COMPAQ

Compaq Service
Reference Guide

Compaq Deskpro Personal Computers
Compaq Professional Workstations

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Compaq Professional Workstations

Notice

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Compaq Service Reference Guide

Compaq Deskpro Personal Computers
Compaq Professional Workstations

Compaq Computer Corporation

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preface

ABOUT THIS GUIDE

This *Compaq Service Reference Guide* is a troubleshooting and repair guide that can be used for reference when servicing the Compaq Deskpro Personal Computers and Compaq Intel-based Workstations. Only authorized technicians trained by Compaq should attempt to repair this equipment.

Compaq Computer Corporation reserves the right to make changes to all Compaq Personal Computers and Workstations without notice.

All features identified in this document may not be available on all Compaq Products.

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, or clarifying information.

The following warning symbols are located on applicable components of some products and should be observed to avoid personal injury or component damage:

> ⚠ ⚠ **WARNING:** Any surface or area of the equipment marked with these symbols indicates the presence of a hot surface or hot component. If this surface is contacted, the potential for injury exists. To reduce risk of injury from a hot component, allow the surface to cool before touching.

> ⚠ ⚠ **WARNING:** Any surface or area of the equipment marked with these symbols indicates the presence of electrical shock hazards. The enclosed area contains no operator-serviceable parts. To reduce risk of personal injury from electrical shock hazards, do not open this enclosure.

> ⚠ ⚠ **WARNING:** Any RJ-45 receptacle marked with these symbols indicates a Network Interface Connection. To reduce risk of electrical shock, fire, or damage to the equipment, do not plug telephone or telecommunications connectors into this receptacle.

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.

⚠ **WARNING:** To reduce the risk of personal injury from electrical shock and hazardous energy levels, only authorized service technicians should attempt to make repairs to this equipment. Do not exceed the level of repair specified in these procedures.

Because of the complexity of the individual boards and subassemblies, do not attempt to make repairs at the component level or to make modifications to any printed wiring board. Improper repairs could create conditions that are hazardous.

⚠ **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.

✎ The installation of options and servicing of this product shall be performed by individuals who are knowledgeable of the procedures, precautions, and hazards associated with equipment containing hazardous energy circuits.

Additional Documentation

- The following documentation is available to support these products:
- User Documentation
- Technical Training Guides
- Compaq Service Advisories and Bulletins
- *Compaq QuickFind*
- *Compaq Technical Reference Guide*
- *Compaq Service Quick Reference Guide*
- *Compaq Maintenance & Service Guide*
- *Compaq Quick Troubleshooting Guide*

chapter 1

INSTALLING THE OPERATING SYSTEM

Depending on the model, Microsoft Windows 95, 98, Microsoft Windows 2000 Professional, or Microsoft Windows NT is preinstalled on the computer and will be configured automatically the first time the computer is turned on.

$\triangle$ **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.

$\triangle$ **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.

1.1 Microsoft Windows 95 or 98

The first time the computer is turned on, Microsoft Windows is automatically installed. This takes approximately 5 to 20 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.

1.1.1 Installing or Upgrading Device Drivers

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

The Windows Cab files directory and its subdirectories provide the Compaq-specific integration of the operating system and include supported device drivers. The Cab files directory path is c:\Windows\Options\Cab. However, if you are using the *Compaq Restore* CD, the Cab files are located in c:\Compaq\Win95 when using Windows 95 and in c:\Windows\Options\Cab when using Windows 98.

1.2 Microsoft Windows NT Workstation 4.0 or Windows 2000 Professional

The first time you turn on your computer, the operating system is automatically installed for you. This takes approximately 10 to 20 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.

1.2.1 Installing or Upgrading Device Drivers for Windows NT Workstation 4.0 and Windows 2000 Professional

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

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

When prompted for the I386 directory on the operating system 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. For Windows NT 4.0, reapply Service Pack 6A by clicking its icon located on the computer desktop. For Windows 2000, no further steps are required.

✎ When reapplying the service pack for Windows NT 4.0, if you are prompted to replace a file with a newer version, always choose Yes.

There is no service pack for Windows 2000 Professional.

1.2.3 Creating an Emergency Repair Diskette for Windows NT Workstation 4.0

✎ Not all Compaq computers equipped with Windows NT support this feature.

This section applies only to computers equipped with a diskette drive.

After installing Microsoft Windows NT, Compaq recommends that you create an Emergency Repair Diskette. Using one blank, formatted diskette, complete the following steps:

1. Click Start → Run.

2. In the dialog box enter:
   C:\RDISK.EXE

3. Read and follow the instructions that appear on the screen.

1.2.4 Using the Emergency Repair Diskette with Windows NT Workstation 4.0

✎ Not all Compaq computers equipped with Windows NT support this feature.

The following section applies only to computers equipped with a diskette drive.
The Emergency Repair Diskette cannot be used on an LS-120 drive.

To use the Emergency Repair Diskette, insert the emergency repair diskette in the diskette drive and restart the computer. Follow the instructions displayed on the screen.

1.3   Converting to NTFS

1.3.1   Windows NT Workstation 4.0

The hard drive included with a Windows NT Workstation 4.0 model contains a primary FAT16 partition on which the operating system and Compaq software are installed. The rest of the hard drive is divided into one or more additional partitions. Because FAT16 only supports partitions up to 2 GB, converting to NTFS will allow hard drives larger than 2 GB to be partitioned as one large drive. To convert an existing partition from a 2 GB FAT 16 partition to a 2 GB NTFS partition:

1. Click Start →Run.

2. Type CONVERT.EXE X: /FS:NTFS where X is the drive letter designating the partition you wish to convert.

Alternatively, the *Compaq Restore* CD can be utilized to repartition the hard drive. The largest NTFS partition possible is 7.5 to 8.0 GB, depending on the hard drive, with a second NTFS partition created from the remaining space on the drive.

CAUTION: The following procedures will remove all of the software applications and data files from your hard drive. Be sure to back up any data files you have created prior to converting from FAT16 to NTFS, or you will not be able to restore them.

You will be able to restore the operating system and drivers required to access the Internet from the *Compaq Restore* CD. The operating system (without Compaq software or optimized drivers) may be restored from the operating system installation CD or diskettes.

If the computer does not have a CD-ROM drive, other means of installation, such as a network share, will be needed for this procedure.

Insert the *Compaq Restore* CD, version 2.0 or higher, into the CD-ROM drive and turn on or restart the computer. Read and follow the instructions that appear on the screen to change the drive partitioning.

1.3.2   Windows 2000 Professional

To convert an existing partition from a FAT 32 partition to an NTFS partition, double-click the NTFS Convert icon on the desktop. Carefully read and follow the directions that appear on the screen.

1.4 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. To register one machine, just visit Compaq's Web site at www.compaq.com/products/registration and follow the instructions that appear on the screen. To register more than one machine, either telephone in the information or enter the units one at a time on the Compaq Web site.

1.5 Compaq Software

The Microsoft Windows 95, 98, Windows NT Workstation 4.0, or Windows 2000 Professional 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
- Compaq Configuration Record
- Online *Compaq Safety & Comfort Guide*
- Intelligent Manageability
- Enhanced Compaq Insight Personal Edition (Diagnostics for Windows)
- DMI Support
- Power Management with energy saver features
- Security Management tools
- Software Support 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 Section 3.4.7, "Enhanced Support Software CD and World Wide Web Site," for ordering information)
- Compaq Web Site at www.compaq.com
- *Compaq Deskpro Supplement CD,* which is supplied with many desktop models

chapter 2

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.

✎ All features identified in this chapter may not be available on all Compaq products.

2.1 Computer Setup Utilities

Use Computer Setup Utilities to do the following:

- Modify or restore 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.

- Configure Quiet Drive options (for drives that support this feature).

- 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 Post Messages Enabled or Disabled to change the display status of Power-On Self-Test (POST) messages. Post Messages Disabled 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 Post Messages Enabled during POST, press any key (except F10 or F12).

- Establish 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 integrated I/O functionality, including the serial, USB, or parallel ports, audio, or embedded NIC, so that they cannot be used until they are unsecured.

- Enable or disable Master Boot Record (MBR) Security.

- 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.

- Execute self-tests on a specified IDE hard drive.

- Configure various energy-saving features including energy saver mode, system and hard drive timeouts, power button mode, and power LED behavior.

2.1.1　Using Computer Setup Utilities

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

1. Turn on or restart the computer. To restart the computer in Windows or Windows NT, 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.

   Pressing the F12 key initiates Network Service Boot for Remote System Installation.

   A choice of five headings appears in the Computer Setup Utilities menu: File, Storage, Security, Power, and Advanced. Section 2.1.2 in this chapter provides more information about the features that are available.

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.

✎ Be sure to configure new options and drivers in the operating system after they have been configured by the Setup Utility.

Power-On Self-Test (POST)

POST is a series of diagnostic tests that runs automatically when the system is turned on, POST checks the following items to ensure that the computer system is functioning properly:

■ Keyboard

■ Memory modules

■ Diskette drives

■ All IDE and SCSI mass storage devices

■ Processors

■ Controllers

✎ If the Power-On Password is set, a key icon appears on the screen while POST is running. You will need to enter the password before continuing. Refer to Chapter 3 for information on setting, deleting, or bypassing the password.

If POST finds an error in the system, an audible and/or visual message occurs. Refer to Appendix D for POST error Messages and their solutions.

2.1.2　Computer Setup Menu

Heading	Option	Description
File	System Information	Lists product name, processor type/speed/stepping, cache size, system ROM family and version, installed memory size, system board revision, chassis serial number, integrated MAC for embedded, enabled NIC (if applicable), and asset tracking number.
	Set Time and Date	Allows you to set system time and date.
	Save to Diskette	Saves system configuration to a blank 1.44-MB diskette.
	Restore from Diskette	Restores system configuration from a diskette.
	Set Defaults and Exit	Restores factory default settings and clears all passwords.
	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	Device Configuration	Lists all installed storage devices. The following options appear when a device is selected:

Diskette Type (*For* legacy diskette drives only)
Identifies the highest capacity media type accepted by the diskette drive. Options are 3.5" 1.44 MB, 3.5" 720 KB, 5.25" 1.2 MB, 5.25" 360 KB, and Not Installed.

Drive Emulation (*IDE devices only*)
Allows you to select a drive emulation type for a storage device. (For example, a Zip drive can be made bootable by selecting disk emulation.)

Drive Type	Emulation Options
Hard disk	No emulation options available.
Diskette	None (treated as diskette drive)
	Disk (treated as hard drive)
CD-ROM	None (treated as CD-ROM drive)
	Diskette (treated as diskette drive)
	Disk (treated as hard drive)
Other (e.g., Zip drive)	None (treated as Other)
	CD-ROM (treated as CD-ROM drive)
	Diskette (treated as diskette drive)
	Disk (treated as hard drive)

Transfer Mode (*IDE devices only*)
Specifies the active data transfer mode. Options (subject to device capabilities) are PIO 0, Max PIO, Enhanced DMA, Ultra DMA 0, and Max UDMA.

Continued

Computer Setup Menu Continued

Heading	Option	Description
Storage	Device Configuration (continued)	**Translation Mode** (*IDE disks only*) Lets you select the translation mode to be used for the device. This enables the BIOS to access disks partitioned and formatted on other systems and may be necessary for users of older versions of Unix (e.g., SCO Unix version 3.2). Options are Bit-Shift, LBA Assisted, User, and None.

⚠ **CAUTION:** Ordinarily, the translation mode selected automatically by the BIOS should not be changed. If the selected translation mode is not compatible with the translation mode that was active when the disk was partitioned and formatted, the data on the disk will be inaccessible.

Translation Parameters (*IDE Disks only*)
Allows you to specify the parameters (logical cylinders, heads, and sectors per track) used by the BIOS to translate disk I/O requests (from the operating system or an application) into terms the hard drive can accept. Logical cylinders may not exceed 1024. The number of heads may not exceed 256. The number of sectors per track may not exceed 63. These fields are only visible and changeable when the drive translation mode is set to User.

Multisector Transfers (*IDE ATA devices only*)
Specifies how many sectors are transferred per multi-sector PIO operation. Options (subject to device capabilities) are Disabled, 8, and 16.

Quiet Drive (*available on select drives only*)

· Performance
  Allows the drive to operate at maximum performance.

· Quiet
  Reduces noise from the drive during operation. When set to Quiet, the drive will not operate at maximum performance.

If the drive does not support Quiet mode, the Quiet Drive option will not be displayed.

Removable Media Boot
Enables/disables ability to boot the system from removable media.

Note: After saving changes to Removable Media Boot, the computer will restart. Turn the computer off, then on, manually.

Removable Media Write
Enables/disables ability to write data to removable media.

Note: This feature applies only to legacy diskette, IDE LS-120 SuperDisk, and IDE PD-CD drives.

Primary IDE Controller
Allows you to enable or disable the primary IDE controller.

Continued

Computer Setup Menu Continued

Heading	Option	Description
Storage	Device Configuration (continued)	**Secondary IDE Controller**
		Allows you to enable or disable the secondary IDE controller.
		Diskette MBR Validation
		Allows you to enable or disable strict validation of the diskette Master Boot Record (MBR).
		Note: If you use a bootable diskette image that you know to be valid, and it does not boot with Diskette MBR Validation enabled, you may need to disable this option in order to use the diskette.
	DPS Self-Test	Allows you to execute self-tests on IDE hard drives capable of performing the Drive Protection System (DPS) self-tests.
		Note: This selection will only appear when at least one drive capable of performing the IDE DPS self-tests is attached to the system.
	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 Section 3.2, "Asset Tracking and Security," for more information.
	Power-On Password	Enables power-on password.
		See Section 3.2, "Asset Tracking and Security" for more information.
	Password Options	Enables/disables network server mode.
		Specifies prompting for power-on password.
		See Section 3.2, "Asset Tracking and Security," 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. (Feature supported on select models only.)
		Lists most recent cover removal. (Feature supported on select models only.)
		See Section 3.2, "Asset Tracking and Security," for more information.

Continued

Computer Setup Menu Continued

Heading	Option	Description
Security (continued)	Master Boot Record Security	Allows you to enable or disable Master Boot Record (MBR) Security. When enabled, the BIOS rejects all requests to write to the MBR on the current bootable disk. Each time the computer is powered on or rebooted, the BIOS compares the MBR of the current bootable disk to the previously-saved MBR. If changes are detected, you are given the option of saving the MBR on the current bootable disk, restoring the previously-saved MBR, or disabling MBR Security. You must know the setup password, if one is set.
		Note: Disable MBR Security before intentionally changing the formatting or partitioning of the current bootable disk. Several disk utilities (such as FDISK and FORMAT) attempt to update the MBR. If MBR Security is enabled and disk accesses are being serviced by the BIOS, write requests to the MBR are rejected, causing the utilities to report errors. If MBR Security is enabled and disk accesses are being serviced by the operating system, any MBR change will be detected by the BIOS during the next reboot, and an MBR Security warning message will be displayed.
	Save Master Boot Record	Saves a backup copy of the Master Boot Record of the current bootable disk.
		Note: Only appears if MBR Security is enabled.
	Restore Master Boot Record	Restores the backup Master Boot Record to the current bootable disk.
		Note: Only appears if all of the following conditions are true:
		· MBR Security is enabled
		· A backup copy of the MBR has been previously saved
		· The current bootable disk is the same disk from which the backup copy of the MBR was saved
	Device Security	Enables/disables serial, parallel, USB ports, network (some models) and audio security.
	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.
		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.
		Allows setting of Ownership Tag and UUID.
		See Section 3.2, "Asset Tracking and Security," for more information.

