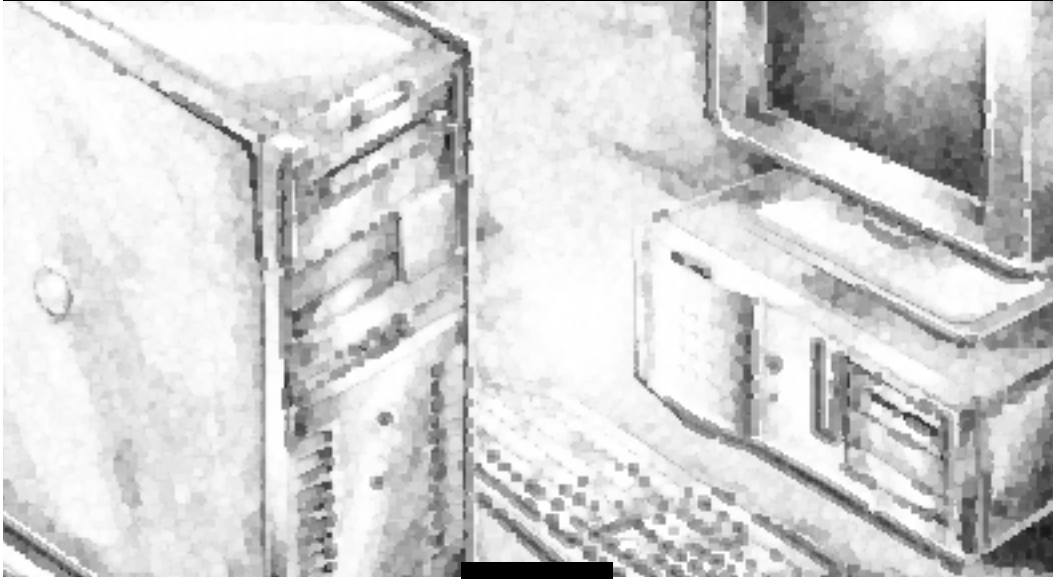


Dell Dimension[®] XPS H233 and XPS H266 Systems

SERVICE MANUAL



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May 1997 P/N 84980

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Read This First

A prerequisite for using this manual to service Dell computer systems is a basic knowledge of IBM®-compatible PCs and prior training in IBM-compatible PC troubleshooting techniques. In addition to information provided in this manual and the online *System User's Guide* that came with the system, Dell provides the *Diagnostics and Troubleshooting Guide* for troubleshooting procedures and instructions on using the Dell diagnostics to test the computer system.

Warnings, Cautions, and Notes

Throughout this manual, there may be blocks of text printed in bold type or in italic type. These blocks are warnings, cautions, and notes, and they are used as follows:

WARNING: A **WARNING** indicates the potential for bodily harm and provides instructions for how to avoid the problem.

CAUTION: A **CAUTION** indicates either potential damage to hardware or loss of data and provides instructions for how to avoid the problem.

NOTE: A *NOTE* provides helpful information about using the computer system.

Chapter 1

System Overview

The Dell Dimension[®] XPS H233 and XPS H266 systems are high-speed, single-processor computer systems that use an Intel[®] Pentium[®] II micro-processor with MMX[™] technology. These Dell[®] systems incorporate an ISA expansion bus as well as a high-performance PCI local bus. These buses are built into the system board, which also integrates all other elements of the basic computer system.

The Dell Dimension XPS H233 and XPS H266 systems are available in either a desktop or a mini tower configuration. Both configurations use the same system board and base chassis. The only difference, other than physical mounting, is the number of externally-accessible 3.5-inch drive bays.

The Dell Dimension XPS H233 system operates at an internal frequency of 233 MHz and an external frequency of 66 MHz. The Dell Dimension XPS H266 system operates at an internal frequency of 266 MHz and an external frequency of 66 MHz. A single-edge contact (SEC) cartridge connected to the system board contains the system's microprocessor and cache circuitry.

Main memory consists of two or four EDO SIMMs arranged in pairs. The base configuration for main memory is two 16-MB nonparity SIMMs. Main memory can be expanded up to 128 MB using 16- or 32-MB SIMMs.

The front of the computer has two 5.25-inch drive bays, one (desktop system) or two (mini tower system) 3.5-inch drive bay(s), plus a 3.5-inch diskette-drive bay. The 5.25-inch and 3.5-inch drive bays can hold diskette drives, tape drives, or CD-ROM drives.

System Features

In addition to the standard features found in a traditional PC, the Dell Dimension XPS H233 and XPS H266 systems include the following new and/or advanced features:

- An Intel Pentium II microprocessor with MMX technology, specifically designed to handle complex multimedia and communications software.
- Secondary cache of 512 KB of SRAM included within the SEC cartridge.
- Main memory consisting of 32 to 128 MB of high-speed EDO SIMMs.
- Error correction code (ECC) support built into the system board that corrects single-bit errors and detects all multiple-bit errors when parity SIMMs are installed.
- Three 32-bit PCI expansion-card slots and two 16-bit ISA expansion-card slots. One shared expansion-card slot can accept either a PCI or an ISA expansion card.
- Support for SCSI hard-disk drives and CD-ROM drives when a SCSI controller card is installed in an expansion-card slot.
- A high-speed, high-resolution PCI video controller card installed in an expansion-card slot, rather than an integrated video controller, to provide video flexibility for customers.
- A 16-bit integrated audio controller that provides sound functions compatible with a Sound Blaster Pro expansion card.
- A MIDI/game port for connecting a MIDI device, joystick, game pad, or other game input device.
- An integrated high-performance serial port and a bidirectional parallel port.
- Two USB connectors, which can simplify connecting peripheral devices.

Most of these features are briefly described in this chapter. For a complete list of system features, see “Technical Specifications” found later in this chapter.

When following the procedures in this manual, assume that the locations or directions relative to the computer are as shown in Figure 1-1.

NOTE: Some service procedures recommend laying the mini tower computer on its right side to improve service access, but the descriptions in this manual continue to use the directions shown in Figure 1-1 for the mini tower computer.

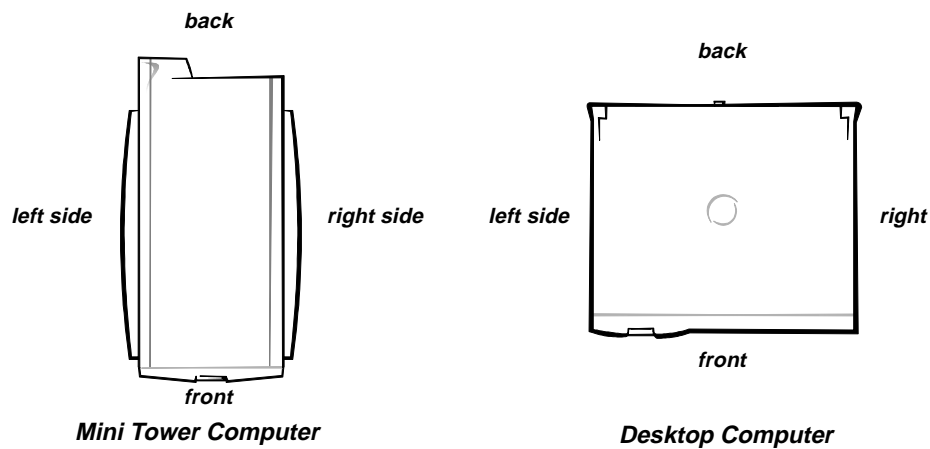


Figure 1-1. Computer Orientation

CAUTION: To avoid possible data or file structure corruptions, the reset button should only be used when the system cannot be rebooted by pressing <Ctrl><Alt>. Before you use the reset button to initiate a hardware reset, close any open application programs and files if possible.

CAUTION: Ensure that all expansion-card slots have either a card-mounting bracket or a metal filler bracket installed. Ensure that the unoccupied drive bays have a front-panel insert installed. Omitting these inserts or brackets can disturb the normal airflow in the computer, resulting in possible damage to system components.

