
hard drive	random-read	seek failure
65	23	-05

For example, a diagnostic error code of 6523-05 indicates that the diagnostics program was testing the random-read function of the hard drive and received a seek failure. The device is faulty and must be replaced.

SCSI Device Names

65xx-xx	Hard Drive
66xx-xx	CD-ROM Drive and PD-CD Drive
67xx-xx	Tape Drive

SCSI Test Names

xx00-xx	ID
xx05-xx	Read
xx06-xx	SA/Media
xx-xx	Controller
xx09-xx	Media erase
xx23-xx	Random read
xx28-xx	Media load/unload

SCSI Test Error Codes

Code	Description	Recommended Action
xxxx-02	Drive not installed.	Check cable connections.
xxxx-03	Media not in drive.	Check for and install a data CD or write-enabled tape in drive.
xxxx-05	Seek failure.	Replace indicated device.
xxxx-06	Drive timed out.	Replace indicated device.
xxxx-07	Drive busy.	Replace indicated device.
xxxx-08	Drive already reserved.	Replace indicated device.
xxxx-09	Unknown.	
xxxx-10	Unknown.	
xxxx-11	Media soft error.	Replace indicated device.
xxxx-12	Drive not ready.	Replace indicated device.
xxxx-13	Media error.	Replace indicated device.
xxxx-14	Drive hardware error.	Replace indicated device.
xxxx-15	Illegal drive command.	Replace indicated device.
xxxx-16	Media was changed.	Replace 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.
66xx24	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.	

SCSI Test Error Codes

xxxx-30	Controller timed out.	Replace indicated device. (xxxx-30 through xxxx-65)
xxxx-31	Unrecoverable error.	
xxxx-32	Controller/drive disconnected.	
xxxx-33	Illegal controller command.	
xxxx-34	Invalid SCSI bus phase.	
xxxx-35	Invalid SCSI bus phase.	
xxxx-36	Invalid SCSI bus phase.	
xxxx-39	Error status from drive.	
xxxx-40	Target timed out.	
xxxx-41	SCSI bus stayed busy.	
xxxx-42	ACK/REQ lines bad.	
xxxx-43	ACK did not deassert.	
xxxx-44	Parity error.	
xxxx-50	Data pins bad.	
xxxx-51	Data line 7 bad.	
xxxx-52	MSG, C/D, and/or I/O lines bad.	
xxxx-53	BSY never went busy.	
xxxx-54	BSY stayed busy.	
xxxx-60	Controller CONFIG-1 register bad.	
xxxx-61	Controller CONFIG-2 register bad.	
xxxx-65	Media not unloaded.	
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 **E**

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.

Power-On Self-Test Messages

Message	Beeps*	Probable Cause	Recommended Action
101-ROM Error	1L, 1S	System ROM checksum.	1. Flash the ROM. 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 is 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 the Configuration and Diagnostics utilities.

L=Long, S=Short

206-Secondary cache controller failure	None	Cache memory controller or RAM failure.	Run the Configuration and Diagnostics utilities.
207-ECC corrected single bit error	2S	Single Bit ECC error	Replace DIMM if error persists.
213-Incompatible DIMM module	2S	DIMM is not fully compliant with SPD standard or is electrically incompatible with the hardware.	Replace DIMM.
301-Keyboard Error	None	Keyboard failure.	Reconnect keyboard with computer turned off.
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 with computer turned off. 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.
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.
612-Secondary Floppy Port Address Assignment Conflict	2S	Configuration error.	Run Computer Setup or Windows NT or Windows 95 utilities.

L=Long, S=Short

912-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.
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.	Run the Configuration and Diagnostics utilities.
1781-Disk 1 Failure	None	Hard drive/format error.	Run the Configuration and Diagnostics utilities.
1782-Disk Controller Failure	None	Hard drive circuitry error.	Run the Configuration and Diagnostics utilities.
1790-Disk 0 Failure	None	Hard drive error or wrong drive type.	Run the Configuration and Diagnostics utilities.
1791-Disk 1 Failure	None	Hard drive error or wrong drive type.	Run the Configuration and Diagnostics utilities.

L=Long, S=Short

1792-Secondary Disk Controller Failure	None	Hard drive circuitry error.	Run the Configuration and Diagnostics utilities.
1793-Secondary Controller or Disk Failure	None	Hard drive circuitry error.	Run the Configuration and Diagnostics utilities.
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.
Audible	2S	Power-on successful.	None.

L=Long, S=Short

appendix F

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 powerup?
- Was a bootable compact disc in the CD-ROM drive at powerup?
- Are all switch settings correct?
- Have all jumper settings been set as instructed by the configuration utility?
- Was Computer Setup run after installing options (memory, disk drives, expansion boards, etc.) and before installing industry standard architecture (ISA) boards?