Continued

Computer Setup Menu Continued

Heading	Option	Description
Power	Energy Saver	Allows you to set energy saver mode to Advanced, Disabled, or Minimal.
		Note: In the minimal energy saver mode setting, the hard drive and system do not go into energy saver mode, but the setting allows you to press the power button to suspend the system.
		This option is not available under ACPI-enabled operating systems.
	Timeouts	Allows you to enable/disable timeouts or manually select timeout values.
		Note: This selection will appear only when energy saver mode is set to advanced. This option is not available under ACPI-enabled operating systems.
	Energy Saver Options	Allows you to set power button configuration (on/off or wakeup.)
		Allows user to enable/disable power LED blink in suspend mode.
		Note: This selection will appear only if the energy saver mode is enabled. This option is not available under ACPI-enabled operating systems.
Advanced*	Power-On Options	Allows you to set POST mode (QuickBoot or FullBoot every N days where n = 1 to 30) and enables/disables POST messages.
		Enables/disables POST messages, Safe Post, F10 prompt, F12 prompt, option ROM prompt, and UUID.
		Allows you to select the wakeup boot source (local hard drive or remote server).
		Allows you to select computer state after a power loss (On or Off)
	Onboard Devices	Allows you to set resources for onboard system devices (serial port, parallel port, diskette controller, 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.
	Bus Options	Enables/disables PCI bus mastering, PCI VGA palette snooping, PCI SERR# generation, 15 MB memory hole, and ECC on select models
		Allows you to set ISA back-to-back I/O (fast/legacy) delay and bus priority (ISA/PCI).

*These options should be used by advanced users only.

Continued

Computer Setup Menu Continued

Heading	Option	Description
Advanced* (continued)	Device Options	Allows you to set printer mode (EEP+ECP, Output only, bi-directional, and NumLock state at power-on.
		Enable/disable PME wakeup events, processor cache, processor number, ACPI thermal mode, and ACPI S3 support. (When ACPI S3 is enabled you may also enable/disable ACPI S# video repost and hard disk reset.)
		Allows you to select AGP aperture size (4, 8, 16, 32, 64, 128, or 256 MB)
	PCI VGA Configuration	Allows users to specify which VGA controller will be the "boot" or primary VGA controller.
		Appears only if there are multiple PCI video adapters in the system.

*These options should be used by advanced users only.

2.2 Computer Diagnostics

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

Compaq strongly recommends that you create a diagnostics diskette as soon as you begin to use the computer. This is a bootable diskette that allows you to test and inspect the hardware outside of the operating system by running the Computer Checkup (TEST) or View System Information (INSPECT) diagnostic programs. The diskette will play an important role in the restoration process if you ever experience a major system failure.

Another Compaq diagnostic feature is Compaq Diagnostics for Windows, described later in this guide.

2.2.1 Create a Diagnostics Diskette

DOS-Based

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

To create a bootable, DOS-based Diagnostic Diskette (some models may require two 1.44-MB diskettes) 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.

Windows-Based

Not all Compaq computers equipped with Windows NT support this feature.

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.

2.2.2 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.

✎ Third party devices not supported by Compaq may not be detected.

■ 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.

■ Reproduce the same environment on another computer for testing.

✎ Before you run TEST, you must create a diagnostics diskette. See Section 2.2.1, "Create a Diagnostics Diskette," for instructions.

1. Turn off the computer.

2. Disconnect all peripheral devices other than the keyboard and monitor. Do not disconnect the printer if you want to test it or use it to log error messages.

3. Install loop-back and terminating plugs to test external ports if desired.

4. Cold boot your computer from the diagnostics diskette you have created. Press Enter to bypass the title screen, if necessary.

5. Select Computer Checkup (TEST)

6. Select the option to view the device list. A list of the installed hardware devices appears.

7. Verify that TEST correctly detected the devices installed. This utility will detect all devices manufactured or supported by Compaq; devices from other manufacturers may not be detected.

   ❏ If the list is correct, select OK and go on to step 8.

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

8. 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. This option will only test the first 16-MB of memory.

   ❏ 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.

   ✎ If attended testing is selected, the test itself may result in data loss.

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

9. To exit TEST, press the Esc key to reach the Exit option. Then press Enter.

   ✎ Refer to Appendix J for a listing of the Diagnostic Error Codes.

2.2.3   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 INSPECT are similar to but may vary slightly from those available in Compaq Diagnostics for Windows.

✎ Before you run INSPECT, you must create a diagnostics diskette. See Section 2.2.1, "Create a Diagnostics Diskette," for instructions.

1. Cold boot your computer from the diagnostics diskette you have created. Press Enter to bypass the title screen, if necessary.

2. Select View System Information (INSPECT).

3. Select one of the available options using the Esc key:
   - ❏ Print the INSPECT status.
   - ❏ Save the INSPECT status to a file.
   - ❏ Add comments to a parameter status.
   - ❏ Exit the utility.

4. To exit INSPECT, press the Esc key to reach the Exit option. Then press Enter.

2.2.4   Compaq Diagnostics for Windows

Compaq Diagnostics for Windows 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 Diagnostics for Windows 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 Diagnostics for Windows

1. Select the Compaq Diagnostics for Windows icon, located in the Control Panel.

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

3. 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.

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

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

5. 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.

6. To exit Compaq Diagnostics for Windows, click File, then click Exit.

Running Diagnostic Tests

If your version of Compaq Diagnostics for Windows 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 Diagnostics for Windows, click File, then click Exit.

2.3   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 Deskpro Supplement CD* or the *Compaq Restore CD* which accompany many desktop and workstation models and enables the user to selectively restore the original system software.

2.3.1   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.

2.3.2   Compaq Restore CD

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

The *Compaq Restore CD* is specific to each desktop and workstation model and accompanies many computers along with the Microsoft operating system CD.

2.3.3   Compaq Restore CD for Windows NT

The *Compaq Restore CD for Windows NT* that is shipped with select Compaq Intel-based workstations is a set of Compaq-specific drivers that enables the workstation to operate at optimum performance. Updates are available on the Compaq Web site at www.compaq.com and through subscription to the Compaq Support Software CD Kit.

The *Compaq Restore CD for Windows NT* installation program automatically detects the components on the workstation and determines if the drivers (support software) need to be updated.

✎   When servicing the workstation, be sure it is running the latest version of the Compaq Restore CD for optimum performance. To determine the version of the Restore CD installed, look at the version in the file properties of the *SETUP.EXE* file in the \WINNT\SYSTEM32\CPQNTSSD workstation directory.

The CD has these capabilities:

- Remote capability—Allows the ability to install, remove, update, and configure components remotely by machine name (computer name). Supports distributed computing environments (DCE) perspectives.

- Silent Setup Command Line Interface—Provides the functionality of the Graphical User Interface (GUI) in a silent command line interface and provides execution output in a log file. Provides the ability to remotely install or update drivers on multiple remote machines at one time. Also useful for Microsoft Systems Management Server Configurations.

chapter 3

DESKTOP MANAGEMENT

Compaq pioneered intelligent manageability in 1995 with the introduction of the industry's first fully manageable desktop personal computers. Since then, Compaq has led an industry-wide effort to develop the standards and infrastructure required to effectively manage desktop PCs. Compaq Intelligent Manageability provides standards-based solutions for managing and controlling desktops in a networked environment. Compaq works closely with leading management software solution providers in the industry to ensure compatibility between Intelligent Manageability and these products. Desktop Management is an important aspect of our broad commitment to providing you with lifecycle management solutions and services to assist you with the four phases of the desktop PC lifecycle—planning, deployment, management, and transitions.

This chapter summarizes the capabilities and features of the four key components of Desktop Management:

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

The chapter also contains an overview of the tools, utilities, and information Compaq provides to help you successfully deploy manageable desktop PCs.

✎ Support for specific features described in this chapter may vary by model or software version.

3.1 Initial Configuration and Deployment

Compaq computers come with a preinstalled system software image. After a very brief software "unbundling" process, the Compaq Deskpro Personal Computer or Workstation is ready to be used.

You may prefer to replace the preinstalled software image with a customized set of system and application software. There are several methods for deploying a customized software image. They include:

- Installing additional software applications after unbundling the preinstalled software image

- Using software deployment tools, such as Microsoft MS Batch or NT Distribution Share (NTDS) to replace the preinstalled software with a customized software image

- Using a disk cloning process to copy the contents from one hard drive to another

The best deployment method depends on your information technology environment and processes. The PC Deployment section of the Deskpro Solutions and Services Web site (www.compaq.com/im/change) provides information to help you select the best deployment method. You'll also find guides and utilities to integrate with Microsoft or PXE-based deployment tools.

The Compaq Restore CD, ROM-based setup, and ACPI-ready hardware provide further assistance with recovery of system software, configuration management and troubleshooting, and power management.

3.1.1 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:

- Deploying a software image on one or more new PCs.

- Formatting a hard drive.

- Installing application software or drivers.

- Updating the operating system, 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.

Compaq and Altiris, Inc. have partnered to provide tools designed to make the task of corporate PC deployment and management easier and less time-consuming, ultimately lowering the total cost of ownership and making Compaq PCs the most manageable client PCs in the enterprise environment.

Altiris eXpress

Altiris eXpress allows the system administrator to create and quickly deploy a customized, corporate-standard software image across one or more networked client PCs with an interface as simple to use as Windows Explorer. Altiris eXpress supports Intel's Wired for Management and Preboot Execution Environment (PXE). Using Altiris eXpress and the Remote System Installation features of the Compaq computer, there is no need for the system administrator to visit each new PC individually to deploy the software image.

For more information, refer to the Compaq Web site at www.compaq.com/easydeploy

PC Transplant Pro and PC Transplant for Compaq

PC Transplant, designed to assist you in personalizing the new Compaq computer, can be downloaded free from the Compaq Web site. It lets you preserve the "personality"—the customized settings such as Start menu entries, drive and printer mappings, software application options, and so on—of an existing PC, then transfer those unique settings to a Compaq PC so that you don't have to invest valuable time manually recreating them.

For more information, refer to the Compaq Web site at www.compaq.com/easydeploy

3.2 Asset Tracking and Security

Compaq AssetControl features incorporated into the computer provide key asset tracking data that can be managed using Compaq Insight Manager products and Management Solutions Partners products. Seamless, automatic integration between AssetControl features and these 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 and Professional Workstations 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 components and information. Security features such as the Smart Cover Sensor and the Smart Cover Lock, available on select models, help to prevent unauthorized access to the internal components of the PC. By disabling parallel, serial, or USB ports, or by disabling removable media boot capability, you can protect valuable data assets. Memory Change and Smart Cover Sensor alerts can be automatically forwarded to Compaq Insight Manager products to deliver proactive notification of tampering with a computer's internal components.

There are three ways to manage security settings on your Compaq computers:

- Locally, using the Compaq Computer Setup Utilities. See the *Hardware Reference Guide* included with the computer for additional information.

- Remotely, using the Compaq Remote Security Management software. This software enables the secure, consistent deployment and control of security settings from a central point on the network using a third-party PC LAN management application such as Microsoft SMS.

- Remotely, using Compaq Insight Manager LC, a tool for managing PC workgroups.

The following table and sections refer to managing security features of your Computer locally through the Compaq Computer Setup Utilities. Refer to the Remote Management Setup Utilities for more information on using the Remote Security Management software. These utilities are available on the Support Software CD or from the Compaq Web site at www.compaq.com/support/files/index.html. For more information on Compaq Insight Manager LC, refer to www.compaq.com/im/lc.

Feature*	Purpose
Removable Media Boot Control	Prevents booting from 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.
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.
Smart Cover Lock	Prevents unauthorized access to internal components. This is a software-controllable cover lock, controlled by the setup password.
	✎ The Smart Cover FailSafe key is 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.
Master Boot Record Security	May prevent unintentional or malicious changes to the Master Boot Record of the current bootable disk, and provides a means of recovering the "last known good" MBR.
Memory Change Alerts	Detects when 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).
Kensington 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 Kensington cable lock to secure the computer to a fixed object.

For more information about Computer Setup**,** refer to Section 2.1, "Computer Setup Utilities." In some cases switches may need to be set. For more information about these switches, refer to the "Connectors, Jumpers, and Switches" chapter in the product-specific MSG.

*Not all features are available on all products.

3.2.1   Password Security

This computer supports two security password features—a setup password and a power-on password. The power-on password prevents unauthorized use of the computer by requiring entry of a password to access applications or data each time the computer is turned on or restarted. The setup password specifically prevents unauthorized access to Computer Setup, and can also be used as an override to the power-on password. That is, when prompted for the power-on password, entering the setup password instead will allow access to the computer.

A network-wide setup password can be established to enable the system administrator to log in to all network systems to perform maintenance without having to know the power-on password, even if one has been established.

Establishing a Setup Password Using Computer Setup

Establishing a setup-on 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

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 off 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

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

3. Press the Enter key.

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

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

   The power-on password and setup password may also be changed using the Security options in Computer Setup.

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:

3. current password/

4. Press the Enter key.

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

   The power-on password and setup password may also be changed using the Security options in Computer Setup.

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
é French Canadian	**-** 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 in the product-specific MSG for instructions on clearing passwords.

3.2.2 Smart Cover Sensor

Smart Cover Sensor, a feature on select computers, 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:

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

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.

3.2.3   Smart Cover Lock

The Smart Cover Lock is a software-controllable cover lock featured on some desktop 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

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

- Startup 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.

3.2.4   Master Boot Record Security

The Master Boot Record (MBR) contains information needed to successfully boot from a disk and to access the data stored on the disk. Master Boot Record Security may prevent unintentional or malicious changes to the MBR, such as those caused by some computer viruses or by the incorrect use of certain disk utilities. It also allows you to recover the "last known good" MBR, should changes to the MBR be detected when the system is restarted.

To enable MBR Security, 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 restart the computer to access the utility.

3. Select Security → Master Boot Record Security → Enabled.

4. Select Security → Save Master Boot Record.

5. Before exiting, click File → Save Changes and Exit.

When MBR Security is enabled, the BIOS prevents any changes being made to the MBR of the current bootable disk while in MS-DOS or Windows Safe Mode.

   ✎   Most operating systems control access to the MBR of the current bootable disk; the BIOS cannot prevent changes that may occur while the operating system is running.

Each time the computer is turned on or restarted, the BIOS compares the MBR of the current bootable disk to the previously-saved MBR. If changes are detected and if the current bootable disk is the same disk from which the MBR was previously saved, the following message is displayed:

   1999 - Master Boot Record has changed.

            Press any key to enter Setup to configure MBR Security

Upon entering Computer Setup, you must

■ Save the MBR of the current bootable disk;

■ Restore the previously-saved MBR; or,

■ Disable the MBR Security feature.

You must know the setup password, if one exists.

If changes are detected and if the current bootable disk is not the same disk from which the MBR was previously saved, the following message is displayed:

   2000 - Master Boot Record Hard Drive has changed.