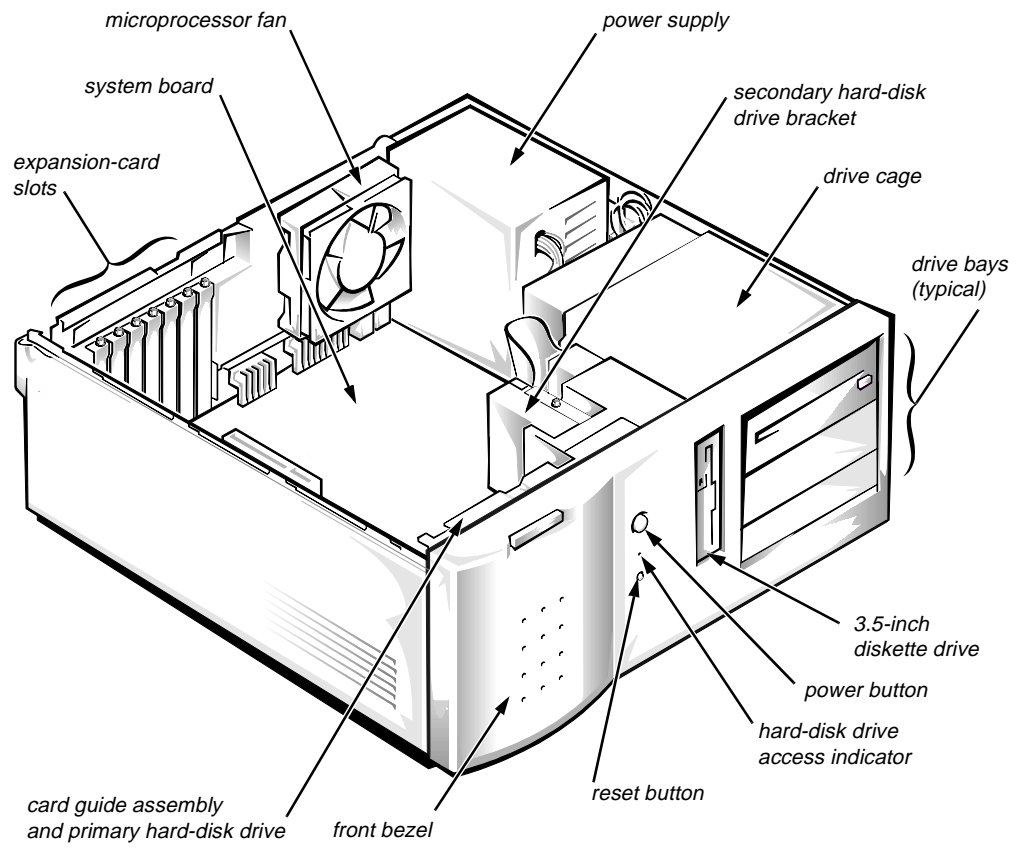


Figure 1-2. Desktop Computer Features

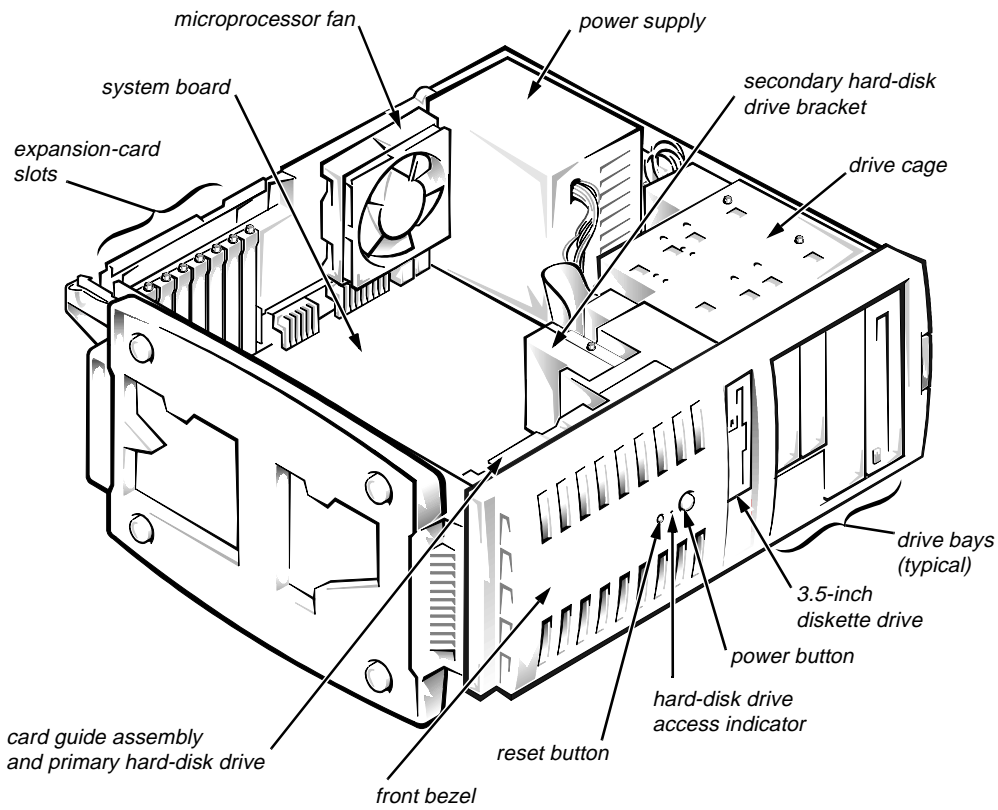


Figure 1-3. Mini Tower Computer Features

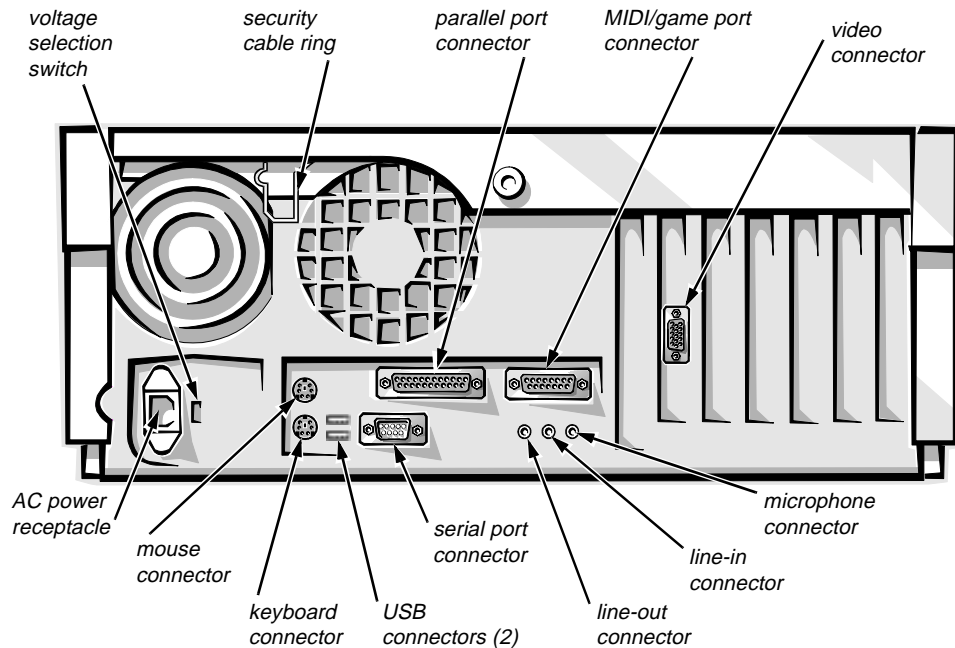


Figure 1-4. Back-Panel Features (Typical)

Advanced Expansion Subsystem

This computer system offers an advanced expansion subsystem that can support a mixture of traditional ISA expansion cards (called legacy expansion cards), Plug and Play ISA expansion cards, and PCI expansion cards. Either the operating system or the ISA Configuration Utility (ICU) provides the means to configure the various types of expansion cards and to avoid resource conflicts that might arise.

NOTES: The ICU is required only when the system runs a non-Plug-and-Play operating system (such as Microsoft® Windows NT® 4.0 and earlier) and includes legacy ISA expansion cards. With the Microsoft Windows® 95 operating system, the functions provided by the ICU are handled by the Device Manager, which can be accessed by double-clicking the System icon in the Control Panel. Windows 95 documentation provides instructions on using the Device Manager to manage resources and resolve conflicts.

Because Dell ships only Plug and Play and PCI expansion cards on Dell Dimension systems that have a non-Plug-and-Play operating system, the ICU is not provided with systems. This utility can be downloaded from Dell's online services.

After all legacy expansion cards have been configured by the operating system or with the ICU, the system automatically assigns any required memory space, IRQ lines, and DREQ lines to any installed Plug and Play and PCI expansion cards the next time the system is booted.

Chapter 2, “Using Configuration Software,” in the *Reference Guide* and the “Configuring Expansion Cards” section in the online *System User’s Guide* (located in the Dell Accessories folder) provide instructions for using the ICU to configure legacy ISA expansion cards.

The expansion-card slots include three ISA expansion-card connectors and four PCI expansion-card connectors. One PCI expansion-card connector and one ISA expansion-card connector share a single expansion-card slot, so a maximum of six expansion cards can be installed.

EIDE Subsystem

The EIDE subsystem includes two EIDE interfaces (primary and secondary), each of which can support up to two EIDE devices such as high-capacity EIDE hard-disk drives, CD-ROM drives, and tape drives.

When two EIDE drives are connected to a single EIDE interface cable, a master/slave relationship must be defined between the two drives so that they will operate correctly while cabled together. Assigning the master and slave designations usually involves resetting jumpers on the circuit card on the underside of each drive. The master/slave relationship is defined in different ways for different types of drives. For details about a specific drive, refer to the documentation included with the drive. When you replace a drive, look at the jumpers on the removed drive to set the jumpers on the replacement drive.

NOTE: The externally accessible drive bays at the front of the computer are normally used for diskette drives, CD-ROM drives, or tape drives. The hard-disk drives should be installed in the internal drive bays as described in the following subsection. For detailed information about the data storage subsystem, see “Installing Drives” in the online System User’s Guide, which is located in the Dell Accessories folder.

Hard-Disk Drive Options

A 1-inch-high EIDE or SCSI hard-disk drive is installed in the primary hard-disk drive bay in the card guide assembly at the front of the chassis. An optional 1-inch-high EIDE or SCSI hard-disk drive can be installed in the secondary hard-disk drive bay located near the 3.5-inch diskette drive. SCSI hard-disk drives require a SCSI controller card installed in an expansion-card slot.

Computer Service

The following subsections provide service-related information about the computer.

Power Supply

The 200-W power supply can operate from an AC power source of 115 VAC at 60 Hz or 230 VAC at 50 Hz. The power supply provides the DC operating voltages and currents listed in Table 1-1.

NOTE: The power supply produces DC voltages only under its loaded condition. The DC power cable connectors must be connected to their corresponding power input connectors on the system board or drives in order to measure these voltages.

Table 1-1. DC Voltage Ranges

Voltage	Range	Maximum Output Current
+3.3 VDC	+3.14 to +3.47 VDC	14.00 A ¹
+5 VDC	+4.90 to +5.25 VDC	22.00 A ¹
-5 VDC	-4.50 to -5.50 VDC	0.300 A
+12 VDC	+11.40 to +12.60 VDC	6.00 A ²
-12 VDC	-10.80 to -13.20 VDC	0.300 A
+5 VSB ³	+4.75 to +5.25 VDC	0.010 A

¹ The combined load on the +3.3 VDC and +5 VDC outputs cannot exceed 140 W.