Power

Problem	Possible Solution
Computer will not turn on.	1. Ensure that the computer is connected to a power source. 2. Cables to the external power source are unplugged. Ensure that cables connecting the computer and the external source are plugged in properly. 3. 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 Chapter 5 for replacement procedures.

Diskette Drive

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.
Problem has occurred with a disk transaction.	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.	Check the cables for loose connections.

Printer

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. 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. Correct printer drivers for the application are not installed. Install the correct printer driver for the application. 2. Cables may not be connected properly. Reconnect all cables.
Printer is off line.	Printer may be out of paper. Check the paper tray and refill it if it is empty. Select online.

Display

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. Brightness need adjusting. Adjust the brightness control. 5. QuickBlank feature has been enabled through Security Management. Run Computer Setup and disable the QuickBlank feature. 6. Energy saver feature has been enabled. Hit any key or type the password. 7. 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 on the diskette included in the upgrade kit.

Picture is broken up, 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.	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.

Memory

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. 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.	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.
System won't boot or does not function properly after installing additional memory modules.	Memory module is not correct type or speed grade for the system. Replace module with an industry standard, SPD-compliant 168-pin synchronous dynamic random access memory (SDRAM) DIMM that meets the following criteria (if you do not know the system bus speed, run Computer Setup to determine it): <u>66 MHz Bus Speed</u> • Rated for 66 MHz or faster operation • Has an access time (CLK to Q) of 9 ns or less • Cycle time of 15 ns • Supports CAS latency of 2 or 3 operation <u>100 MHz Bus Speed</u> • Rated for 100 MHz or faster operation • Has an access time (CLK to Q) of 6 ns or less • Cycle time of 10 ns • Supports CAS latency of 2 or 3 operation

Hard Drive

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.

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.	1. Either the directory structure is bad or there is a problem with a file. 2. 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. 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. System is trying to start from a diskette that is not bootable. Remove the diskette from the diskette drive. 2. 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

Problem	Possible Solutions
New device is not recognized as part of the computer system.	1. 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. 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. Cables for the new external device are loose or the power cables are unplugged. Check all cables. 6. 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.
Computer supports Plug and Play, but the hardware configuration settings in Computer Setup do not match the settings in Windows 95 Device Manager.	1. In Windows 95: when onboard serial devices are assigned to ports other than COM1 or COM2, the configuration is 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. 2. 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.

SCSI

Problem	Cause	Solution
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.

✎ Units with both IDE and SCSI devices will not boot from a SCSI drive.

CD-ROM Drive

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.	3. The CD-ROM boot is not enabled through the Computer Setup utility. Run the Computer Setup utility and set the drive priorities. 4. 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.	CD is not properly seated in the drive. Turn off the computer and insert a thin metal rod into the emergency eject hole and push firmly (a straightened paper clip can be used). Slowly pull the tray out from the drive until the tray is fully extended, then remove the CD.
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.

Network

These guidelines do not discuss the process of debugging network cabling.

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 an unprogrammed EPROM.	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.
	Network controller is defective.	Replace the controller or the system board.
	Network drivers are not loaded.	Boot the computer without the network drivers, using a system boot diskette, and reconfigure the network controller.

Diagnostics reports a failure.	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.
	Cable is not securely connected.	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.
	Cable is attached to the incorrect connector.	Ensure that the cable is attached to the correct connector.
	There is a problem with the cable or a device at the other end of the cable.	Ensure that the cable and device at the other end are operating correctly.
	Network controller is defective.	Replace the controller or the system board.
	Network controller interrupt or memory overlaps the interrupt or memory of an expansion board.	Run Computer Setup and modify the network controller memory value.
Diagnostics passes, but computer does not communicate with the network.	Network drivers not loaded, or driver parameters do not match current configuration.	Make sure the network drivers are loaded and that the driver parameters match the configuration of the network controller.
	Network controller is not configured for this computer.	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.
	Network controller interrupt or memory overlaps the interrupt or memory of an expansion board.	Run Computer Setup and modify the network controller memory value.
Network controller stopped working when an expansion board was added to the computer.	Network drivers not loaded or driver parameters do not match current configuration.	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.
	Cable is not securely connected.	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.

	Network controller interrupt or memory overlaps the interrupt or memory of another expansion board.	Run Computer Setup and modify the network controller memory value.
	Network controller requires drivers.	Verify that the drivers were not accidentally deleted when the drivers for a new expansion board were installed.
	Files containing the network drivers are corrupted.	Reinstall the network drivers, using the backup diskettes and then run Computer Setup.
Network controller stopped working without apparent cause.	Files containing network drivers are corrupted.	Reinstall the network drivers using the backup diskettes and then run Computer Setup.
	Cable is not securely connected.	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.
	Network controller is defective.	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:

Item	Setting
Base I/O address	220H
FM Synthesizer OPL III	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 cards and other 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.

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