            Press any key to enter Setup to configure MBR Security

Upon entering Computer Setup, you must

■ Save the MBR of the current bootable disk; or,

■ Disable the MBR Security feature.

You must know the setup password, if one exists.

In the unlikely event that the previously-saved MBR has been corrupted, the following message is displayed:

1998 - Master Boot Record has been lost.

Press any key to enter Setup to configure MBR Security

Upon entering Computer Setup, you must

- Save the MBR of the current bootable disk; or,

- Disable the MBR Security feature.

You must know the setup password, if one exists.

Before You Partition or Format the Current Bootable Disk

Ensure that MBR Security is disabled before you change partitioning or formatting of the current bootable disk. Some disk utilities, such as FDISK and FORMAT, attempt to update the MBR. If MBR Security is enabled when you change partitioning or formatting of the disk, you may receive error messages from the disk utility or a warning from MBR Security the next time the computer is turned on or restarted. To disable MBR Security, 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 restart the computer to access the utility.

3. Select Security → Master Boot Record Security → Disabled.

4. Before exiting, click File → Save Changes and Exit.

3.2.5 The Kensington Cable Lock Provision

The rear panel of the Computer accommodates a cable lock so that the Computer can be physically secured to a work area.

   ✎ The cable lock can be purchased from Kensington Microware Limited or from Compaq DirectPlus (www.directplus.compaq.com). Ask for the Kensington MicroSaver Security System, Model 64068.

3.2.6 Fingerprint Identification Technology

Eliminating the need to enter end-user passwords, Compaq Fingerprint Identification Technology tightens network security, simplifies the login process, and reduces the costs associated with managing corporate networks. Affordably priced and supported by Compaq computers, it isn't just for high-tech, high-security organizations anymore. See www.compaq.com/im/fit/index.html for more information.

3.3　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 the Compaq Management Agent. If the computer is connected to a network managed by Compaq Insight Manager LC, Compaq Insight Manager or other management products from Compaq Management Solutions Partners, the computer also sends a fault notice to the network management application.

3.3.1　Processor 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 you 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 products.

3.3.2　SMART Hard Drive Fault Prediction for IDE Drives

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 Management Agents.

3.3.3　Drive Protection System for IDE Drives

The Compaq Drive Protection System (DPS) is a diagnostic tool built into the hard drives installed in select Compaq products. DPS is designed to help diagnose problems that might result in unwarranted hard drive replacement. When Compaq products are built, each installed hard drive is tested using DPS and a permanent record of key information is written onto the drive. Each time DPS is run, test results are written to the hard drive. You can use this information to help diagnose conditions that caused you to run the DPS software.

3.3.4　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.

3.3.5   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 or RIMMs with ECC DIMMs or ECC RIMMs.

3.3.6   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.

3.3.7   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.

3.4   Software Updating and Management

Compaq provides several tools for managing and updating software on desktop computers— Altiris eXpress, Altiris PC Transplant Pro, PC Transplant for Compaq, Insight Manager LC, System Software Manager, and Remote Management Setup Utilities. Using Insight Manager LC, you can also monitor a workgroup of PCs from a central console and remotely update the system software, security settings, flash ROM, or hardware device drivers, for each of the managed PCs individually.

System Software Manager (SSM) is a utility that lets you update system-level software on multiple systems simultaneously. When executed on a PC client system, SSM detects both hardware and software versions, then updates the appropriate software from a central repository, also known as a file store. Support software that works with SSM is flagged with the PC Lifecycle Management icon on the Compaq Web site. To download the utility or to obtain more information on SSM, visit the Compaq Web site at http://www.compaq.com/im.

In addition to its PC configuration capabilities mentioned in a previous section, Altiris eXpress also includes easy to use software distribution capabilities. You can use Altiris eXpress to update operating systems and application software from a central console. When used in conjunction with SSM, Altiris eXpress can also update ROM BIOS and device driver software.

Finally, the Compaq Remote Management Setup Utilities, when integrated with Management Solutions Partners products, deliver an on-going management solution. These utilities supplement the capabilities of Solutions Partners products for distributing new applications, device drivers, and other system software. The Compaq Web site include 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 Setup Utilities, which are available on the Compaq Web site at www.compaq.com/support/files/index.html. The following sections provide information on using

these utilities to accomplish various remote management functions including ROM flash, changing security settings, and wakeup/shutdown.

3.4.1   Local ROM Flash

To upgrade the ROM:

1. Insert the ROMPaq diskette in the diskette drive and turn on the computer.

2. If prompted, enter the Setup Password.

   ✎   If the Setup password is entered correctly, the ROMPaq utility will take over and run the ROM upgrade. If the password is not entered correctly, the procedure will terminate and no changes will be made to the ROM.

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

   △   **CAUTION:** Do not turn off the power to the computer until the ROMPaq has completed the upgrade process.

   △   **CAUTION:** To guard against unauthorized updates to the ROM or the system BIOS, the Setup Password must be set. Refer to Section 3.2.1, "Password Security," for more information.

3.4.2   Remote ROM Flash

This 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 the ROM, you may:

■   Order an upgraded ROMPaq diskette from Compaq.

■   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. Compaq Insight Manager LC allows the system administrator to set the setup password on one or more PCs simultaneously.

Using Remote ROM Flash

Remote ROM Flash allows the system administrator to safely upgrade the ROM on remote Compaq Deskpro computers and Compaq Professional Workstations, 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 Compaq desktop ROM images over the network. It also results in greater productivity and lower total cost of ownership.

All desktop 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 computer to be restarted, in the unlikely event of an unsuccessful ROM flash.

   ✎   The 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.

3.4.3   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. The Flash Recovery diskette is a SoftPaq downloadable from the Compaq Website at www.compaq.com.

    ✎   The computer ships with the Diskette Boot feature enabled. If that feature is disabled, the FailSafe Boot Block ROM will override the disabled feature to accommodate a system ROM recovery in the event a system ROM failure occurs.

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 the 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.

    If no ROMPaq diskette is found, you will be prompted to insert one and restart the computer.

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	Caps Lock	Scroll Lock	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.

✎ Diagnostic lights do not flash on USB keyboards.
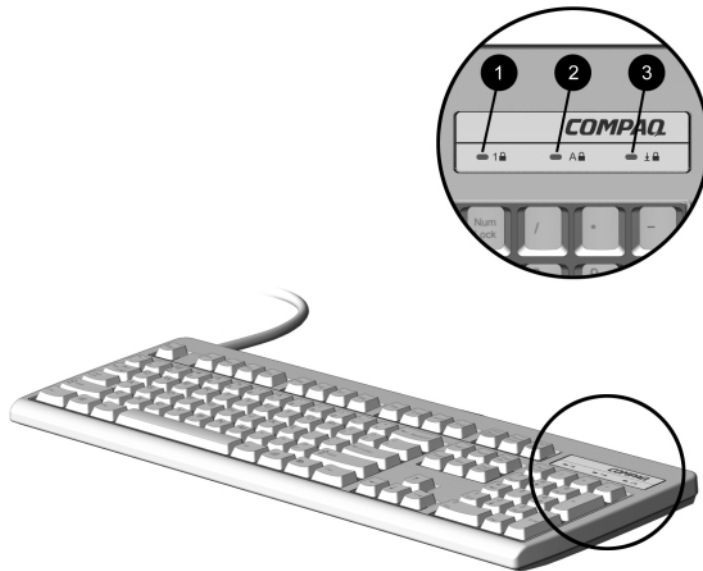
Keyboard Lights

3.4.4   Remote Security Management

Remote Security Management allows the system administrator to safely set or modify security features on remote Compaq desktops, 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 desktop security parameters over the network. It also results in greater productivity and lower total cost of ownership.

> ✎   The 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.

3.4.5   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.

3.4.6   NIC Alert

The NIC Alert function enables Compaq Deskpro computers to send an immediate alert to the network administrator when there is a hardware or operating system failure, or evidence of tampering, even if the system is powered off or the operating system is not yet loaded.

3.4.7　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 the setup:

1. Access the Computer Setup Utilities menu.

2. Click File → Save to Floppy. Follow the instructions on the screen.

   ✎　This requires an internal diskette drive, a MultiBay LS-120 drive, or a portable, external diskette drive.

3. To replicate the configuration, click File → Restore from Floppy, and follow the instructions on the screen.

3.4.8　Dual-State Power Button

With Advanced Power Management (APM) enabled in Windows 95 or Advanced Configuration and Power Interface (ACPI) enabled for Windows 98, and Windows 2000, 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.

   ✎　The power button suspend feature is not functional in Windows NT 4.0. Under windows NT, the power switch will act as a normal on/off button even if listed as "Suspend" in F10 Setup. If you attempt to place the system into the suspend mode, you could lose valuable data.

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

1. Access the Computer Setup menu.

2. Select Power → Energy Saver. Set the power button configuration to either Advanced or Minimal to turn on the Energy Saver Options menu.

3. Select Power→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 Section 2.1.1, "Using Computer Setup Utilities."

4. 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 second while the computer is in suspend. Refer to Section 2.1.1, "Using Computer Setup Utilities" for more information.

3.4.9 Power Management

Power Management is a feature that saves energy by shutting down certain components of the computer when they are not in use, saving energy without having to shut down the computer. Timeouts (the period of inactivity allowed before shutting down these components) can be enabled, customized, or disabled using Computer Setup.

1. Access the Computer Setup menu.

2. Select Power→Energy Saver. Select Advanced to turn on the Timeouts menu.

3. Select Power→Timeouts. Enable, customize, or disable timeouts.

    Refer to *Making Hardware Changes* for more detailed information about the features of Computer Setup.

4. Select File → Save Changes and Exit.

    ✎ To avoid potential conflicts, never enable monitor timeouts in Windows 95 or Windows 98 while system timeouts are enabled in Computer Setup.

    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.

3.4.10 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 a version of Microsoft Windows or Microsoft Windows NT Workstation that is different from the version included with your computer you must install corresponding Compaq device drivers and utilities to ensure all features are supported and functioning properly.

Compaq has made the task of locating, accessing, evaluating, and installing the latest support software easier. You can download the software from the Compaq World Wide Web site at www.compaq.com.

The Web site contains the latest device drivers, utilities, and flashable ROM images needed to run Windows 95, Windows 98, Windows 2000, and Windows NT Workstation on your Compaq computer.

3.5 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" (WfM), SNMP, and Net PC technologies. Microsoft, Intel, Hewlett-Packard, Novell, Veritas, Computer Associates, Tivoli, 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.

Compaq delivers desktop management solutions through the Compaq Management Solutions Partners Program. The partnership ensures that the benefits of Intelligent Manageability are accessible through a broad range of vendors. For more information and a list of Compaq Management Solutions Partners and their products, visit www.compaq.com/im/partners/index.html on the Compaq Web site.

3.5.1 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*.

3.5.2 Wired for Management

Intel's Wired for Management initiative is focused on reducing the support and administration cost of Intel architecture-based systems without compromising their flexibility and performance. The Wired for Management guidelines provide a baseline set of building blocks that Compaq utilizes in Intelligent Manageability to provide standardized management of desktop inventories, remote system configuration, off-hours maintenance, and next generation power management. But Compaq doesn't stop with these baseline features. Additional capabilities have been incorporated into Intelligent Manageability to provide an extensive solution for managing networked computing environments.

Required Wired for Management technologies include:

- Desktop Management Interface (DMI) 2.0

- Remote System Installation

- Remote Wakeup and Remote Shutdown

- ACPI-Ready Hardware

- SMBIOS

- Pre-boot execution (PXE) support

chapter 4

IDE/ATAPI DEVICE SEQUENCING GUIDELINES

This guideline standardizes the configuration of multiple IDE/ATAPI storage devices. It categorizes the devices by the type of media used and then ranks the device within each class.

Device Class

Class 1	Class 2	Class 3
Hard Drives	**Magnetic Storage**	**Optical Storage**
	2.1 LS-120	3.1 R/W CD-ROM Drive
	2.2 Tape Drive	3.2 DVD-ROM Drive
	2.3 Iomega Zip Drive	3.3 CD-ROM Drive

4.1 General Application Rules

1. When possible, hard drives should be configured by themselves on the primary controller channel.

2. When devices from all three classes are present, class 2 and 3 devices should be combined first on the secondary controller channel.

3. When combining two devices on any controller channel, the device with the lower rank should be the primary device (master) and the higher rank the secondary device (slave).

4. The lowest class present in a configuration consisting of four devices should be placed on the primary channel with the hard drive.

5. As new devices are developed and added to the individual class lists they will be added to the bottom of the lists. This improves the chances that the new device will be configured as a primary drive (master) and lowers the chances that it will be combined with a hard drive.

6. When two hard drives are installed in a computer, an 80-pin cable should be used. When other multiple ATAPI devices are used, a 40-pin cable is recommended.

4.2 Special Situations

1. When combined with the Iomega Zip drive on the same controller, the DVD drive must be configured as the primary drive.

2. In all applications except an NLX minitower chassis, when an LS-120 drive is being configured, it is assumed that the diskette drive is not present.

3. When a DVD drive using A50H firmware and an Iomega Zip drive are on the same controller, the DVD drive must be configured as the primary drive. When the DVD drive firmware is A53H, this configuration is not required.

4. DVD drives are supported on some computers that use the Intel 810 chipset. Refer to the specific documentation that came with the computer for applicability.

5. On all BX platforms, the LS-120 drive should be sequenced as the primary drive on the secondary channel and system board jumper P33 must be removed.

6. On all 810 platforms, the LS-120 should be sequenced as the primary drive on the secondary channel and system board jumper E23 must be removed.

chapter 5

SCSI GUIDELINES

When installing and operating SCSI devices, you must follow these guidelines:

■ A narrow SCSI controller allows you to daisy-chain up to 7 additional SCSI devices. Counting the controller, that amounts to 8 total SCSI devices.

■ A single Ultra SCSI, Ultra-Wide SCSI, or Wide-Ultra SCSI controller allows you to daisy-chain up to 15 additional SCSI devices. Counting the controller, that amounts to 16 total SCSI devices.

■ If two SCSI controllers are each connected to separate system board SCSI connectors, each controller may have seven SCSI devices attached. This will give a total of 16 SCSI devices on the system.

■ Compaq does not recommend mixing different width SCSI devices on the same SCSI chain or on the same SCSI controller. Mixing devices of different widths on the same chain or controller will always result in a data transfer rate of the slowest machine in that chain.

■ If two controllers are used, each may use SCSI devices having widths and speeds different from the other. If a 68-pin data cable is used on a controller having 50-pin SCSI devices, use an internal cable adapter (Compaq number 199618-001) or an external cable adapter (Compaq number 270187-B21).

> △ **CAUTION:** Do not route data cables near the air intake to the power supply. Cables routed in this manner may block the airflow and cause the computer to overheat.

■ The Ultra SCSI, Ultra-Wide SCSI, or Wide-Ultra SCSI controller requires a unique SCSI ID (0-7 or 8-15) for each SCSI device installed. The controller identifies a SCSI device by its SCSI ID number rather than its location. Moving a SCSI device from one position to another on the SCSI chain does not affect communication between the controller and the device. The reserved and available SCSI ID numbers for SCSI devices are:

  ❏ 0 is reserved for the primary hard drive.