² The +12-VDC output line can withstand surges of up to 11.0 A to support disk start-up operations.

³ The +5 VSB (volts standby) is sometimes called "flea power."

DC Power Distribution

Figures 1-5 through 1-9 provide the following information about DC power distribution:

- Power-supply cable identification
- Typical DC power connections for diskette, tape, CD-ROM, and hard-disk drives
- Power distribution to sockets and connectors on the system board
- Pin assignments of DC power connectors

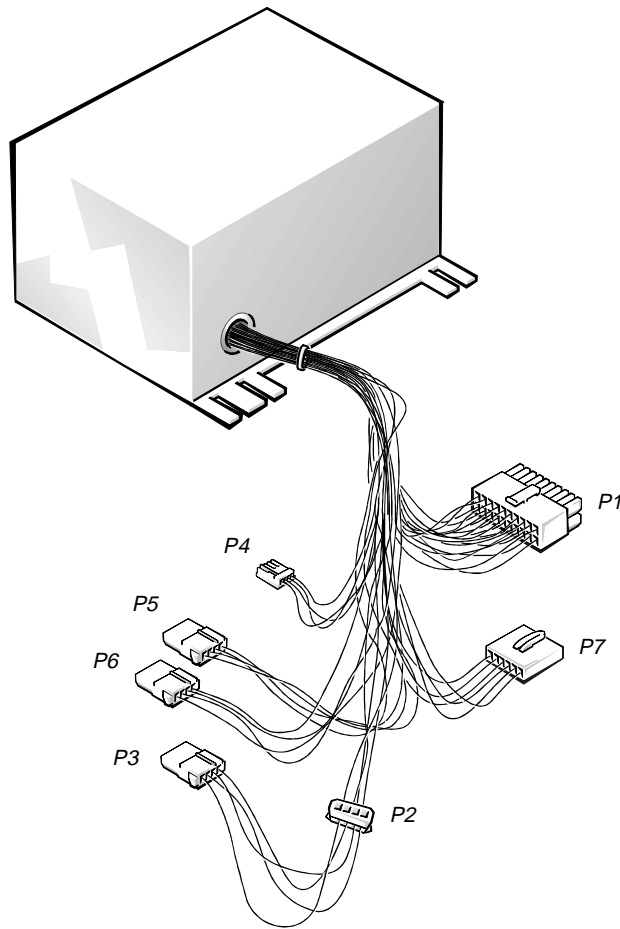


Figure 1-5. DC Power Cables

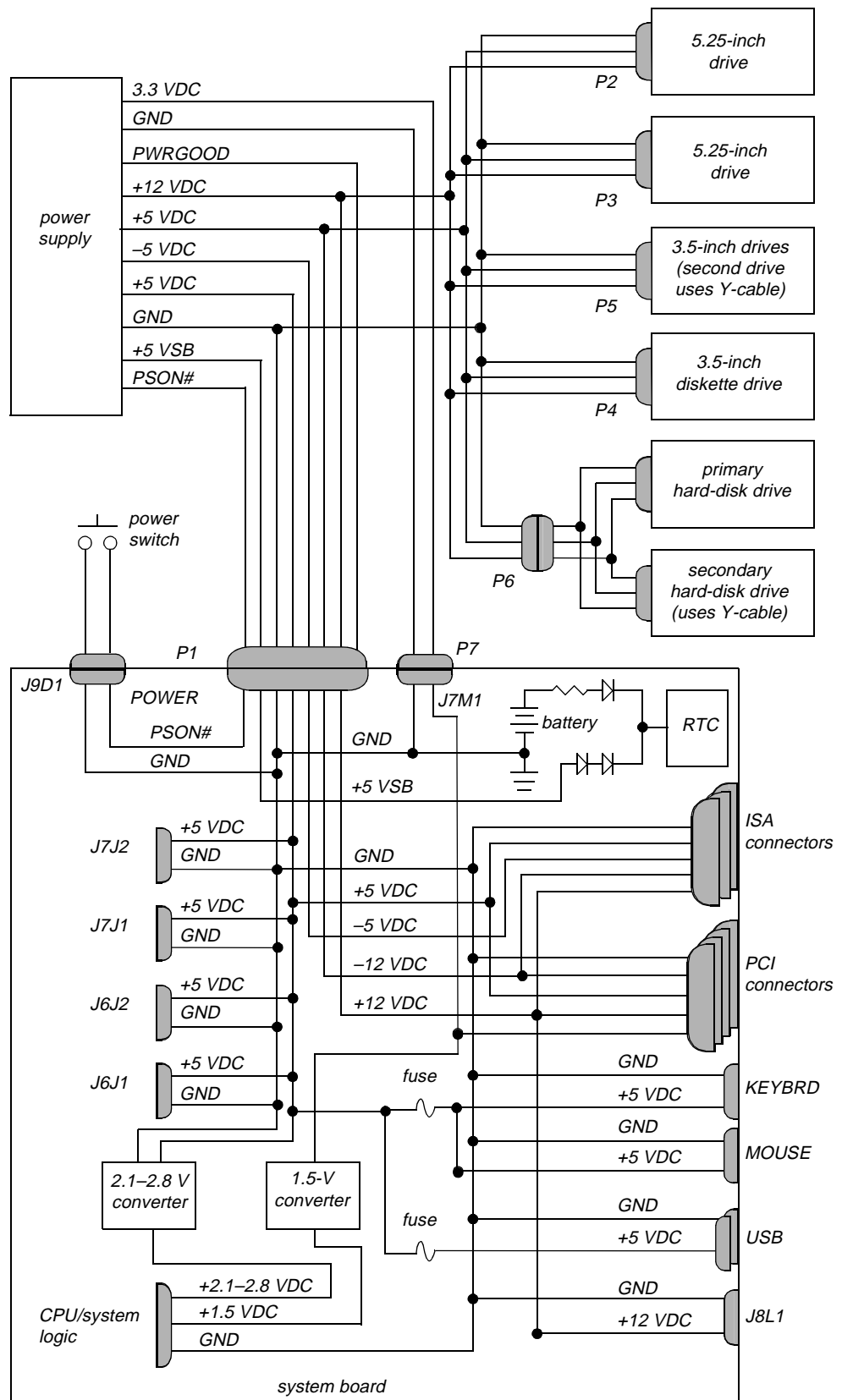
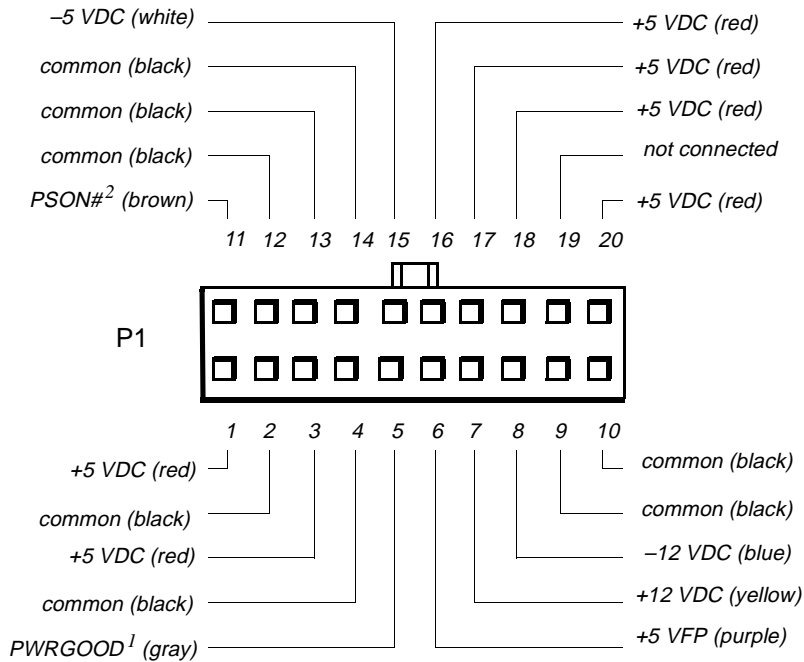


Figure 1-6. DC Power Distribution

DC Power Connector Pin Assignments

The power-supply output voltages can be measured at the back (wire side) of the DC power connectors without disconnecting them. Figures 1-7 through 1-9 show the wire side of the connectors.



- 1 Pin 5 — PWRGOOD is a status signal generated by the power supply to notify the system that the DC operating voltages are within the ranges required for proper system operation.
- 2 Pin 11 — PSON# is activated by pressing and releasing the power button while the power supply is in its standby state. This action connects the power supply's PSON# input to ground, thereby switching the power supply to its full-on condition.

Figure 1-7. DC Power Connector P1

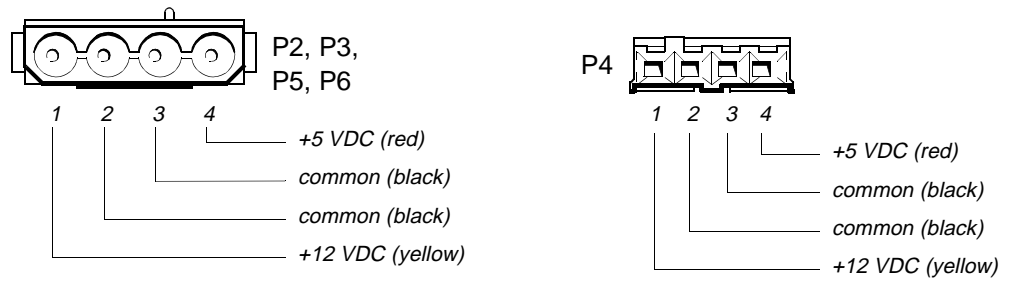


Figure 1-8. DC Power Connectors P2, P3, P4, P5, and P6

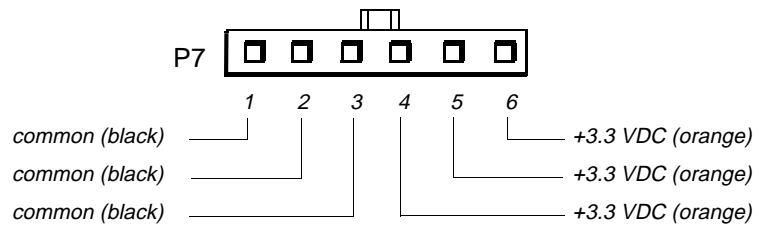


Figure 1-9. DC Power Connector P7

System Board

The subsections that follow provide service-related information about system board components.