  ❏ 7 is reserved for the SCSI conroller.

  ❏ 1 through 6 and 8 through 15 are available for all other SCSI devices.

■ Every SCSI chain or circuit must be terminated (closed) at both ends. Some system boards have both ends of the SCSI cable connected to, and terminated by, the system board. Termination can be accomplished in one of several ways:

  ❏ Use a cable with a built-in terminator.

  ❏ Use a cable with a terminating resistor plug in the last connector.

  ❏ Connect a SCSI device with its termination enabled into the last connector.

  ❏ Connect an external SCSI device with its termination enabled to the external SCSI connector on the rear panel of the computer.

- For workstations, if only one SCSI hard drive is used, it should be installed in the lowest numbered bay (bay 1). (Refer to the product-specific MSG for application).

- All SCSI hard drives must be either internal or external, but never both. The system accommodates a combination of other internal and external SCSI devices, such as tape and CD-ROM drives.

- Turn on all external SCSI devices before turning on the power to the computer. This enables the SCSI controller to recognize the external devices.

Using the Multi-Mode SCSI Cable

Some products ship standard with a three-device multi-mode SCSI cable having a terminator ❶ on one end. This cable supports both low voltage differential (LVD) and single ended (SE) devices. One end of the cable connects to the internal LVD/SE connector on the system board, while the remaining three connectors being used on the hard drives in the hard drive bays. The third device circuit must be used.
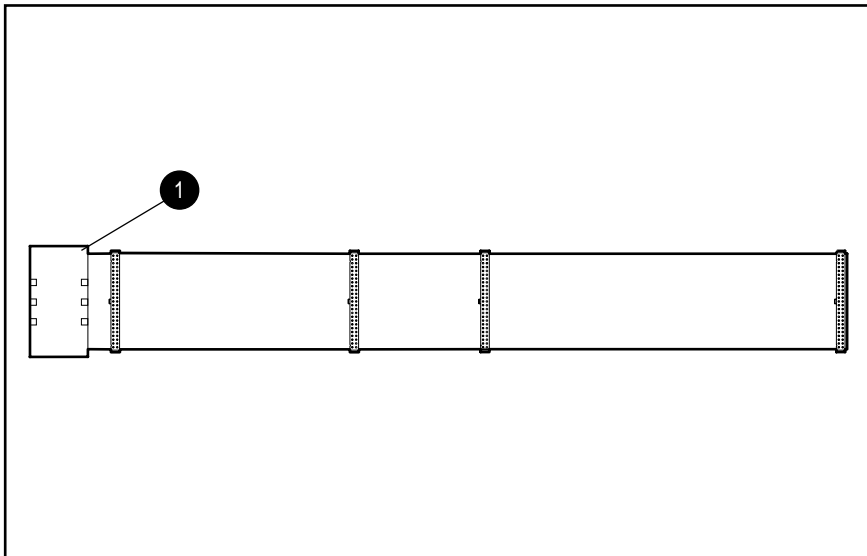
✎ The multi-mode cable included with the computer may differ from the one pictured.

For additional information about installing optional SCSI devices, refer to the documentation included with the device option kit.

appendix A

CONNECTOR PIN ASSIGNMENTS

This appendix contains the pin assignments for many computer and workstation connectors. Some of these connectors may not be used on the product being serviced.

Enhanced Keyboard

Connector and Icon	Pin	Signal
	1	Data
	2	Unused
	3	Ground
	4	+5 VDC
	5	Clock
	6	Unused
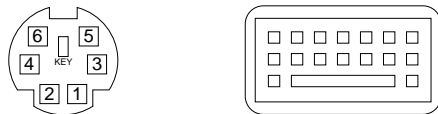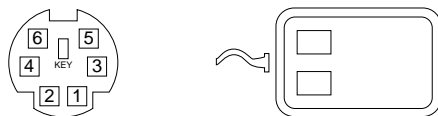
Mouse

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

Ethernet BNC

Connector and Icon	Pin	Signal
	1 (Inside)	Data
	2 (Outside)	Ground
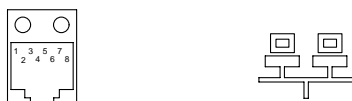
Ethernet RJ-45

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

Ethernet AUI

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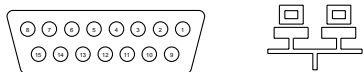
Pin	Signal
1	Ground
2	Negative AUI Differential Collision
3	Positive AUI Differential Collision
4	Negative AUI Differential Transmit
5	Positive AUI Differential Transmit
6	Ground
7	Ground
8	Negative AUI Differential Receive
9	Positive AUI Differential Receive
10	+12V
11	Ground
12	Ground
13	Not Used
14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

Parallel Interface

Connector and Icon
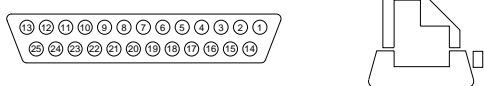
Pin	Signal
1	Strobe
2	Data Bit 0
3	Data Bit 1
4	Data Bit 2
5	Data Bit 3
6	Data Bit 4
7	Data Bit 5
8	Data Bit 6
9	Data Bit 7
10	Acknowledge
11	Busy
12	Paper End
13	Select
14	Auto Linefeed
15	Error
16	Initialize Printer
17	Select IN
18-25	Signal Ground
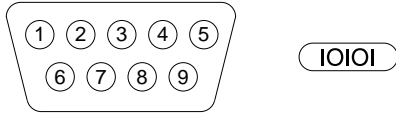
Serial Interface

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

USB

Connector and Icon

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

Microphone

Connector and Icon (1/8″ miniphone)
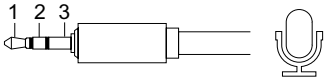
Pin	Signal
1 (Tip)	Audio
2 (Ring)	Power
3 (Shield)	Ground

Headphone

Connector and Icon (1/8″ miniphone)
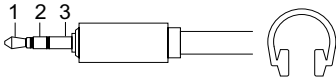
Pin	Signal
1 (Tip)	Audio_Left
2 (Ring)	Audio_Right
3 (Shield)	Ground

Line-In Audio
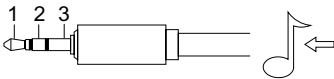
Connector and Icon (1/8″ miniphone)

Pin	Signal
1 (Tip)	Audio_In_Left
2 (Ring)	Audio_In_Right
3 (Shield)	Ground

Line-Out Audio

Connector and Icon (1/8″ miniphone)
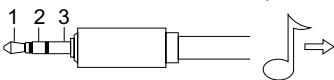
Pin	Signal
1 (Tip)	Audio_Out_Left
2 (Ring)	Audio_Out_Right
3 (Shield)	Ground

SCSI Low Voltage Differential/Single Ended (LVD/SE)

Connector and Icon
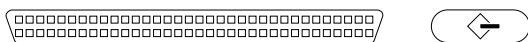
Pin	Signal	Pin	Signal	Pin	Signal
1-16	Ground	43	-D3	57	-BSY
17-18	TERMPWR	44	-D4	58	-ACK
19	Reserved	45	-D5	59	-RST
20-34	Ground	46	-D6	60	-MSG
35	-D12	47	-D7	61	-SEL
36	-D13	48	-DP0	62	-C/D
37	-D14	49-50	Ground	63	-REQ
38	-D15	51-52	TERMPW	64	-I/O
39	-DP1	53	Reserved	65	-D8
40	-D0	54	Ground	66	-D9
41	-D1	55	-ATN	67	-D10
42	-D2	56	Ground	68	-D11

Ultra SCSI

Connector and Icon

Pin	Signal	Pin	Signal	Pin	Signal
1-11	Ground	31	DB5	41	ATN #
12	Reserved	32	DB6	42	Ground
13	Open	33	DB7	43	BSY #
14	Reserved	34	DBP	44	ACK #
15-25	Ground	35	Ground	45	RST #
26	DB0	36	Ground	46	MSG #
27	DB1	37	Reserved	47	SEL #
28	DB2	38	TERMPWR	48	C/D
29	DB3	39	Reserved	49	REQ #
30	DB5	40	Ground	50	Input/Output

External Infrared Transceiver

Connector and Icon

Pin	Signal
1	Transmit
2	Receive
3	Ground
4	5V
5	Mode
6	Not Used
7	Not Used
8	Not used
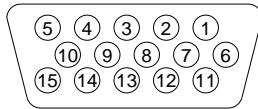
Monitor

Connector

Pin	Signal
1	Red Analog
2	Green Analog
3	Blue Analog
4	Monitor ID
5	Ground
6	Ground
7	Ground
8	Ground
9	+5V DC
10	Ground
11	Monitor ID
12	DDC Serial Data
13	Horizontal Sync
14	Vertical Sync
15	DDC Serial Clock

IDE/EIDE Drive Cable

Connector

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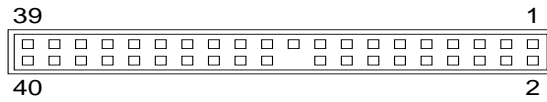
Pin	Signal	Pin	Signal	Pin	Signal
1	RESET	15	DD1	29	DMAK
2	GROUND	16	DD14	30	GROUND
3	DD7	17	DD0	31	INTRQ
4	DD8	18	DD15	32	IOCS16
5	DD6	19	GROUND	33	DA1
6	DD9	20	(KEY)	34	PDIAG (80-pin cable detect)
7	DD5	21	DMARQ	35	DA0
8	DD10	22	GROUND	36	DA2
9	DD4	23	DIOW	37	CS1FX
10	DD11	24	Ground	38	CS3FX
11	DD3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

Slimline CD-ROM Adapter

Connector
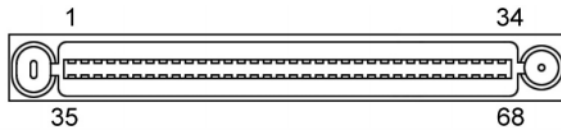
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	RESDRV_	18	D15	35	A0	52	FP05
2	GROUND	19	GROUND	36	A2	53	FP06
3	DO7	20	(KEY)	37	CS1FX	54	FP07
4	D08	21	DRQ	38	CS3FX	55	FP08
5	D06	22	GROUND	39	DASP	56	FP09
6	D09	23	IOW	40	GROUND	57	FP10
7	D05	24	GROUND	41	+5VMLOG	58	FP11
8	D10	25	IOR	42	+5VMOT	59	FP12
9	D04	26	GROUND	43	GROUND	60	FP13
10	D11	27	IOCHRDY	44	AUDIO_L	61	FP14
11	D03	28	CABLE SELECT	45	A_GROUND_R	62	FP15
12	D12	29	DAK	46	A_GROUND_L	63	FP16
13	D02	30	GROUND	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

Accelerated Graphics Port (AGP)

Connector

A1   A21 A26   A66

B1   B21 B26   B66
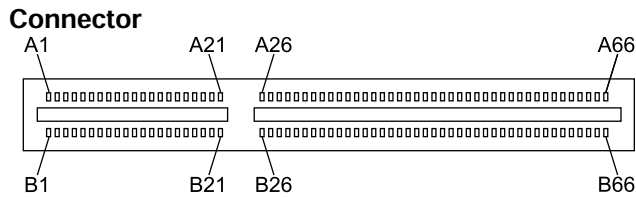
Pin	Signal A	Signal B	Pin	Signal A	Signal B	Pin	Signal A	Signal B
1	+12 V	OVRCNT#	23	Ground	Ground	45	VCC 3.3	VCC 3.3
2	TYPEDET#	+ 5V	24	Reserved	3.3 Vaux	46	TRDY#	DEVSEL#
3	Reserved	+ 5V	25	VCC 3.3	VCC 3.3	47	STOP#	Vddq
4	USB-	USB+	26	AD30	AD31	48	PME#	PERR#
5	Ground	Ground	27	AD28	AD29	49	Ground	Ground
6	INTA#	INTB#	28	VCC 3.3	VCC 3.3	50	PAR	SERR#
7	RST#	CLK	29	AD26	AD27	51	AD15	C/BE1#
8	GNT#	REQ#	30	AD24	AD25	52	Vddq	Vddq
9	VCC3.3	VCC3.3	31	Ground	Ground	53	AD13	AD14
10	ST1	ST0	32	AD_STB1#	AD_STB1	54	AD11	AD12
11	Reserved	ST2	33	C/BE3#	AD23	55	Ground	Ground
12	PIPE#	RBF#	34	Vddq	Vddq	56	AD9	AD10
13	Ground	Ground	35	AD22	AD21	57	C/BE0#	AD8
14	WBF#	Reserved	36	AD20	AD19	58	Vddq	Vddq
15	SBA1	SBA0	37	Ground	Ground	59	AD_STB0#	AD_STB0
16	VCC 3.3	VCC 3.3	38	AD18	AD17	60	AD6	AD7
17	SBA3	SBA2	39	AD16	C/BE2#	61	Ground	Ground
18	SB_STB#	SB_STB	40	Vddq	Vddq	62	AD4	AD5
19	Ground	Ground	41	FRAME#	IRDY#	63	AD2	AD3
20	SBA5	SBA4	42	Reserved	3.3VAux	64	Vddq	Vddq
21	SBA7	SBA6	43	Ground	Ground	65	AD0	AD1
22	Reserved	Reserved	44	Reserved	Reserved	66	VREFGC	VREFCG

Ultra SCSI

Connector and Icon

Pin	Signal	Pin	Signal	Pin	Signal
1-11	Ground	31	DB5	41	ATN #
12	Reserved	32	DB6	42	Ground
13	Open	33	DB7	43	BSY #
14	Reserved	34	DBP	44	ACK #
15-25	Ground	35	Ground	45	RST #
26	DB0	36	Ground	46	MSG #
27	DB1	37	Reserved	47	SEL #
28	DB2	38	TERMPWR	48	C/D
29	DB3	39	Reserved	49	REQ #
30	DB5	40	Ground	50	Input/Output

IDE CD-ROM

Connector
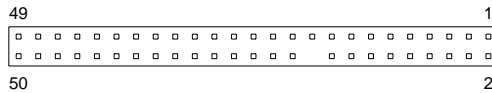
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	RESDRV_	14	GROUND	27	D07	40	D08
2	D06	15	D09	28	D05	41	D10
3	D04	16	D11	29	D03	42	D12
4	D02	17	D13	30	D01	43	D14
5	D00	18	D15	31	Ground	44	(KEY)
6	DREQ	19	Ground	32	IOW	45	Ground
7	IOR	20	Ground	33	OCHRDY	46	CABLE SELECT
8	DAK	21	Ground	34	IRQ	47	IO16
9	A1	22	PDIAG	35	A0	48	A2
10	CS1FX	23	CS3FX	36	DASP	48	Ground
11	AUDIO_R	24	AUDIO_L	37	A_GND_R	49	A_GND_L
12	+5VMOT1	25	+5VMOT2	38	+5VMOT3	50	+5VMOT4
13	+5VMLOG1	26	+5VMLOG2	39	DASP		