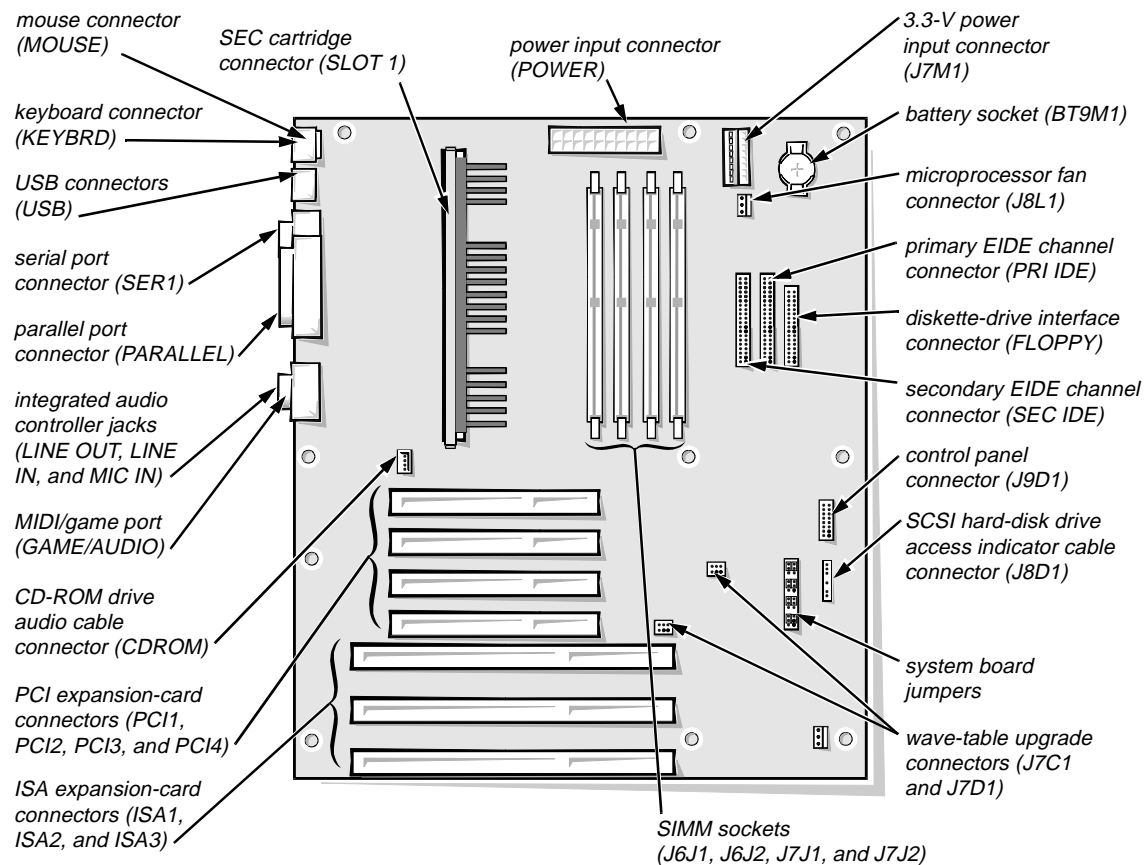


Figure 1-10. System Board Features

Main Memory

The four SIMM sockets can accommodate one or two pairs of EDO SIMMs. The base configuration for main memory is one pair of 16-MB nonparity SIMMs installed in sockets J6J1 and J6J2. Main memory can be expanded using pairs of 16- or 32-MB SIMMs. The SIMMs within each pair (J6J1 and J6J2 or J7J1 and J7J2) must be the same capacity and parity type, but the two pairs need not match each other.

The system's ECC support, which is built into the system board, corrects single-bit errors and detects all multiple-bit errors. To use the ECC support, all installed SIMMs must be parity SIMMs.

System Board Jumpers

See Figure 1-11 and Table 1-2 for jumper settings and descriptions.

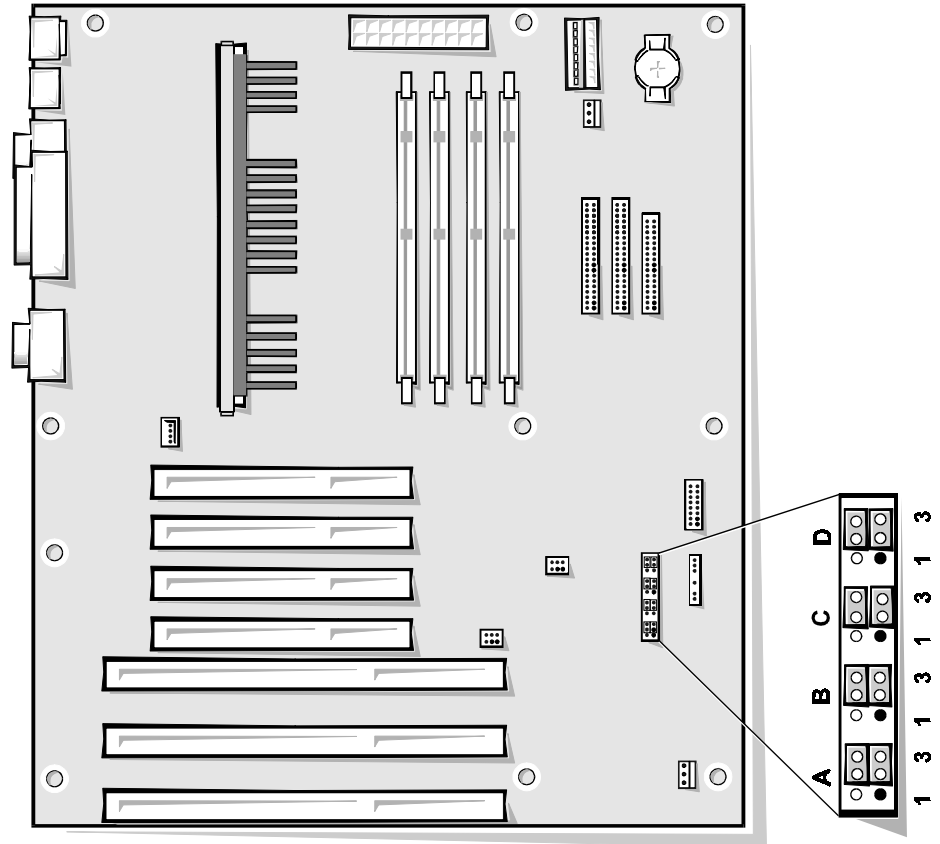












Figure 1-11. System Board Jumpers

Table 1-2. System-Board Jumper Descriptions

Jumper Settings	Description
A, pins 1-3; B, pins 1-6; C, pins 1-3 (microprocessor speed)	The microprocessor's internal speed is 233 MHz.
  	The microprocessor's internal speed is 266 MHz.
A, pins 4-6 (reserved)	Reserved (<i>do not change</i>).
	C, pins 4-6 (clear CMOS)
	System setup settings are retained when the system boots (default setting).
	System setup settings revert to their defaults when the system boots. (Set to pins 4-5 and boot the system to clear NVRAM. Reset to pins 5-6 to restore default CMOS settings at system start-up.)
D, pins 1-3 (password)	The system and setup password features are enabled (default setting).
	The password features are disabled. (Set to pins 1-2, and then turn on the system to clear the password(s). Reset to pins 2-3 to enable password features.)
	D, pins 4-6 (setup)
	Set to pins 5-6 to allow use of the system setup program.
	Set to pins 4-5 to prevent the loading of the system setup program.

Interrupt Assignments

Table 1-3. Interrupt Assignments

IRQ Line	Used By/Available
IRQ0	Generated by system timer.
IRQ1	Generated by I/O controller to indicate full keyboard output buffer.
IRQ2	Generated internally by interrupt controller to enable IRQ8 through IRQ15.
IRQ3	Available for use by an expansion card.
IRQ4	Generated by I/O controller to indicate that the device connected to the serial port requires service (COM1 or COM3).
IRQ5	Default audio IRQ assignment.
IRQ6	Generated by I/O controller to indicate that the diskette drive or tape drive requires service.
IRQ7	Generated by I/O controller to indicate that the device connected to the parallel port requires service.
IRQ8	Generated by I/O controller for each tick of the RTC.
IRQ9	Available for use by an expansion card.
IRQ10	Available for use by an expansion card.
IRQ11*	Default PCI IRQ assignment.
IRQ12	Generated by I/O controller to indicate full mouse output buffer.
IRQ13	Generated by math coprocessor to indicate a coprocessor error.
IRQ14	Generated by a device connected to the primary EIDE interface to indicate that the device requires service.
IRQ15	Generated by a device connected to the secondary EIDE interface to indicate that the device requires service. If no device is connected to the secondary EIDE interface, IRQ15 is available for use by an expansion card.

* The PCI IRQ line is assigned to an available IRQ line after all ISA expansion cards have been configured. If an ISA expansion card is configured for IRQ11, the PCI IRQ is assigned to another available IRQ line.