14-Pin Power

Connector for BX Chipset

```
 1              13
┌─────────────────┐
│ ▪ ▪ ▪ ▪ ▪ ▪ ▪ │
│ ▪ ▪ ▪ ▪ ▪ ▪ ▪ │
└─────────────────┘
 2              14
```
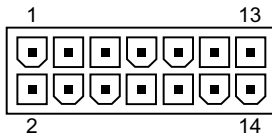
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3 V	5	RTN	9	-12 V	13	+3.3 V Sense return
2	+3.3 V Sense	6	+5 V	10	Fan OFF	14	+12 V
3	RTN	7	RTN	11	ON/STBY		
4	+5 V	8	+3.3 V	12	+5 V Aux		

14-Pin Power

Connector for 810, 810e, and 820 Chipsets

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 1              13
┌─────────────────┐
│ ▪ ▪ ▪ ▪ ▪ ▪ ▪ │
│ ▪ ▪ ▪ ▪ ▪ ▪ ▪ │
└─────────────────┘
 2              14
```
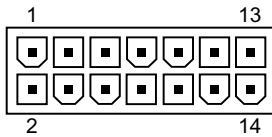
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3 V	5	RTN	9	-12 V	13	Fan speed
2	+3.3 V Aux	6	+5 V	10	Fan OFF#	14	+12 V
3	RTN	7	RTN	11	ON/STBY		
4	+5 V	8	+3.3 V	12	+5 V Aux		

20-Pin Power - Deskpro EP

Connector

```
 1                    19
┌───────────────────────┐
│ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ │
│ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ ▪ │
└───────────────────────┘
 2                    20
```
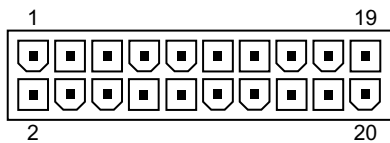
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3 V	6	+5 V	11	+3.3 V	16	RTN
2	+3.3 V	7	RTN	12	-12 V	17	RTN
3	RTN	8	Fan OFF	13	RTN	18	-5 V
4	+5 V	9	+5 V Aux	14	ON/STBY	19	+5 V
5	RTN	10	+12 V	15	RTN	20	+5 V

20-Pin Power - Deskpro EN

Connector

```
1                    19
┌─────────────────────┐
│ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ │
│ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ │
└─────────────────────┘
2                    20
```
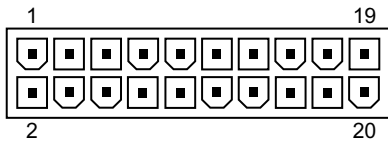
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	3 V	6	5 V	11	3 V	16	RTN/RS
2	3 V/RS	7	Aux RTN	12	-12 V	17	RTN
3	RTN	8	Fan OFF	13	RTN	18	-5 V
4	5 V	9	5 Vaux	14	ON/STBY	19	5 V
5	RTN	10	12 V	15	RTN	20	5 V

24-Pin Power

Connector

```
1                      23
┌───────────────────────┐
│ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ │
│ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ ■ │
└───────────────────────┘
2                      24
```
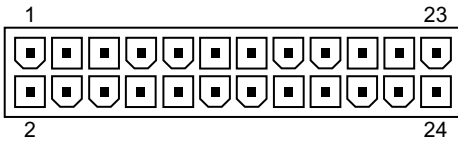
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	+3.3 V	7	aux RTN	13	+3.3V	19	RTN
2	+3.3 V	8	Fan OFF	14	-12 V	20	-5 V
3	RTN	9	+5 V aux	15	RTN	21	+5 V
4	+5 V	10	+12 V	16	ON/STBY	22	+5 V
5	RTN	11	3.3 Vaux	17	RTN	23	3.3 V R/S
6	+5 V	12	Fan CMD	18	RTN / (R/S)	24	Fan Sink

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

Additional requirements specific to a country are shown in parentheses and explained below.

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		

Notes:

(1) The flexible cord must be <HAR> Type HO5VV-F, 3-conductor, 1.0 mm^2 conductor size. Power cord set fittings (appliance coupler and wall plug) must bear the certification mark of the agency responsible for evaluation in the country where it will be used.

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

(3) The appliance coupler, flexible cord, and wall plug must bear a "T" mark and registration number in accordance with the Japanese Dentori Law. The flexible cord must be Type VCT or VCTF, 3-conductor, 0.75 mm^2 conductor size. The wall plug must be a two-pole grounding type with a Japanese Industrial Standard C8303 (15A, 125V) configuration.

appendix C

HARD DRIVES

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, and the other as the device 1 by the proper use of the drive jumpers. This designation is necessary because both drives cannot work simultaneously.

When the computer supports cable-select, the device 0/device 1 designations are determined by each drive's connector location on the data cable. Device 0 is attached to the data cable connector at the farthest distance from the system board while device 1 is attached to the connector closest to the system board. When only a single drive is used, the drive should be connected to the device 0 connector. The user must set each drive's jumpers to the cable-select setting for the computer to properly set the drive designation.

SMART

The SMART IDE and SCSI hard drives for the Compaq Deskpro Personal Computers and Workstations have built-in drive failure prediction that warns the user or the network administrator of an impending failure or crash of the hard drive. The SMART drives track fault prediction and failure indication parameters such as re-allocated sector count, spin retry count, and calibration retry count. If the drive determines that a failure is imminent, it generates a fault alert.

Device Cabling

Newer, Ultra ATA-66 (Ultra DMA-66) drives require 40-pin, 80-conductor cables to maintain the higher data transfer rates possible with the improved technology. The computer system must support Ultra ATA-66 logic for it to take advantage of the higher data transfer rates.

When using both Ultra ATA-66 and slower Ultra ATA-33 drives in the same system, the drives will operate at their respective data transfer rates.

Drive Capacities

The combination of the file system and the operating system used in the computer determines the maximum usable size of a drive partition. A drive partition is the largest segment of a drive that may be properly accessed by the operating system. A single hard drive may therefore be subdivided into a number of unique drive partition in order to make use of all of its space.

The table that follows identifies the capabilities and restrictions imposed on the computer by the combinations of file and operating systems.

Drive Partition Size

File System	Operating System	Maximum Partition Size
FAT 16	DOS/Windows 95	2 GB
FAT 16	Windows NT	4 GB
FAT 32		2 Terabytes
NTFS		2 Terabytes

For example, an 8-GB drive operating in a Windows 95 environment using FAT 16 would have a total of four 2-GB drive partitions. That same drive operating in Windows NT using FAT 16 would have two 4-GB drive partitions unless the user elected to subdivide it into smaller sections. The identical drive using FAT 32 would have a single 8-GB partition unless the user elected to subdivide it into smaller sections.

appendix *D*

POST ERROR MESSAGES

An error message results if the Power-On Self-Test (POST) encounters a problem. This test runs when the system is turned on, checking assemblies within the computer and reporting any errors found.

Screen Message	Beeps*	Probable Cause	Recommended Action
101-Option ROM Error	1L, 1S	System ROM checksum.	1. Verify the correct ROM. 2. Flash the ROM if needed. 3. If an expansion card was recently added, remove it and see if the problem remains. 4. Clear CMOS. 5. If the message disappears, there may be a problem with the expansion card. 6. Replace the system board.
102-System Board Failure	None	DMA, timers, etc.	1. Clear CMOS. 2. Remove expansion boards. 3. Replace the system board.
103-System Board Failure	None	DMA, timers, etc.	1. Clear CMOS. 2. Remove expansion boards. 3. Replace the system board.
150-SafePost Active	None	A PCI expansion card is not responding.	1. Restart the computer. 2. Disable SafePost. 3. If the expansion card does not respond, replace the card.
162-System Options Not Set	2S	Configuration incorrect. RTC (real-time clock) battery may need to be replaced. Battery life is approximately 3 years.	Run Computer Setup (F10 Setup) Set the date and time under Control Panel or in F10 Setup depending on the operating system. If the problem persists, replace the RTC battery.

* L = Long, S = Short

Continued

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
163-Time & Date Not Set	2S	Invalid time or date in configuration memory.	Set the date and time under Control Panel or in F10 Setup depending on the operating system.
		RTC (real-time clock) battery may need to be replaced. Battery life is approximately five years.	If the problem persists, replace the RTC battery.
		CMOS jumper may not be properly installed.	Check for proper placement of the CMOS jumper.
164-Memory Size Error	2S	Memory configuration is incorrect.	1. Run Computer Setup (F10 Setup) or Windows utilities.
			2. Make sure memory module(s) (if any) are installed properly.
			3. If third party memory has been added, test using Compaq-only memory.
			4. Verify proper memory module type.
183-Invalid Processor Jumper Setting	2S	System board jumper improperly set.	Reset system board jumpers to match processor and bus speeds.
201-Memory Error	None	RAM failure.	1. Run computer Setup (F10 Setup) or Windows utilities.
			2. Ensure memory and continuity modules are installed correctly.
			3. Verify proper memory module type.
			4. Remove and replace memory module(s) one at a time to isolate faulty module.
			5. Replace the faulty memory module(s).
			6. If error persists after replacing memory modules, replace the system board.
202-Memory Type Mismatch	None	Memory modules do not match each other.	Replace memory modules with matched sets.

* L = Long, S = Short   *Continued*

Screen Message	Beeps*	Probable Cause	Recommended Action
207-ECC Corrected Single Bit Errors in Memory Socket(s) y,y	2S	Single Bit ECC error.	1. Verify proper memory module type. 2. Try another memory socket. 3. Replace memory module if problem persists.
212-Failed Processor	None	Processor has failed to initialize.	1. Reseat the processor in its socket. 2. If the processor does not respond, replace it.
213-Incompatible memory Module in memory Socket(s) X,X, X	2S	A memory module in memory socket identified in the error message is missing critical SPD information, or is incompatible with the chipset.	1. Verify proper memory module type. 2. Try another memory socket. 3. Replace memory with a module conforming to the SPD standard.
214-Memory Device Failure. Error Code: XX Memory Module Socket(s):XX	None	A specific error has occurred in a RDRAM device installed in the identified socket.	1. Verify proper memory module type. 2. Try another memory socket. 3. Replace memory module if problem persists.
301-Keyboard Error	None	Keyboard failure.	1. Reconnect keyboard with computer turned off. 2. Check connector for bent or missing pins. 3. Ensure that none of the keys are depressed. 4. Replace keyboard.
304-Keyboard or System Unit Error	None	Keyboard failure.	1. Reconnect the keyboard with computer turned off. 2. Ensure that none of the keys are depressed. 3. Replace keyboard. 4. Replace system board.
401-Parallel Port 1 Address Assignment Conflict	2S	IRQ address conflicts with another device.	Reset the IRQ.

* L = Long, S = Short

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
403-Parallel Port 3 Address Assignment Conflict	2S	IRQ address conflicts with another device.	Reset the IRQ.
404-Parallel Port Address Conflict Detected	2S	Both external and internal ports are assigned to parallel port X.	1. Remove any parallel expansion cards. 2. Clear CMOS. 3. Reconfigure card resources and/or run Computer Setup (F10 Setup).
410-Audio Interrupt Conflict	2S	IRQ address conflicts with another device.	Reset the IRQ.
411-Network Interface Card Interrupt Conflict	2S	IRQ address conflicts with another device.	Reset the IRQ.
501-Display Adapter Failure	1L, 2S	Graphics display controller.	1. Reseat the graphics card (if applicable). 2. Clear CMOS. 3. Verify the monitor is attached and turned on. 4. Replace the graphics controller.
601-Diskette Controller Error	None	Diskette controller circuitry or floppy drive circuitry incorrect.	1. Run Computer Setup (F10 Setup). 2. Check and/or replace cables. 3. Clear CMOS. 4. Replace diskette drive. 5. Replace the system board.
602-Diskette Boot Record Error	None	Diskette in drive A not bootable.	Replace the diskette.
605-Diskette Drive Type Error	2S	Mismatch in drive type.	1. Run Computer Setup (F10 Setup) or Windows NT, Windows 95, or Windows 98 utilities. 2. Disconnect any other diskette controller devices (tape drives). 3. Clear CMOS.

* L = Long, S = Short

Continued

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
610-External Storage Device Failure	None	External tape drive not connected.	Reinstall tape drive or press F1 and allow system to reconfigure without the drive.
611-Primary Floppy Port Address Assignment Conflict	2S	Configuration error.	1. Run Computer Setup (F10 Setup). 2. Remove expansion cards. 3. Clear CMOS.
612-Secondary Floppy Port Address Assignment Conflict	2S	Configuration error.	1. Run Computer Setup (F10 Setup). 2. Remove expansion cards 3. Clear CMOS.
660-Display Cache is Detected Unreliable	None	Integrated video controller display cache not working properly and will be disabled.	Replace system board if minimal video degrading is an issue.
912-Computer Cover Has Been Removed Since Last System Start Up	None		No action required.
914-Hood Lock Coil is not Connected	None	Hood lock mechanism is missing or not connected.	1. Reconnect or replace hood locking mechanism. 2. Reseat or replace hood locking mechanism cable.
916-Thermal Sensor from Processor Heatsink is not Connected.	None	Processor Heatsink cable not connected to system board.	Reseat or replace the Processor Heatsink cable going to the system board.
917-Expansion Riser not Detected	None	Riser board not seated or not installed.	Install riser board if missing or remove and reseat to ensure good connection.
1151-Serial Port 1 Address Conflict Detected	2S	Both external and internal serial ports are assigned to COM1.	1. Remove any Comm port expansion cards. 2. Clear CMOS. 3. Reconfigure card resources and/or run Computer Setup (F10 Setup).Run Computer Setup or Windows utilities.

* L = Long, S = Short

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
1152-Serial Port 2 Address Conflict Detected	2S	Both external and internal serial ports are assigned to COM2.	1. Remove any Comm port expansion cards. 2. Clear CMOS. 3. Reconfigure card resources and/or run Computer Setup (F10 Setup).Run Computer Setup or Windows utilities.
1155- Serial Port Address Conflict Detected	2S	Both external and internal serial ports are assigned to same IRQ.	1. Remove any Comm port expansion cards. 2. Clear CMOS. 3. Reconfigure card resources and/or run Computer Setup (F10 Setup).Run Computer Setup or Windows utilities.
1201-System Audio Address Conflict Detected	2S	Device IRQ address conflicts with another device.	Reset the IRQ.
1202-MIDI Port Address Conflict Detected	2S	Device IRQ address conflicts with another device.	Reset the IRQ.
1203-Game Port Address Conflict Detected		Device IRQ address conflicts with another device.	Reset the IRQ.
1611- Fan failure detected	None	Chassis fan not connected to the system board.	1. Reconnect the fan. 2. Replace the fan. 3. Replace the system board.
1720-SMART Hard Drive Detects Imminent Failure	None	Hard drive is about to fail. (Some hard drives have a firmware patch that will fix an erroneous error message.)	1. Determine if hard drive is giving correct error message. Run the Drive Protection System test available. 2. Apply firmware patch if applicable. (See www. compaq.com\support\ techpubs\customer_advisories) 3. Back up contents and replace hard drive.
1721-SMART SCSI Hard Drive Detects Imminent Failure	None	Hard drive is about to fail. (Some hard drives have a firmware patch that will fix an erroneous error message.)	1. Determine if hard drive is giving correct error message. Run the Drive Protection System test available. 2. Apply firmware patch if applicable. 3. Back up contents and replace hard drive.

* L = Long, S = Short

Continued

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
1771-Primary Disk Port Address Assignment Conflict	2S	Internal and external hard drive controllers are both assigned to the primary address.	1. Remove any disk controller expansion cards. 2. Clear CMOS. 3. Reconfigure card resources and/or run Computer Setup (F10 Setup).
1772-Secondary Disk Port Address Assignment Conflict	2S	Internal and external hard drive controllers are both assigned to the primary address.	1. Remove any disk controller expansion cards. 2. Clear CMOS. 3. Reconfigure card resources and/or run Computer Setup (F10 Setup).
1780-Disk 0 Failure	None	Hard drive/format error.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cables/jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Run the Drive Protection System test if available. 7. Replace the hard drive.
1781-Disk 1 Failure	None	Hard drive/format error.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cable seating/jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Run the Drive Protection System test if available. 7. Replace the hard drive.

* L = Long, S = Short

Continued

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
1782-Disk Controller Failure	None	Hard drive circuitry error.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cable seating /jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Run the Drive Protection System test if available. 7. Check www.compaq.com\ suport\techpubs\ customer_advisories for possible changes when using Windows NT4.0 Service Pack 4. 8. Replace the hard drive. 9. Replace the system board.
1790-Disk 0 Failure	None	Hard drive error or wrong drive type.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cable seating /jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Confirm drive is supported on this computer (Large drive ROM support.) 7. Run the Drive Protection System test if available. 8. Replace the hard drive. 9. Replace the system board.

* L = Long, S = Short   *Continued*

Screen Message	Beeps*	Probable Cause	Recommended Action
1791-Disk 1 Failure	None	Hard drive error or wrong drive type.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cable seating /jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Confirm drive is supported on this computer (Large drive ROM support). 7. Run the Drive Protection System test if available. 8. Replace the hard drive. 9. Replace the system board.
1792-Secondary Disk Controller Failure	None	Hard drive circuitry error.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cable seating /jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Run the Drive Protection System test if available. 7. Replace the hard drive.
1793-Secondary Controller or Disk Failure	None	Hard drive circuitry error.	1. Run Computer Setup (F10 Setup). 2. Clear CMOS. 3. Check cable seating /jumper settings. 4. Run hard drive diagnostics. 5. Disconnect additional drives. 6. Run the Drive Protection System test if available. 7. Replace the hard drive.
1800-Temperature Alert	None	Internal temperature exceeds specification.	Check that computer air vents are not blocked and cooling fan is running. Verify processor speed selection. Replace the processor. Replace the system board.
1801-Microcode Patch Error	None	Processor not supported by ROM Bios.	Upgrade Bios to proper version.

* L = Long, S = Short

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
Audible	1L, 3S	System ROM is bad; system is running in Failsafe Boot Block mode.	Reflash the ROM using a ROMPaq diskette. Refer to the "Failsafe Boot Block ROM" section of the Software Reference Guide.
Audible	2S	Power-on successful.	None
Fixed Disk Parameter Table or BIOS Error System Halted	3L	Configuration or hardware failure.	Run Computer Setup and Diagnostic Utilities.
Flashing Caps Lock LED on Keyboard	1L, 2S	Graphics controller not present or incorrectly initialized.	1. Clear CMOS. 2. If graphics card has been added, remove and reseat. 3. Reset the riser board.
Flashing Num Lock LED on Keyboard	1S, 2L	System memory not present	1. Check memory module. 2. Remove and reseat memory module. 3. See "Memory Problems" in Appendix F.
Flashing Power and Hard Drive Green LEDs	None	Unseated riser board.	1. Remove riser board. 2. Wipe connector with a dry, clean cloth. 3. Reinstall riser board.
Flashing Scroll Lock LED on Keyboard	2L, 1S	System board hardware failure (prior to video)	Replace system board.
Green Power LED Blinks Once per Second	None	Computer in normal Suspend mode.	None
Green Power LED ON	None	Computer on.	None
Invalid Electronic Serial Number	None	Electronic serial number has become corrupted.	1. Run Computer Setup (F10 Setup). If Setup already has data in the field or will not allow the serial number to be entered, download and run SP5572.EXE (SNZERO.EXE). 2. Run F10 Setup and try to enter serial number under Security, System ID, then save changes.

* L = Long, S = Short

Continued

POST Error Messages Continued

Screen Message	Beeps*	Probable Cause	Recommended Action
Num Lock LED on Keyboard	None	Failed Boot Block.	Reflash the ROM using a ROMPaq diskette.
Red Power LED Blinks Every 2 or More Seconds	None	Power supply overloaded.	1. Push in power button. LED should be green. 2. Remove all AC power from computer, wait 30 seconds, then apply power. 3. Remove load from power supply by removing options one at a time until computer runs. 4. Check for damage to system board. 5. Replace system board. 6. Replace power supply.
Red Power LED Blinks Every Second	None	System memory error.	1. Check memory module. 2. Remove and reseat memory module. 3. See the "Solving Memory Problems" section of this guide.
Red power LED ON	None	Processor unseated.	Reseat processor in system board.
(Resume = F1 KEY)	None	As indicated to continue.	Press F1.
XXOOOYZZ Parity Check	None	Parity RAM failure.	Run Computer Setup and Diagnostic Utilities.

* L = Long, S = Short

appendix E

DIAGNOSTIC INDICATOR LIGHTS

✎   All indicator lights are not available on all products.

LED	Color	LED Activity	State/Message
Power	Green	On	Computer on
Power	Green	1 blink/second	Normal suspend mode
Power	Green	1 blink/second	Suspend to RAM
Power	None		Computer off
Power	Red	4 blinks/second	CPU thermal shutdown
Power	Red	On	CPU not installed/fetching code
Power	Red	1 blink/second	ROM error
Power	Red	1 blink/2 or more seconds	Power supply overloaded
Power and Hard Drive	Red	On	Riser board not seated
Num Lock	Green	Flashing	Memory error
Caps Lock	Green	Flashing	No video
Scroll Lock	Green	Flashing	System board failure, prior to video

appendix F

TROUBLESHOOTING WITHOUT DIAGNOSTICS

Preliminary Checklist

This section describes some simple, preliminary tests and guidelines for troubleshooting the computer without using the diagnostics.

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:

■ Are the computer and monitor connected to a working electrical outlet?

■ Is the computer turned on?

■ Is the green power light illuminated?

■ Is the monitor turned on?

■ Is the green monitor light illuminated?

■ Turn up the monitor brightness and contrast controls if the monitor is dim.

■ Press and hold any key. If the system beeps, then the keyboard should be operating correctly.

■ Check all cables for loose or incorrect connections.

■ Reconfigure the computer after installing a non Plug and Play expansion board or other option, such as a diskette drive.

■ Are all of the necessary device drivers installed?