DMA Channel Assignments

Table 1-4. DMA Channel Assignments

DREQ Line	Used By/Available
DREQ0	Default audio DMA channel assignment
DREQ1	Default audio DMA channel assignment
DREQ2	Generated by I/O controller to enable DMA cycle for attached diskette drive
DREQ3	Available for use by an expansion card
DREQ4	Reserved — selects second DMA controller
DREQ5	Available for use by an expansion card
DREQ6	Available for use by an expansion card
DREQ7	Available for use by an expansion card

Technical Specifications

Table 1-5. Technical Specifications

Microprocessor	
Microprocessor type	Intel Pentium II microprocessor with MMX technology
Microprocessor speeds	233 MHz internally/66 MHz externally 266 MHz internally/66 MHz externally
Compatibility speeds	can be set through the system setup program (all cache memory is disabled to simulate compatibility speed)
Internal cache	32 KB
Math coprocessor	internal to Pentium II microprocessor with MMX technology

System Information	
System chip set	Intel 440FX PCIset
Data bus width	64 bits
Address bus width	32 bits
DMA channels	seven
Interrupt levels	15
System BIOS chip	256 KB

Expansion Bus	
Bus types	ISA and PCI
PCI specification	complies with PCI specification 2.1
PCI bus frequency	33 MHz
ISA bus frequency	8.25 MHz
ISA expansion-card connectors	three (one connector shares card-slot opening with PCI expansion-card connector)
PCI expansion-card connectors	four (one connector shares card-slot opening with ISA expansion-card connector)

Table 1-5. Technical Specifications (continued)

System Clocks	
System clock frequency	66 MHz (matches external processor speed)
Diskette/communications ports frequency	24 MHz (derived from system clock)

Memory	
SIMM sockets	four
SIMM capacities	16 and 32 MB
Minimum RAM	32 MB
Maximum RAM	128 MB EDO
Secondary cache	512-KB pipelined write-back SRAM on SEC cartridge
Memory access time:	
tRAC	60 ns
tCAC	15 ns
BIOS address	F0000h

Drive Bays	
Externally accessible:	
Desktop chassis	four total: two bays for 5.25-inch diskette drives, tape drives, or CD-ROM drives; one bay for a 3.5-inch diskette drive or tape drive; and one bay for a 3.5-inch diskette drive
Mini tower chassis	five total: two bays for 5.25-inch diskette drives, tape drives, or CD-ROM drives; two bays for 3.5-inch diskette drives or tape drives; and one bay for a 3.5-inch diskette drive
Internally accessible (both chassis)	two bays for 1-inch-high EIDE or SCSI hard- disk drives

Table 1-5. Technical Specifications (continued)

Ports	
Externally accessible:	
Serial (DTE)	9-pin connector
Parallel (bidirectional)	25-hole connector
PS/2-style keyboard	6-pin mini-DIN connector
PS/2-compatible mouse	6-pin mini-DIN connector
USB	two USB-compliant connectors
MIDI/game	15-pin connector
Audio	three miniature jacks for line in, line out, and microphone
Video	15-hole connector on video card
Internally accessible:	
Primary EIDE	40-pin connector
Secondary EIDE	40-pin connector
Diskette drive	34-pin connector
Wave-table upgrade module	two 6-pin connectors
CD-ROM drive audio cable connector	4-pin connector
Video	
Video type	PCI video card in an expansion-card slot (see manufacturer's specifications)
Controls and Indicators	
Reset control	push button
Power control	push button
Power indicator	green LED
Hard-disk drive access indicator	green LED

Table 1-5. Technical Specifications (continued)

Power	
DC power supply:	
Wattage	200 W
Input voltage	90 to 135 VAC at 60 Hz or 180 to 265 VAC at 50 Hz
Heat dissipation.	778 BTUs (fully loaded system without monitor)
System battery.	3-V CR2032 coin cell

Physical Specifications	
Desktop chassis:	
Height	16.00 cm (6.3 inches)
Width.	42.42 cm (16.7 inches)
Depth.	44.45 cm (17.5 inches)
Weight.	11.3 to 13.6 kg (25 to 30 lb)
Mini tower chassis:	
Height	43.69 cm (17.2 inches)
Width.	20.32 cm (8 inches)
Depth.	44.45 cm (17.5 inches)
Weight.	11.3 to 13.6 kg (25 to 30 lb)

Environmental	
Temperature:	
Operating	10° to 35°C (50° to 95°F)
Storage	-40° to 65°C (-40° to 149°F)
Relative humidity	20% to 80% (noncondensing)
Maximum vibration:	
Operating	0.25 G at 3 to 200 Hz at 2 octaves/minute
Storage	0.50 G at 3 to 200 Hz at 2 octaves/minute

Table 1-5. Technical Specifications (continued)

Environmental (continued)

Maximum shock:

Operating left side (for mini tower orientation) and bottom
half-sine pulse with a change in velocity of
50.8 cm/sec (20 inches/sec)

Storage 23-G faired square wave with a velocity change
of 508.0 cm/sec (200 inches/sec)

Altitude:

Operating -16 to 3048 m (-50 to 10,000 ft)

Storage -16 to 10,600 m (-50 to 35,000 ft)

Chapter 2

Basic Troubleshooting

This chapter describes basic troubleshooting procedures that can help you diagnose a computer system problem. These procedures can often reveal the source of a problem or indicate the correct starting point for troubleshooting the system. A brief explanation of how to load and start the diagnostics is provided in “Running the Diagnostics” at the end of this chapter. Dell recommends that you perform these procedures in the order they are presented in this chapter.

Initial User Contact

When you first contact a user who has a problem, ask the user to describe the problem and the conditions under which it occurs. A verbal description can often indicate the cause of a problem or indicate the appropriate troubleshooting procedure to use. After the user describes the problem, follow these steps:

- 1. Ask the user to back up any data on the hard-disk drive if the system’s condition permits.**

See “Maintaining the System” in the online *System User’s Guide* for information about backing up data.

- 2. Ask the user to try to duplicate the problem by repeating the operations he or she was performing at the time the problem occurred.**

Can the user duplicate the problem?

Yes. Proceed to step 3.

No. Proceed to the next section, “External Visual Inspection.”

- 3. Observe the user to determine if he or she is making an error, such as typing an incorrect key combination or entering a command incorrectly.**

Is the problem a result of user error?

Yes. Instruct the user in the proper procedure, or direct him or her to the appropriate user documentation for the correct procedure.

No. Proceed to the next section, “External Visual Inspection.”

External Visual Inspection

The external visual inspection consists of a quick inspection of the exterior of the computer, the monitor, the keyboard, any peripherals, and cables. While performing the visual inspection, make any necessary corrections. To perform the external visual inspection, follow these steps:

- 1. Turn off the computer, the monitor, and all peripherals.**
- 2. Verify that all power cables are properly connected to the computer, the monitor and peripherals, and their power sources.**
- 3. Verify that the keyboard and mouse interface cables are firmly attached to the proper connectors on the back of the computer.**

For a PS/2-compatible mouse, the keyboard and mouse interface cable connectors are identical except for their labels. Verify that the keyboard and mouse interface cable connectors are firmly attached to the proper connectors on the back of the computer. To identify the proper connectors, see Figure 1-4.

For a serial mouse, the mouse interface cable must be firmly attached to the serial port connector, and its captive screws must be secure enough to ensure a firm connection.

- 4. Verify that any devices attached to the serial and parallel port connectors are properly connected.**

Each of the serial and parallel interface cable connectors must be firmly attached to an appropriate connector on the back of the computer as well as to the interface connector on the device. The captive screws that secure these connectors at each end of the interface cable must be secure enough to ensure a firm connection.

- 5. Verify that the video interface cable connector is firmly attached to the video connector and to the connector on the back of the monitor.**

For proper connection of the video interface cable, see the documentation for the monitor.

- 6. Inspect all external monitor controls for any obvious damage or improper settings.**

For proper settings of the monitor controls, see the documentation for the monitor.

- 7. Inspect the keyboard to ensure that no keys are sticking.**

If one or more keys are sticking, it may be necessary to replace the keyboard.

- 8. Inspect the exterior of the computer, including all controls, indicators, and user-accessible data storage devices for any signs of physical damage.**

Does the inspection reveal any problems?

Yes. Refer to the appropriate procedure in Chapter 4, “Removing and Replacing Parts.”

No. Proceed to the next section, “Observing the Boot Routine.”

Observing the Boot Routine

After you have performed an external visual inspection as described in the previous procedure, you should boot the system and, while the boot routine is running, observe the system for any indications of problems.

NOTE: Most of the steps in this procedure require observation of system functions and indications, some of which can occur simultaneously. It may be necessary to reboot the system several times in order to complete all of these steps.

To observe problem indications during the boot routine, follow these steps:

- 1. Insert a copy of the *Dell Diagnostics Diskette* into drive A. Turn on all peripherals and the computer. If the computer is already on, press the reset button or <Ctrl><Alt> to reboot the system.**

NOTE: If the computer is already on, save and close all open files and application programs (if possible) to avoid losing any data. Then perform an orderly shutdown of the operating system (see the operating system documentation for instructions) before rebooting the system.

- 2. Check the power supply fan.**

Does the fan run normally?

Yes. Proceed to step 3.

No. Troubleshoot the system power supply.

- 3. Watch the Num Lock, Caps Lock, and Scroll Lock indicators on the upper-right corner of the keyboard. After all three indicators flash momentarily, the Num Lock indicator should light up and remain on.**

Do these indicators flash on and off within approximately 10 seconds after the boot routine starts?

Yes. Proceed to step 4.

No. Troubleshoot the system power supply. If the troubleshooting procedure indicates that the system power supply is operational, troubleshoot the memory.

4. While the boot routine is running, observe the computer for any of the following:

- Diskette-drive and hard-disk drive access indicator activity
These indicators light in response to data being transferred to or from the drives. If either of these indicators fails to light during the boot routine, troubleshoot the diskette-drive or hard-disk drive subsystem, as appropriate.

- Beep codes

A beep code is a series of beeps that indicates an error condition. If the computer emits a beep code, refer to Table 3-1.

NOTE: The computer beeps once during the boot routine. This single beep is normal and is not a beep code.

- System error messages

These messages can indicate problems or provide status information. If a system error message displays, refer to Table 3-2.

5. Observe the monitor screen for the Diagnostics Menu.

Does the Diagnostics Menu display?

Yes. See “Running the Diagnostics” found later in this chapter.

No. Proceed to step 6.

6. Insert another copy of the *Dell Diagnostics Diskette* into the diskette drive, and reboot the computer.

Does the Diagnostics Menu display?

Yes. See “Running the Diagnostics” found later in this chapter.

No. Remove the diagnostics diskette from the diskette drive; then proceed to the next section, “Internal Visual Inspection.”

Internal Visual Inspection

CAUTION: Before you proceed with the internal visual inspection described in this section, ensure that the user has saved all open files and exited all open application programs if possible.

A simple visual inspection of a computer’s interior hardware can often lead to the source of a problem, such as a loose expansion card, cable connector, or mounting screw. When you perform the visual inspection, refer to “System Features” in Chapter 1 to locate system components.

To perform the internal visual inspection, follow these steps:

- 1. Turn off the system, including any attached peripherals, and disconnect all the AC power cables from their power sources.**

2. Remove the computer cover.

NOTE: For your safety and protection of the system, observe the guidelines listed in “Precautionary Measures” in Chapter 4.

3. Verify that the single-edge contact (SEC) cartridge, SIMMs, and expansion cards are fully seated in their sockets or connectors.

WARNING: The SEC cartridge/heat sink assembly can get extremely hot. Be sure the assembly has had sufficient time to cool before you touch it.

WARNING: While reseating the SEC cartridge/heat sink assembly, use a wrist grounding strap or maintain contact with a metal surface on the chassis.

To reseat the SEC cartridge/heat sink assembly, remove it from its connector and reinstall it as described in “SEC Cartridge and Heat Sink Assembly” in Chapter 4.

To reseat a SIMM, remove it from its socket and reinstall it as described in “SIMMs” in Chapter 4.

To reseat an expansion card, remove it from its connector and reinstall it as described in “Expansion Cards” in Chapter 4.

4. Verify that all configuration jumpers are set correctly.

For information about these jumpers, see “Configuration Jumpers” in Chapter 1.

5. Check all cable connectors inside the computer to verify that they are firmly attached to their appropriate connectors.

6. Reinstall the computer cover.

7. Reconnect the computer and any attached peripherals to their power sources, and turn them on.

Does the problem appear to be resolved?

Yes. No further steps are necessary.

No. Proceed to the next section, “Eliminating Resource Conflicts.”

Eliminating Resource Conflicts

Devices within or connected to the computer may require dedicated memory spaces, interrupt levels, or DMA channels, all of which must be allocated during installation of the devices. Because devices may be installed at different times, it is possible that the same resource is assigned to two or more devices.

Resource conflicts can result in disorderly or erratic system operation or failure of the system to operate at all. If you suspect that resource conflicts might exist, check the system using the Windows 95 Device Manager or the ISA Configuration Utility (ICU), and reassign the resources as necessary. See “Advanced

Expansion Subsystem” in Chapter 1 for information on the Device Manager and the ICU. See “Interrupt Assignments” in Chapter 1 to help identify possible conflicts. Also review the documentation provided with any installed expansion cards and other devices for additional interrupt information for the specific devices.

Running the Diagnostics

The diskette-based diagnostics (included with the system) contains tests that aid in troubleshooting all major components of the computer system.

CAUTION: To prevent damage to the original *Dell Diagnostics Diskette*, always use a backup copy of the diagnostics diskette when servicing a user’s system. Dell recommends that users make several copies of this diskette to ensure that one is always available.

To start the diagnostics, turn off the computer, insert a copy of the *Dell Diagnostics Diskette* into drive A, and then turn on the computer.

Starting the diagnostics causes the Dell logo screen to display, followed by a message indicating that the diagnostics is loading. Before the diagnostics loads, a program tests the portion of main memory (RAM) required for loading the diagnostics. If a main memory error is detected, a message appears on the screen telling you which SIMM has failed.

If no errors are found in main memory, the diagnostics loads and the Diagnostics Menu displays. This menu lets you choose the following options or exit to the MS-DOS® prompt:

- Run Quick Tests — Runs selected tests from all test groups to quickly locate a failure or to indicate where further testing is needed to isolate a failure
- Run All Tests — Runs all tests for a thorough check of the system
- Run Specific Tests — Tests a particular area or subsystem

See the chapter titled “Running the Diskette-Based Diagnostics” in the *Diagnostics and Troubleshooting Guide* for more information.

Getting Help

If none of the troubleshooting procedures in this chapter or the tests in the diagnostics reveal the source of the problem or lead to the proper troubleshooting steps for determining the source of the problem, call Dell for technical assistance. For instructions, see “Contacting Dell” in the online *System User’s Guide* or the chapter titled “Getting Help” in the *Diagnostics and Troubleshooting Guide*.

Chapter 3

Beep Codes and Error Messages

This chapter describes beep codes and system error messages that can occur during system start-up or, in the case of some failures, during normal system operation. In some cases, the system may display error messages and emit beep codes simultaneously. In other cases, such as when a video problem occurs, the system may emit a beep code even though it cannot display an error message.

If a faulty system does not emit beep codes or display system error messages to indicate a failure, run the appropriate tests in the diskette-based diagnostics to help you isolate the source of the problem. For instructions on starting and using the diskette-based diagnostics, see “Running the Diagnostics” in Chapter 2.

POST Beep Codes

If the monitor cannot display error messages during the POST, the computer may emit a series of beeps that identifies the problem or that can help identify a faulty component or assembly. Table 3-1 lists the beep codes that may be generated during POST. All beep codes, except beep code 8, indicate a fatal error that prevents the system from completing the boot routine until the indicated condition is corrected.

NOTE: It is normal for the computer to emit a single beep during the boot routine. If the boot routine completes successfully, this single beep is not considered a beep code.

When the system emits a beep code, record the code and then find it in Table 3-1. If Table 3-1 does not lead to the source of the problem, run the appropriate tests in the diskette-based diagnostics to assist in troubleshooting the problem.

Table 3-1. POST Beep Codes

Beep Code	Error	Probable Causes
1	Memory refresh failure.	Defective system board.
2	Memory parity error.	A SIMM is faulty. Replace all of the SIMMs. Defective system board.
3	Memory failure occurred in first 64 KB of main memory.	A SIMM is faulty. Replace all of the SIMMs.
4	Timer failure.	A SIMM is faulty. Replace all of the SIMMs. Defective system board.
5	Microprocessor error.	Defective microprocessor.
6	Gate A20 failure.	Defective system board.
7	Microprocessor-exception interrupt error.	Defective microprocessor.
8	Video memory read/write error.	System's video adapter is missing or faulty.
9	ROM checksum value does not match value encoded in system BIOS.	Corrupted system BIOS program. Defective system BIOS chip.
10	NVRAM shutdown register read/write error.	Defective system board.
11	Cache memory error.	Defective microprocessor.
1-2	No video adapter detected.	Defective or missing video adapter.
1-3	No monitor detected.	Defective or missing monitor.

System Error Messages

Some system error messages indicate a fatal error, in which case the system cannot usually be rebooted until an appropriate hardware change has been made. The following messages indicate a fatal error:

- 8042 Gate - A20 Error
- DMA Error
- DMA #1 Error
- DMA #2 Error
- FDD Controller Failure
- HDD Controller Failure
- INTR #1 Error
- INTR #2 Error

Table 3-2. System Error Messages

Message	Definition	Probable Causes
8042 Gate - A20 Error	Gate A20 of keyboard controller is faulty.	Defective system board.
Address Line Short!	Address decoding not properly executed on system board.	Defective system board.
C: Drive Error	No response from drive C.	Incorrect drive settings in system setup program.
C: Drive Failure	Drive C failed.	Drive C needs reformatting. Drive interface or power cable not properly connected. Defective drive interface or power cable. Defective drive C.
Cache Memory Bad. Do Not Enable Cache!	Cache memory subsystem not functioning properly.	Defective microprocessor.
CH-2 Timer Error	Error occurred in system timer 2.	Defective system board.

Table 3-2. System Error Messages (continued)

Message	Definition	Probable Causes
CMOS Battery State Low	System battery not maintaining contents of NVRAM.	System battery at or near depletion of its charge.
CMOS Checksum Failure	NVRAM checksum value changed since NVRAM contents were saved.	Battery charge may be low, or BIOS may be corrupted.
CMOS Display Type Mismatch	Video types detected by system BIOS and saved in NVRAM do not match.	Display type detected by system BIOS does not match type actually installed.
CMOS Memory Size Mismatch	Amount of main memory installed on system board does not match amount reflected by NVRAM.	Amount of main memory detected by system BIOS does not match amount actually installed.
CMOS System Options Not Set	System option parameters in NVRAM not set.	One or more configuration settings in system setup program are corrupted or improperly set.
CMOS Time and Date Not Set	System configuration settings for time and date in system setup program appear to be incorrect.	System Time and/or System Date categories in system setup program need to be reset.
D: Drive Error	No response from drive D.	Incorrect drive settings in system setup program.
D: Drive Failure	Drive D failed.	Drive D needs reformatting. Drive interface or power cable not properly connected. Defective drive interface or power cable. Defective drive D.