■ Have all printer drivers been installed for each application?

■ Remove all diskettes from the diskette drives before you turn on the system.

■ Are all switches set correctly?

■ Is the NIC Remote Wakeup cable (featured on some models) connected between the NIC and the riser/system board?

■ Are all memory sockets filled on computers using RIMMs?

■ Ensure that memory module types are not mixed on the same system board. The system will not boot if RIMMs and DIMMs are mixed.

Solving Minor Problems

Problem	Possible Solution
Computer will not turn on.	1. Ensure that the computer is properly connected to an external power source and the wall outlet is active.
	2. A PCI or ISA card that has been installed is defective. Remove any expansion card that was just installed.
	3. Reseat drive power, data, and power supply cables.
	4. Disconnect all drive cables and reboot. Add devices back one at a time to isolate problem/
Computer appears locked up and won't turn off when the power button is pressed.	Software control of the power button may not be functional. Press and hold the button for four seconds, then release. This invokes the hardware override for the power button.
Computer date and time display is incorrect.	First, reset the date and time under Control Panel. If the problem persists, the real-time clock (RTC) battery may need to be replaced. Refer to the "Removal and Replacement Procedures" chapter in the product-specific MSG.
	When booting from a network, the PC clock may be reset to that of the server. The PC clock may also change when using other services through the server.
Computer powered off automatically.	1. The unit temperature was exceeded because the unit is in an exceedingly hot environment or the fan is blocked. Let the unit cool down.
	2. The fan may not be functioning correctly or the air vents are blocked.
	3. The unit temperature was exceeded because the computer was functioning with the cover or side panel removed. Replace cover or side panel, and let the computer cool down before turning power back on.
Insufficient power to the components.	Ensure that both power supply cables are connected to the system board (on some workstations).
Computer appears to pause periodically.	Network driver is loaded and no network connection is established. Establish a network connection, or use Computer Setup or Windows Device Manager to disable the network controller.
Cannot remove computer cover or side panel.	1. Smart Lock, featured on some computers, is locked. Unlock the Smart Cover Lock using Computer Setup.
	2. 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 cases of forgotten password, power loss, or computer malfunction.
Computer does not boot up and power and hard drive LEDs are blinking.	Ensure that the riser board is properly seated .
Computer does not boot up and Num Lock LED is blinking; you may hear one short and two long beeps.	Memory may be improperly installed or may be bad.

Continued

Solving Minor Problems Continued

| The Caps Lock LED is flashing; you may hear one long and two short beeps. | The video controller is not present or is incorrectly initialized. Clear configuration memory (CMOS). If a video card has been added, remove and reseat it. |
| Computer does not boot up and the Scroll Lock LED is flashing; you may hear two long and one short beeps. | System board hardware failure (prior to video). Replace system board. |

✎ If the standard keyboard has been replaced with a Universal Serial Bus (USB) keyboard, you will hear the beep sequences mentioned above but will not see the flashing lights.

Diskette Drive

Problem	**Possible Solution**
Diskette drive light stays on.	1. Diskette is damaged. In Windows 95 or 98, run ScanDisk. Click Start → Programs → Accessories → System Tools → ScanDisk. In Windows NT, right click Start, click Explore, and select a drive. Select File → Properties → Tools. Under Error-checking, click Check Now. 2. Diskette is incorrectly inserted. 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. 5. Diskette write control is enabled. Check the Removable Media write settings in Computer Setup.
Cannot format diskette.	Invalid media reported. When formatting a diskette in DOS, you may need to specify diskette capacity. For example, to format a 1.44-MB diskette, type the following command at the DOS prompt: FORMAT A:/F:1440
Diskette drive cannot read a diskette.	1. Diskette is not formatted. Format the diskette. 2. Using the wrong diskette type for the drive type. Check the drive type and use a compatible diskette. 3. Reading the wrong drive. Check the drive letter in the path statement. 4. Diskette drive has been disabled by Computer Setup, Windows NT, Windows 95, or Windows 98 utilities. Run Computer Setup and enable the diskette drive.

Continued

Diskette Drive Continued

A problem has occurred with a disk transaction.	The directory structure is bad, or there is a problem with a file. In Windows 95 or 98, run ScanDisk. Click Start → Programs → Accessories → System Tools → ScanDisk.
	In Windows NT, right click Start, click Explore, and select a drive. Select File → Properties → Tools. Under Error-checking, click Check Now.
Non-system disk message.	The system is trying to start from a nonsystem diskette. Remove the diskette from the drive.
Drive not found.	1. Reseat the diskette drive cable.
	2. If a second diskette drive has been installed, follow the computer reconfiguration directions in the "Hardware Installation Problems" section.
System has misidentified the diskette drive type.	If a diskette drive other than a 3.5-inch, 1.44-MB drive has been installed, ensure that the drive type is identified correctly under Computer Setup.

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. The cable connections are not correct. Check the cable connection from the monitor to the computer and to the electrical outlet.
	4. The brightness need adjusting. Adjust the brightness control.
	5. The energy saver feature has been enabled. Press any key or click the mouse button and, if one has been set, type the password.
	6. The RGB (Red, Green, Blue) input switch on the back of the monitor is incorrectly set. Set the monitor's input switch to 75 ohms and, if there is a sync switch, set it to External.
	7. System ROM is bad and system is running in FailSafe Boot Block mode (indicated by one long beep and three short beeps). Reflash the ROM using a ROMPaq diskette. Refer to "FailSafe Boot Block ROM" in section 3.4.1 of this book.
	8. If a fixed-sync monitor is used, be sure that the monitor can accept the same sweep rate as the resolution chosen.
	9. Ensure the VGA/BNC selector is properly set.
Graphics colors are wrong.	Either the cabling or the monitor impedance is incorrect.
	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.

Continued

Display Continued

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 features.
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.
The picture is broken up; it rolls, jitters, or blinks.	1. Be sure the monitor cable is securely connected to the computer.
	2. In a two-monitor system or if another monitor is in close proximity, move the monitors apart to be sure they are not interfering with one other's magnetic field.
	3. Fluorescent lights or fans may be too close to the monitor.
Screen goes blank.	A screen blanking utility may be installed or energy saver features may be 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. Be sure there is nothing on top of the monitor obstructing the air flow.
Cursor will not move using the arrow keys on the numeric keypad.	The Num Lock key is on. Press the key to turn it off. The Num Lock light should not be on when you want to use the arrow keys.

SCSI

Problem	**Possible Solution**
System with IDE and SCSI drives will not boot from SCSI hard drive.	The IDE drive needs to be disabled. Under the Computer Setup Advanced menu, disable the primary IDE controller.
System will not boot from a SCSI drive.	1. The SCSI drive is not configured correctly.
	2. Ensure that drive cabling and jumpers are set correctly. To boot a SCSI drive, the drive ID number must be set to 0.

Printer

Problem	Possible Solution
Printer will not print.	1. Printer is not turned on and online. Turn the printer on and ensure it is online.
	2. Run printer self-test.
	3. Reseat both ends of the printer cable.
	4. Verify that printer port is enabled in BIOS and in Windows using F10 Setup.
	5. Try printing using the DOS command C:\ [printer port]. Where [printer port] is the port address to which the printer is connected. If printer works, problem is with the printer driver. Reload driver.
	6. If the computer is on a network, you may not have made the connection to the printer. Make the proper network connections to the printer.
Printer will not turn on.	The cables may not be connected properly. Reconnect all cables and check the power cord and electrical outlet.
Prints garbled information.	1. The correct printer drivers for the application are not installed. Install the correct printer driver for the application.
	2. The cables may not be connected properly. Reconnect all cables.
Printer is offline.	The printer may be out of paper. Check the paper tray and refill it if empty. Select online.

Hard Drive

The information provided by the diagnostics tests 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.	Either the directory structure is bad or there is a problem with a file. In Windows 95 and 98, run ScanDisk. Click Start → Programs → Accessories → System Tools → ScanDisk.
	In Windows NT, right click Start, click Explore, and select a drive. Select File → Properties → Tools. Under Error-checking, click Check Now.
Drive not found (identified).	1. Cable could be loose. Check cable connections.
	2. The system may not have automatically recognized a newly installed device. See reconfiguration directions in the "Hardware Installation Problems" section. If system still does not recognize the new device, check to see if the device is listed within Computer Setup. If it is listed, the probable cause is a driver problem. If it is not listed, the probable cause is a hardware problem.
	3. Check drive jumper settings. 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.
	4. Check SCSI IDs to ensure none are duplicated.
Nonsystem disk message.	1. The system is trying to start from a diskette that is not bootable. Remove the diskette from the diskette drive.
	2. The system is trying to start from the hard drive but the hard drive may have 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.
Second Ultra ATA hard drive does not perform optimally.	The cable is not compatible with the drive type. Reinstall the second Ultra ATA hard drive using an 80-conductor cable.

Hardware Installation

You may need to reconfigure the computer when you add or remove hardware, such as an additional diskette drive. If you install a Plug and Play device, Windows 95 and 98 in most cases will automatically recognize the device and configures the computer. If a third-party Plug and Play device is not recognized, contact the device manufacturer. If you install a non-Plug and Play device, you must reconfigure the computer after completing installation of the new hardware. In Windows 95 and 98, select the Add New Hardware icon in the Control Panel and follow the instructions that appear on the screen. To reconfigure the computer in Windows NT Workstation 4.0 after installing new hardware, use the utility provided with the hardware.

Problem	Possible Solutions
A new device is not automatically recognized as part of the computer system.	1. The computer needs to be reconfigured to recognize the new device. Follow the reconfiguration instructions above. If system still does not recognize the new device, but the device is listed within Computer Setup, use Computer Setup to address any resource conflicts.
	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. A Plug and Play board may not automatically configure when added if the default configuration conflicts with other devices. Use Windows 95 or 98 Device Manager to deselect the automatic settings for the board and choose a basic configuration that doesn't cause a resource conflict. You can also use Computer Setup to reconfigure or disable devices to resolve the resource conflict.
	4. The cables for the new external device are loose or the power cables are unplugged. Check all cables, and check that pins in the cable or connector are not bent down.
	5. The power switch for the new external device is not turned on. Turn off the computer, turn on the external device, and then turn the computer on to integrate the new device with the computer.
	6. 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.
Insufficient power to the components.	Ensure both power supply cables are connected to the system board. (some Workstations)
Installed third-party SCSI hard drive adapter not participating in the hard drive ordering sequence provided in F10 Setup and/or is always coming up as the boot device regardless of the predetermined sequence.	The third-part adapter is either not supporting BIOS Boot Specification or the Boot Vector option. A solution is not available.

DVD- and CD-ROM

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 or DVD drive.	1. The CD-ROM or DVD boot is not enabled through the Computer Setup utility. Run the Computer Setup utility and set the drive priorities. 2. Ensure that drive cabling and jumpers are set correctly. To boot a SCSI drive, the drive ID number must be set to 0.
Cannot eject compact disc (tray-load unit).	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.
Cannot eject compact disc (slot-load unit).	1. Remove the drive from the chassis. 2. Remove the front bezel from the drive. 3. Remove the top and bottom drive covers. 4. Release the clamping mechanism to retrieve the CD.
CD-ROM or DVD device is not detected; driver is not loaded.	CD-ROM or DVD drive is not connected properly or not properly terminated. Open the computer and check the drive cable.
Movie will not play in the DVD drive.	Movie may be regionalized for a different country. Refer to the documentation that came with the device.

Memory

Problem	Possible Solution
System won't boot or does not function properly after installing additional memory modules	Memory module is not the correct type or speed grade for the system. Replace module with the correct industry-standard device for the computer.
Out of Memory error.	1. Memory configuration may not be set up correctly; check memory configuration using Device Manager. 2. The computer has run out of memory for the application. Check the application documentation to determine the memory requirements.
Memory count during POST is wrong.	Memory modules may not have been installed correctly or incorrect modules may have been used.
Insufficient memory error during operation.	1. Too many Terminate and Stay Resident programs (TSRs) are installed. Delete any unnecessary TSRs. 2. There is not enough memory for the application. Check the memory requirements for the application or add more memory.
Unit is on but there is no video and the power LED is blinking red.	Memory is not installed correctly and system is not booting. Reinstall memory modules.

Network

Some common causes and solutions for network problems are listed in the following table. These guidelines do not discuss the process of debugging network cabling.

Problem	Possible Solution
The Remote Wakeup feature is not functioning.	1. The feature is not available when using an AUI network connection; use an RJ-45 network connection. 2. Remote Wakeup is not enabled. Use the network control application to enable Remote Wakeup.
Network driver does not detect network controller.	Network controller is disabled. Run Computer Setup and enable network controller.
Network status link light does not turn on or flashes.	1. No active network is detected. Check cabling and network equipment for proper connection. 2. Network connection is not set up properly. Use the network control application to verify that the device is working properly. 3. System is configured for AUI connection; link LED does not apply to AUI connections. 4. Network driver is not properly loaded. Reinstall network drivers. 5. System cannot autosense the network. Disable autosensing capabilities and force the system into the correct operating mode.
Diagnostics reports a failure.	Refer to www.compaq.com\support\files for the latest version of diagnostics. 1. The cable is not securely connected or is attached incorrectly. 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. 2. 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. 3. The network controller is defective. Replace the controller or the system board. 4. Network controller interrupt is shared with an expansion board. Under the Computer Setup Advanced menu, change the resource settings for the board.
Diagnostics passes, but the computer does not communicate with the network.	1. Network drivers are not loaded, or driver parameters do not match current configuration. Make sure the network drivers are loaded and the driver parameters match the configuration of the network controller. 2. The network controller is not configured for this computer. In Windows 95, 98, or Windows NT, select the Network icon at the Control Panel. 3. Network controller interrupt with an expansion board. Under the Computer Setup Advanced menu, change the resource settings for the board.

Continued

Network Problem Continued

Problem	Possible Solution
Network controller stopped working when an expansion board was added to the computer.	1. Network drivers are not loaded or driver parameters do not match the current configuration. Make sure that the drivers are loaded and that the driver parameters match the configuration of the network controller.
	2. The cable is not securely connected or is attached incorrectly. Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	3. Network controller interrupt is shared with an expansion board. Under the Computer Setup Advanced menu, change the resource settings for the board.
	4. Network drivers were accidentally deleted when the drivers for the new expansion board were installed, or the files containing the network drivers are corrupted. Reinstall the network drivers, using backup diskettes.
Network controller stopped working without apparent cause.	1. The files containing the network drivers are corrupted. Reinstall the network drivers, using backup diskettes or the Compaq Restore CD.
	2. The cable is not securely connected or is attached incorrectly. Ensure that the cable is securely attached to the network connector and that the other end of the cable is securely attached to the correct device.
	3. The network controller is defective. Replace the network controller or system board.
Cannot connect to the network server when attempting Remote System Installation.	The network controller is not configured properly. Run Computer Setup and modify the Embedded NIC Settings.
System Setup utility reports unprogrammed EPROM.	1. Boot the workstation without the network drivers using a system boot diskette and reconfigure the controller.
	2. Replace the controller.
	3. Replace the 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 I/O address	388-38Bh
Interrupt	IRQ 5
8-bit DMA	Channel 1

To resolve hardware conflicts:

1. Change the hardware settings of your audio card or the peripheral card in your system if the peripheral card is using the audio interface setting. You can change settings for integrated audio using Computer Setup.

2. If you are unsure of the settings of the peripheral cards, you can isolate the source of the problem by temporarily removing all 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.

Problem	Possible Solution
Sound does not come out of the speaker.	Software volume control is turned down electronically, or CD-ROM volume control on the front or back of the computer is turned down.
	Double click on the speaker icon located on the taskbar, then set the volume by adjusting the volume slider.

Troubleshooting Using Compaq Intelligent Manageability Features

The Local Alert Pop-Up Dialog notifies you of an impending or actual hardware failure. If the computer is connected to a network and the Compaq Insight Management Agents are installed and configured, an Simple Network Management Protocol (SNMP) trap (message) is sent to the specified SNMP-compliant management application.

The Local Alert Pop-Up Dialog also tells you the steps you need to take prior to a hardware failure to avoid loss of data and damage to the computer. The system administrator can create a customized action message that might include contact telephone or pager numbers.

To close the Local Alert Pop-Up Dialog, click the Close button. To retrieve fault information after closing the dialog, run Compaq Insight Personal Edition.

For more detailed information, refer to the online *Intelligent Manageability Guide*.

appendix G

SYSTEM BOARD AND RISER BOARD REFERENCE DESIGNATORS

Designator	Component
E49	Clear Password header
E50	CMOS header
E51	Video pass through header
J6	BNC
J7	RJ-45 Jack
J8	IEEE 1394
J10 - 19	ISA slots
J20 -29	PCI slots
J30	Riser board socket
J31 - J35	Device bay connectors
J36	AC97 connector
J40	AGP slot
J50	First parallel port
J51	Second parallel port
J52	Double-stacked parallel port Top Port B Bottom Port A
J66	Keyboard connector (Closest to monitor connector)
J67	Mouse connector
J68	Double-stacked mouse/keyboard connector Top Mouse Bottom Keyboard
J69	Video connector
J70	Single USB connector
J71	Double-stacked USB Top Port 1 Bottom Port 2
J72	Microphone jack
J73	Line-in jack
J74	Line-out jack
J75	Headphone jack
J76	Volume control

Continued

Designator	Component
J77	Double-stacked headphone/microphone connector Top Microphone Bottom Headphone
J78	Double-stacked line-in/line-out connector Top Line in Bottom Line out
J80	Stacked serial/audio connetor
J81	Primary double stack USB Top Port 2 Bottom Port 1
J82	Secondary double stack USB Top Port 4 Bottom Port 3
P1	P/S connector
P2	Second P/S connector (as required)
P3	Third P/S connector (as required)
P5	Main Power switch and HDD and power LED connector (pins 1-9) and SCSI LED connector (pins 10-11)
P6	Speaker connector
P7	Audio connector (from CD-ROM)
P8	Chassis fan connector
P9	WOL connector (NIC cable)
P10	Diskette drive connector
P11	Second Audio connector
P12	Alert on LAN NIC connector
P15	AUI connector
P20	Primary IDE connector
P21	Secondary IDE connector
P22	Slimline CD-ROM connector
P25 - P26	Video memory upgrade connector
P29	SCSI LED connector
P30	Primary SCSI connector
P31	Secondary SCSI connector
P53	First serial port
P54	Second serial port
P55	Double stack serial port Top Serial B Bottom Serial A
P58	Riser edge connector (male-mates with J30)
P70	Processor (CPU) fan header for fansink
P89	Floating serial port /COM port header

Continued

Reference Designators Continued

Designator	Component
P100	ITP connector
P216	White box chassis fan
SW1	Processor speed switch
SW2	Security hood switch
SW50	Clear CMOS switch
XBT1	Battery socket
XMM1	Memory slot. The first slot populated (DIMM1 or RIMM1) and tested.
XMM2 - XMM5	Following memory slots
XU1	Primary processor socket
XU2	Secondary processor socket
XU15	ROM socket

appendix H

MODEL NUMBER NAMING FOR COMPAQ PRODUCTS

Compaq Deskpro Series of Personal Computers

Slash exists only when number
of characters permits use

END/P933/10a/6/128cvmB

Product
Line
**EN, EP,
EC, EX**

Form Factor
blank, a, and **C** -
    Convertible
    Minitower
D - Desktop
L - Slim Desktop
M - Minitower
S - Small Form
    Factor

Processor Type
C - Celeron
P - Pentium

Processor
Speed,
MHz

Hard Drive
Capacity,
GB

Operating
System
2 - Win 2000
4 - Win NT 4.0
5 - Win 95
6 - **2+4**
8 - Win 98
9 - **5+8**

Chipset
blank - BX
a - 810
b - 810e
c - 815
d - 820
e - 815e

Memory,
MB RAM

Removable
Storage
blank - none
b - **c+r**
c - CD-ROM
d - DVD
r - CDRW
z - ZIP

Graphics
blank -
integrated
a - AIMM
v - nVidia

Nic/Modem
n - NIC
m - modem

SMB Software
B - Office 2000
    Small Business
F - Office 2000
    Professional
P - Office 2000
    Premium
W - MS Word
S - Office 2000
    Personal

Compaq Professional Workstations

Processors 600 MHz and Lower

55/600EB/128R6/18L/3M

1st two digits of product name

Processor Speed =/< 600 MHz

Memory, MB RAM

Processor Type**
B - P III/133 MHz
E - P III/100 MHz
EB - PIII/133
X - PIII Xeon
blank - PIII/100 MHz

Memory Type
R - Rambus
S - SDRAM

Memory Speed
6 - 600 MHz
7 - 700 MHz
8 - 800 MHz

Notes: **
Processor speeds 650 MHz and faster will not have letter designations.
B - 133 MHz system bus
E - Advanced Transfer Cache

Graphics
2 - 2D
2+ - 2D/3D
3M - Mid 3D
3E - Enh. 3D
2X - multi 2 port
4X - multi 4 port
X - no graphics

Hard Drive Capacity and Type
18 - 18.0 GB
A - UATA
L - Ultra2 or Ultra3 SCSI (LVD drive)
S - SCSI

Processors 650 MHz and Greater

55/1.0/256R8/18L/3M/N

1st two digits of product name	
Processor Speed =/> 650 MHz	
Memory, MB RAM	
Memory Type **R** - Rambus **S** - SDRAM	

Memory Speed
6 - 600 MHz
7 - 700 MHz
8 - 800 MHz

Graphics
2 - 2D
2+ - 2D/3D
3M - Mid 3D
3E - Enh. 3D
2X - multi 2 port
4X - multi 4 port
X - no graphics

Hard Drive Capacity and Type
18 - 18.0 GB
A - UATA
L - Ultra2 or Ultra3 SCSI (LVD drive)
S - SCSI

Operating System
N - Win NT 4.0
W - Win 2000

Notes: **
Processor speeds 650 MHz and faster will not have letter designations.
B - 133 MHz system bus
E - Advanced Transfer Cache

appendix J

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.

Diagnostic error messages consist of three components, AABB-CC, where

AA = Device Code

BB = Subtest Code

CC = Error Code

The following table lists the device codes (<u>AA</u>BB-CC) and the subtest code (AA<u>BB</u>-CC) covered by Compaq Diagnostics Tests. Some codes listed in this table 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 Code Range	Device Description	Error Code Range	Device Description
0100 - 0199	Processor (P1)	3113 - 3199	Third Processor (P3)
0200 - 0210	Memory	3206 - 3206	Audio System
0301 - 0304	Keyboard	3300 - 3333	Mediavision Spectrum 16 Multimedia
0401 - 0498	Parallel Port	3400 - 3401	TV Tuner Card
0501 - 0516	Video Display Unit	4113 - 4199	Fourth Processor
0600 - 0699	Diskette Drive	5100 - 5130	Plasma Display System
0802 - 0824	Monochrome Video Card	5234 - 5240	Advanced Color Graphics (AGC)
1101 - 1109	Serial Port	6000 - 6089	Network Card
1201 - 1210	Modem	6500 - 6599	SCSI Hard Drives
1700 - 1799	Hard Drive	6600 - 6699	CD-ROM Drives
1800 - 1823	CD-ROM	6700 - 6799	SCSI Tape Drives
1900 - 1906	Tape Drive	7000	Server Manager/R Card
2113 - 2199	Second Processor (P2)	8601	Auxiliary Input Interface
2402 - 2480	Enhanced Color Graphics (ECG/VGA)	8700 - 8702	Game Port
2502 - 2502	Pen/Digitizer		

The remaining tables list possible error codes (AABB-<u>CC</u>), descriptions of each error condition, and recommended actions 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 the "Removal and Replacement Procedures" chapter in the product-specific MSG.

Microprocessor

Error Code	Description	Recommended Action
0101-xx	CPU test failed.	The following steps apply to 0101-xx through 0102-xx:
0102-xx	Coprocessor error.	1. Run Computer Checkup or Computer Setup and retest.
		2. Replace processor and retest.
		3. Replace the system board and retest.
0103-xx	DMA controller failed.	The following step applies to 0103-xx through 0106-xx:
0104-xx	Interrupt controller failed.	Replace the system board and retest.
0105-xx	Port error.	
0106-xx	Keyboard controller self-test failed.	
0107-xx	CMOS RAM test failed.	The following steps apply to 0107-xx through 0109-xx:
0108-xx	CMOS interrupt test failed.	1. Replace the battery/clock module and retest.
0109-xx	CMOS clock test failed.	2. Replace the system board and retest.
0110-xx	Programmable timer test failed.	Replace the system board and retest.
0113-01	Protected mode test failed.	Replace the system board and retest.
0114-01	Speaker test failed.	1. Verify the speaker connection.
		2. Replace speaker (if applicable) and retest.
		3. Replace the system board and retest.
0199-xx	Installed devices test failed.	1. Check system configuration.
		2. Verify cable connections.
		3. Check switch settings.
		4. Run Diagnostics utility.
		5. Remove all devices except processor and replace one-at-a-time until a failure occurs.
		6. Replace the system board.

Memory

Error Code	Description	Recommended Action
0200-xx	Machine ID test failed.	Reinsert memory modules and retest.
0202-xx	System ROM checksum failed	The following steps apply to 0202-xx through 0215-xx:
0203-xx	Write/read test failed.	1. Remove one memory module at a time until the error message stops.
0204-xx	Address test failed.	2. Replace other removed modules one at a time, testing each to ensure the error does not return.
0205-xxx	Walking 1s test failed.	3. Replace defective modules.
0209-xxx	RAM long test failed.	4. If error continues, replace system board and retest.
0211-xx	Random pattern test failed.	
0212-xxx	Cache test failed.	
0214-xx	Noise test failed.	The following steps apply to 0214-xx through 0215-xx:
0215-xx	Random address test failed.	1. Remove one memory module at a time until the error message stops.
		2. Replace other removed modules one at a time, testing each to ensure the error does not return.
		3. Replace the system board and retest.

Keyboard

Error Code	Description	Recommended Action
0300-xx	ID test failed	The following steps apply 0300-xx through 0304-xx:
0301-xx	Self-test/interface test failed.	1. Check the keyboard connection. If disconnected, turn the computer off and connect the keyboard.
0302-xx	Individual key test failed.	2. Replace the keyboard and retest.
0304-xx	Repeat test failed.	3. Replace the system board and retest.

✎ Holding any key down during the boot-up sequence causes the Basic Input Output System (BIOS) to beep, as a warning of possible keyboard problems. Wait until after the system has booted, then press the Num Lock key. If the Num Lock light on the keyboard toggles on and off with each press of the key, the keyboard is functioning properly.

Parallel Port

Error Code	Description	Recommended Action
0401-xx	Failed or not connected	The following steps apply to 0401-xx through 0403-xx:
0402-xx	Printer port test failed.	1. Connect the printer.
0403-xx	pattern test failed.	2. Check power to the printer.
		3. Install the loop-back connector and retest.
		4. Replace system board and retest.

Diskette Drive

Error Code	Description	Recommended Action
0600-xx	ID drive types test failed.	The following steps apply to 0600-xx through 0698-xx:
0601-xx	Format failed.	1. Replace the diskette media and retest.
0602-xx	Read test failed.	2. Reseat and/or replace the diskette power and signal cables and retest.
0603-xx	Write, read, compare test failed.	3. Replace the diskette drive and retest.
0604-xx	Random seek test failed.	4. Replace the system board and retest.
0605-xx	ID media test failed.	
0606-xx	Speed test failed.	
0609-xx	Diskette reset controller failed.	
0610-xx	Change line test failed.	
697-xx	Diskette type error.	
698-xx	Diskette drive speed not within limits.	
699-xx	Diskette drive/media error.	1. Replace the diskette media and retest.
		2. Run Computer Setup and TEST.

Serial Port

Error Code	Description	Recommended Action
1101-xx	Serial port test failed.	1. Run Computer Setup or Windows NT, Windows 95, or Windows 98 utilities.
		2. Replace the system board and retest.

Modem Communications

Error Code	Description	Recommended Action
1201-xx	Internal test failed.	The following steps apply to 1201-xx through 1210-xx:
1203-xx	External termination test failed.	1. Disconnect from the phone line and retest.
1204-xx	Auto originate test failed.	2. Check the phone number.
1205-xx	Auto answer test failed.	3. Check the modem line.
1210-xx	Direct connect test failed.	4. Replace the modem and retest.

Hard Drive

Error Code	Error	Recommended Action
1701-xx	Format test failed.	The following steps apply to 1701-xx through 1736-xx:
1702-xx	Read test failed.	1. Run Computer Setup and verify drive type.
1703-xx	Write/read/compare test failed.	2. Reseat or replace the hard drive signal and power cables and retest.
1704-xx	Random seek test failed.	3. Clear CMOS.
1705-xx	Controller test failed.	4. Run the hard drive DPS test.
1708-xx	Format bad track test failed.	5. Replace the hard drive and retest.
1710-xx	Park head test failed.	6. Replace the system board and retest.
1715-xx	Head select test failed.	
1716-xx	Conditional format test failed.	
1717-xx	ECC* test failed.	
1719-xx	Power mode test failed.	
1724-xx	Network preparation test failed.	
1736-xx	Monitoring test failed.	

*Error Correction Code

Tape Drive

Error Code	Description	Recommended Action
1900-xx	ID test failed.	The following steps apply to 1900-xx through 1910-xx:
1901-xx	Servo test failed.	1. Replace the tape cartridge and retest.
1902-xx	Format or format verification test failed.	2. Reseat and/or replace the signal cable and retest.
1903-xx	Sensor test failed.	3. Check the switch settings on the adapter card (if applicable).
1904-xx	BOT/EOT test failed.	4. Replace the tape adapter card (if applicable) and retest.
1905-xx	Read test failed.	5. Replace the tape drive and retest.
1906-xx	Write/read/compare failed.	6. Replace the system board and retest.
1910-xx	Tape erase test failed.	

Video

Error Code	Description	Recommended Action
501-xx	Graphics controller test failed.	The following steps apply to 501-xx through 516-xx:
502-xx	Video memory test failed.	1. Replace the monitor and retest.
503-xx	Video attribute test failed.	2. Replace the graphics controller and retest.
504-xx	Video character test failed	3. Replace the system board and retest.
505-xx	Video 80 × 25 mode 9 × 14 character cell test failed.	
506-xx	Video 80 × 25 mode 8 × 8 character cell test failed.	
507-xx	Video 40 × 25 mode test failed.	
508-xx	Video 300 × 200 mode color set 0 test failed.	
509-xx	Video 320 × 200 mode color set 1 test failed.	
510-xx	Video 640 × 200 mode test failed.	
511-xx	Video screen memory page test failed.	
512-xx	Video gray scale test failed.	
514-xx	Video white screen test failed.	
516-xx	Video noise pattern test failed.	
2401-xx	Graphics controller test failed.	1. Reseat the video card (if applicable) and retest.
		2. Replace the video card and retest.
		3. Replace the system board and retest.
2402-xx	Memory test failed.	The following steps apply to 2402-xx through 2419-xx:
2403-xx	Attribute test failed.	1. Reseat the video card (if applicable) and retest.

Continued

2402-2419 Continued

Error

Code	Description	Recommended Action
2404-xx	Character set test failed.	2. Run the Configuration and Diagnostics utilities.
2405-xx	80 × 25 mode 9 × 14 character cell test failed.	3. Replace the monitor and retest.
2406-xx	80 × 25 mode 8 × 8 character cell test failed.	4. Replace the video/system board and retest.
2408-xx	320 × 200 mode color set 0 test failed.	
2409-xx	320 × 200 mode color set 1 test failed.	
2410-xx	640 × 200 mode test failed.	
2411-xx	Screen memory page test failed.	
2412-xx	Gray scale test failed.	
2418-xx	ECG/VGC memory test failed.	
2419-xx	ECG/VGC ROM checksum test failed.	
2420-xx	Graphics attribute test failed.	Replace the monitor and retest.
2421-xx	ECG/VGC 640 × 200 graphics mode test failed.	1. Reseat the video card (if applicable) and retest.
		2. Replace the video/system board and retest.
2422-xx	ECG/VGC 640 × 350 16 color set test failed.	The following steps apply to 2422-xx through 2456-xx:
2423-xx	ECG/VGC 640 × 350 64 color set test failed.	1. Reseat the video card (if applicable) and retest.
2424-xx	ECG/VGC monochrome text mode test failed.	2. Run the Configuration and Diagnostics utilities.
2425-xx	ECG/VGC monochrome graphics mode test failed.	3. Replace the monitor and retest.
2431-xx	640 × 480 graphics test failed.	4. Replace the video/system board and retest.
2432-xx	320 × 200 graphics (256 color mode) test failed.	
2448-xx	Advanced VGA Controller test failed.	
2451-xx	132-column Advanced VGA test failed.	
2456-xx	Advanced VGA 256 Color test failed.	
2458-xx	Advanced VGA BitBLT test.	The following steps apply to 2458-xx through 2480-xx:
2468-xx	Advanced VGA DAC test.	1. Reseat the video card (if applicable) and retest.
2477-xx	Advanced VGA data path test.	2. Replace the video card and retest.
2478-xx	Advanced VGA BitBLT test.	3. Replace the system board and retest.
2480-xx	Advanced VGA Linedraw test.	

Audio

Error Code	Description	Recommended Action
3206-xx	Audio System Internal Error.	Replace the system board and retest.

Note: When Windows 95 or 98 are installed, changes to ESS sound device configuration do not take effect until the computer is restarted (turned off and on).

Network Interface

Error Code	Description	Recommended Action
6000-xx	ID test failed.	The following steps apply to 6000-xx through 6089-xx:
6014-xx	Configuration test failed.*	1. Run Computer Setup or Windows NT, Windows 95, or Windows 98 utilities.
6016-xx	Reset test failed.*	2. Verify test procedures.
6028-xx	Internal test failed.*	3. Replace the network card, if installed.
6029-xx	External test failed.*	4. Replace the system board.
6054-xx	Configuration test failed.**	
6056-xx	Reset test failed.**	
6068-xx	Internal test failed.**	
6069-xx	External test failed.**	
6089-xx	Open test failed.**	

* Ethernet only.
** Token Ring only.

CD-ROM and DVD-ROM

Error Code	Description	Recommended Action
3301-xx	CD-ROM drive read test failed.	The following steps apply to 3301-xx through 3305-xx and 6600-xx through 6623-xx:
3305-xx	CD-ROM drive seek test failed.	1. Replace the CD media and retest.
6600-xx	ID test failed.	2. Check the jumper settings on the adapter card.
6605-xx	Read test failed.	3. Verify that the speakers are connected.
6608-xx	Controller test failed.	4. Reseat and/or replace the power and signal cables and retest.
6623-xx	Random read test failed.	5. Replace the CD-ROM drive and retest.

Pointing Device

Error Code	Description	Recommended Action
8601-xx	Mouse test failed.	The following steps apply to 8601-xx through 8602-xx:
8602-xx	Interface test failed	1. Replace with a working mouse and retest.
	.	2. Replace the system board and retest.

Special Error Codes

This section includes the error codes for the following devices:

- SCSI hard drives
- SCSI tape drives
- SCSI PD-CD drives
- All CD-ROM drives

The SCSI error codes consist of three components, AABB-CC, where

AA = Device Name

BB = Test Name

CC = Error Code

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

Device Names

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

Test Names

XX00-XX	ID
XX05-XX	Read
XX06-XX	SA/Media
XX08-XX	Controller
XX09-XX	Media erase
XX23-XX	Random read
XX28-XX	Media load/unload

Test Error Codes

Error Code	Description	Recommended Action
XXXX-02	Drive not installed.	Check cable connections.
XXXX-03	Media not in drive.	Check for and install DATA CD or write-enabled tape in drive.
XXXX-05	Seek failure.	Replace the indicated device.
XXXX-06	Drive timed out.	Replace the indicated device.
XXXX-07	Drive busy.	Replace the indicated device.
XXXX-08	Drive already reserved.	Replace the indicated device.
XXXX-09	Unknown.	
XXXX-10	Unknown.	
XXXX-11	Media soft error.	Replace the indicated device.
XXXX-12	Drive not ready.	Replace the indicated device.
XXXX-13	Media error.	Replace the indicated device.
XXXX-14	Drive hardware error.	Replace the indicated device.
XXXX-15	Illegal drive command.	Replace the indicated device.
XXXX-16	Media was changed.	Replace the indicated device.
XXXX-17	Tape write-protected.	1. Disable write-protect on tape cartridge. 2. Replace tape drive.
XXXX-18	No data detected.	Replace the indicated device.
XXXX-21	Drive command aborted.	Replace the indicated device.
65XX-24	Media hard error.	1. Back up data and perform Surface Analysis to reallocate defect. 2. Replace drive.
66XX-24	Media hard error.	1. Replace current DATA CD with different DATA CD. 2. Replace drive.
67XX-24	Media hard error.	1. Ensure correct media type for this tape drive. 2. Replace current tape with new tape. 3. Replace tape drive.
XXXX-25	Unknown.	
XXXX-30	Controller timed out.	Replace the indicated device.
XXXX-31	Unrecoverable error.	Replace the indicated device.
XXXX-32	Controller/drive disconnected.	Replace the indicated device.
XXXX-33	Illegal controller command.	Replace the indicated device.
XXXX-34	Invalid SCSI bus phase.	Replace the indicated device.
XXXX-35	Invalid SCSI bus phase.	Replace the indicated device.

Continued

Test Error Codes Continued

Error

Code	Description	Recommended Action
XXXX-36	Invalid SCSI bus phase.	Replace the indicated device.
XXXX-39	Error status from drive.	Replace the indicated device.
XXXX-40	Target timed out.	Replace the indicated device.
XXXX-41	SCSI bus stayed busy.	Replace the indicated device.
XXXX-42	ACK/REQ lines bad.	Replace the indicated device.
XXXX-43	ACK did not deassert.	Replace the indicated device.
XXXX-44	Parity error.	Replace the indicated device.
XXXX-50	Data pins bad.	Replace the indicated device.
XXXX-51	Data line 7 bad.	Replace the indicated device.
XXXX-52	MSG, C/D, and/or I/O lines bad.	Replace the indicated device.
XXXX-53	BSY never went busy.	Replace the indicated device.
XXXX-54	BSY stayed busy.	Replace the indicated device.
XXXX-60	Controller CONFIG-1 register bad.	Replace the indicated device.
XXXX-61	Controller CONFIG-2 register bad.	Replace the indicated device.
XXXX-65	Media not unloaded.	Replace the indicated device.
XXXX-90	Fan failure.	1. Ensure fan(s) connected. 2. Replace nonfunctional fan(s).
XXXX-91	Over temperature.	1. Ensure proper air flow. 2. Perform required maintenance and cleaning.
XXXX-99	Autoloader reported tapes not loaded properly.	1. Install tape(s) in autoloader tape drive according to test instructions. 2. Change autoloader magazine.

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