Table 3-2. System Error Messages (continued)

Message	Definition	Probable Causes
Diskette Boot Failure	System cannot boot from diskette in drive A.	Diskette in drive A does not contain bootable operating system, or bootable operating system is corrupt.
DMA #1 Error	Error condition occurred in DMA channel 1.	Defective system board.
DMA #2 Error	Error condition occurred in DMA channel 2.	Defective system board.
DMA Bus Time-out	Device has driven DMA bus signal longer than allowable 7.8 microseconds.	Defective system board.
DMA Error	Error condition occurred in DMA controller.	Defective system board.
FDD Controller Failure	System BIOS cannot communicate with diskette/tape drive controller.	Defective system board.
HDD Controller Failure	System BIOS cannot communicate with EIDE hard-disk drive interface or installed hard-disk drive controller card.	Defective hard-disk drive controller card (if one is installed). Defective system board. Incorrect disk settings in the system setup program.
INTR #1 Error	Failure detected in interrupt channel 1 during POST.	Defective system board.
INTR #2 Error	Failure detected in interrupt channel 2 during POST.	Defective system board.

Table 3-2. System Error Messages (continued)

Message	Definition	Probable Causes
Invalid Boot Diskette	System cannot boot from diskette in drive A.	Diskette in drive A contains no operating system. Diskette in drive A is faulty. Drive A interface or power cable faulty or improperly connected. Drive A defective.
KB/Interface Error	Error detected at key- board connector.	Keyboard improperly connected or faulty.
Keyboard Error	Keyboard has timing problem.	Keyboard improperly connected or faulty.
Keyboard is Locked... Unlock It	System cannot communicate with keyboard.	Keyboard improperly connected or faulty.
Uncorrectable ECC Error	ECC detected a multiple-bit error it could not correct.	A SIMM is faulty.

Chapter 4

Removing and Replacing Parts

This chapter provides procedures for removing and replacing components, assemblies, and subassemblies of the computer. Unless otherwise noted, each procedure assumes the following:

- The computer cover has already been removed.
- A part can be replaced by performing the removal procedure in reverse order.
- The procedures in this chapter apply to both desktop and mini tower configurations.

Precautionary Measures

Before performing any of the procedures in this chapter, read the following warning.

WARNING FOR YOUR PERSONAL SAFETY AND PROTECTION OF THE EQUIPMENT

Before you start to work on the system, perform the following steps in the sequence listed:

- 1. Turn off the computer and any attached peripherals.**
- 2. Disconnect the computer and any attached peripherals from their power sources to reduce the potential for personal injury.**
- 3. Disconnect any telephone or telecommunications lines from the computer.**
- 4. Wear a wrist grounding strap, and clip it to an unpainted metal surface, such as the security cable ring on the back of the chassis. If a wrist grounding strap is not available, touch an unpainted metal surface on the back of the computer to discharge any static charge from your body.**

Computer Cover

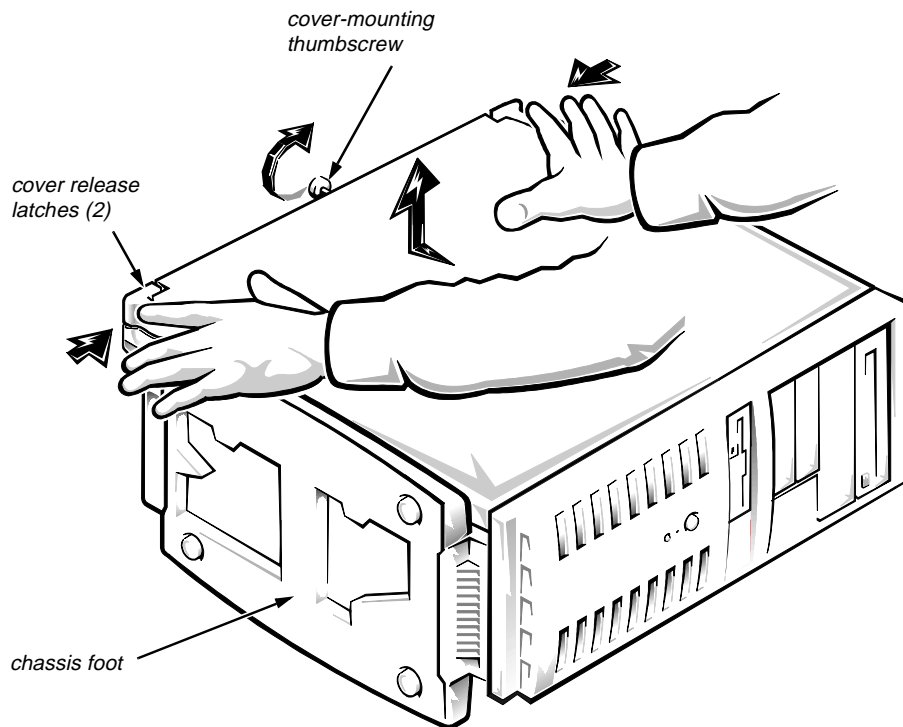


Figure 4-1. Computer Cover Removal

To remove the computer cover from a desktop or mini tower system, follow these steps:

- 1. If you are working on a mini tower system, lay the computer on its right side with the chassis foot off the edge of the work surface to allow the computer to lay flat.**
- 2. Loosen the cover-mounting thumbscrew that secures the cover to the back of the computer.**
NOTE: The thumbscrew is captive and should be retained in the cover when loosened.
- 3. Face the front of the chassis. Place both hands, palms down, near the back corners of the cover.**
- 4. Using your index fingers, push inward on the two cover release latches to release the cover.**
- 5. Slide the cover approximately one inch toward the back of the computer. Then lift the cover off the computer.**

Front Bezel

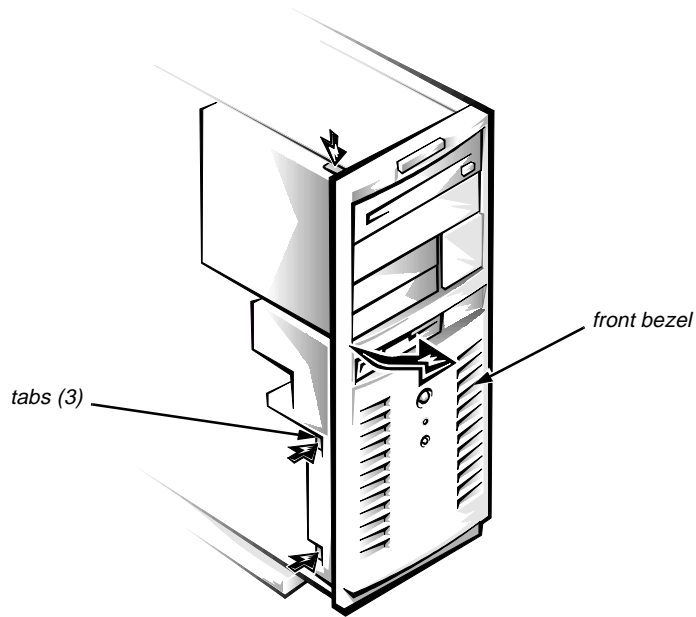


Figure 4-2. Front-Bezel Removal (Mini Tower Chassis)

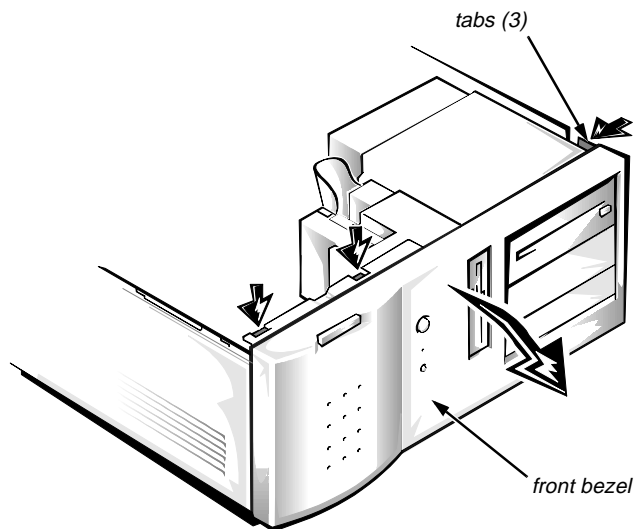


Figure 4-3. Front-Bezel Removal (Desktop Chassis)

To remove the front bezel, follow these steps:

- 1. Press the three tabs along the edge of the front bezel.**
- 2. Rotate the front bezel away from the chassis, and disengage the retaining hooks.**

Drives

The following subsections explain how to remove the front-panel inserts, drive cage, and the various types of drives in the drive bays. For additional information about drive installation and configuration, see “Installing Drives,” in the online *System User’s Guide*.

Front-Panel Insert

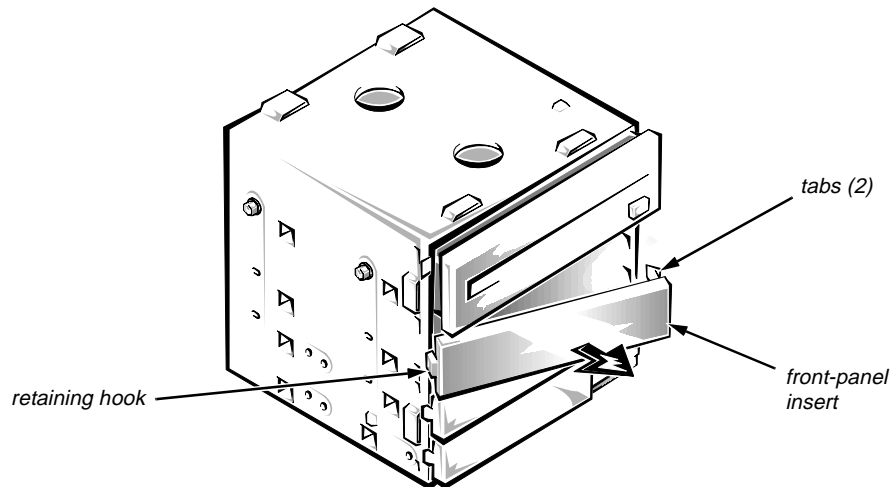


Figure 4-4. Front-Panel Insert Removal

The front-panel inserts are attached to the drive cage. Any empty bay should have a front-panel insert installed.

To remove a front-panel insert, follow these steps:

- 1. Remove the front bezel.**
- 2. Press the two tabs on the right side of the front-panel insert.**
- 3. Rotate the right side of the front-panel insert outward to disengage the retaining hook on the left side of the insert from the chassis.**

Drive Cage

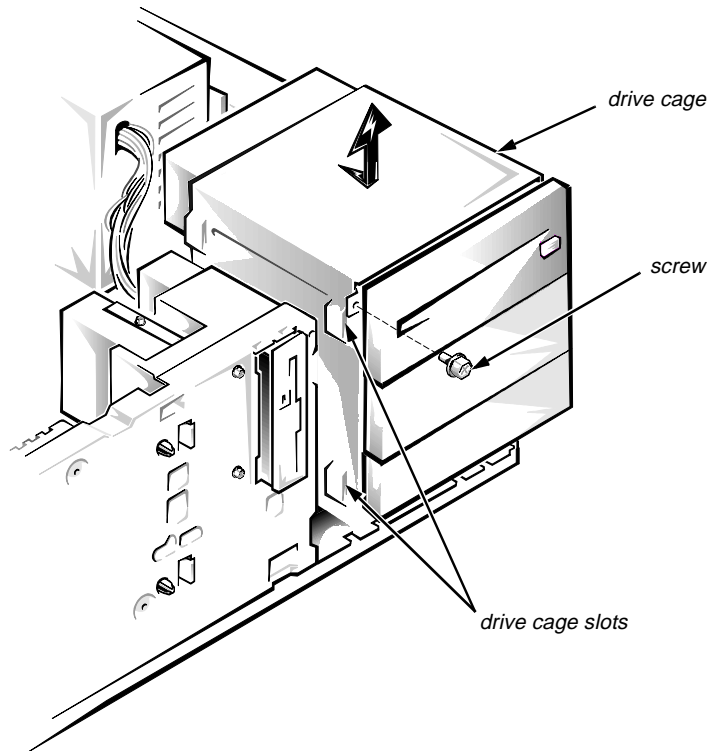


Figure 4-5. Drive Cage Removal

NOTE: The drive cage is the same in both the desktop and mini tower computers. The drive cage in the mini tower computer is mounted 90 degrees clockwise from the one shown in Figure 4-5. This rotation positions the drives horizontally when the computer is set up.

Whenever you need to remove or install a drive in the drive cage, first remove the drive cage from the chassis as follows:

- 1. Remove the front bezel.**
- 2. Note the location and orientation of all cables attached to drives installed in the drive cage. Then disconnect the cables.**
- 3. Remove the screw that secures the drive cage to the chassis.**
- 4. Slide the drive cage forward approximately one-half inch. Then lift it up and away from the chassis.**

The side of the chassis contains a detent that secures the drive cage to the side of the chassis. The drive cage may be slightly difficult to slide forward until it detaches from this detent.

5.25-Inch Drive

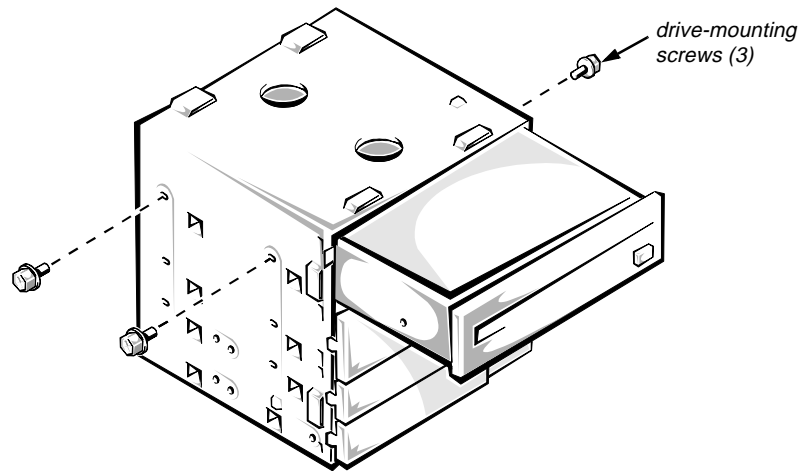


Figure 4-6. 5.25-Inch Drive Removal

To remove a drive from a 5.25-inch drive bay, follow these steps:

- 1. Remove the front bezel.**
- 2. Remove the drive cage and drives as an assembly.**
- 3. Remove the three drive-mounting screws, and slide the drive out of the bay.**

When you replace a drive, be sure to set the jumpers on the replacement drive the same as the jumpers on the drive you removed. For additional information about jumper settings on EIDE drives, see “EIDE Subsystem” in Chapter 1.

Upper 3.5-Inch Drive

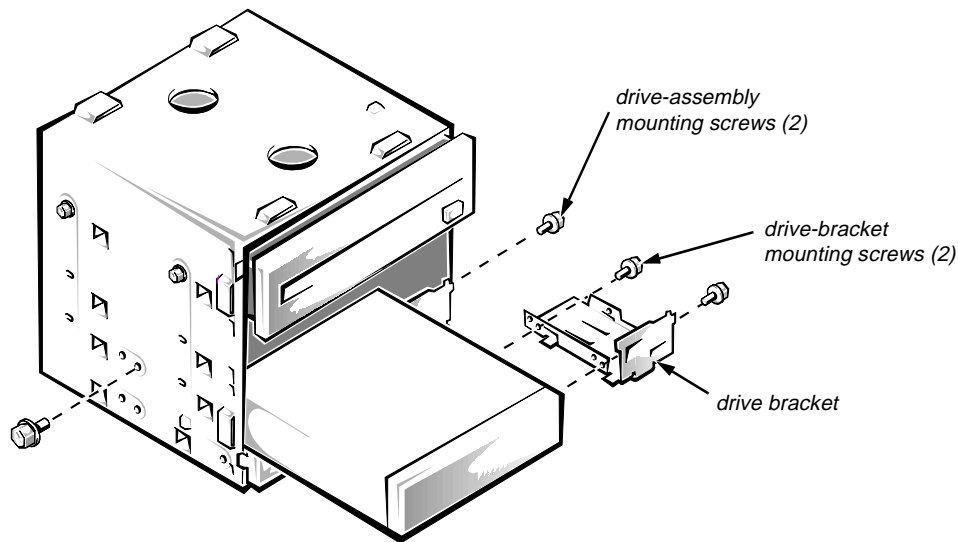


Figure 4-7. Upper 3.5-Inch Drive Removal

The upper 3.5-inch drive uses a drive bracket between the drive and the right side of the drive cage.

To remove a drive from the upper 3.5-inch drive bay, follow these steps:

- 1. Remove the front bezel.**
- 2. Remove the drive cage and drives as an assembly.**
- 3. Remove the two drive-assembly mounting screws, and slide the drive assembly out of the bay.**
- 4. Remove the two drive-bracket mounting screws, and remove the drive bracket from the drive.**

If you are working on a desktop chassis, the small plastic filler panel remains in place on the front face of the drive bracket.

When you replace a drive, be sure to set the jumpers on the replacement drive the same as the jumpers on the drive you removed. For additional information about jumper settings on EIDE drives, see “EIDE Subsystem” in Chapter 1.

Lower 3.5-Inch Drive (Mini Tower Computer Only)

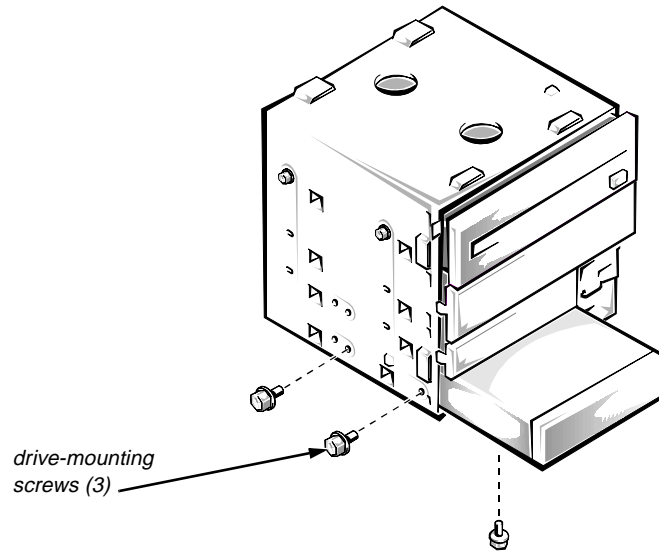


Figure 4-8. Lower 3.5-Inch Drive Removal (Mini Tower Computer Only)

The lower 3.5-inch drive attaches to the left side and bottom of the drive cage. To remove a drive from the lower 3.5-inch drive bay, follow these steps:

- 1. Remove the front bezel.**
- 2. Remove the drive cage and drives as an assembly.**
- 3. Remove the three drive-mounting screws from the left side and bottom of the drive cage, and slide the drive out of the drive cage.**

When you replace a drive, be sure to set the jumpers on the replacement drive the same as the jumpers on the drive you removed. For additional information about jumper settings on EIDE drives, see “EIDE Subsystem” in Chapter 1.

3.5-Inch Diskette Drive

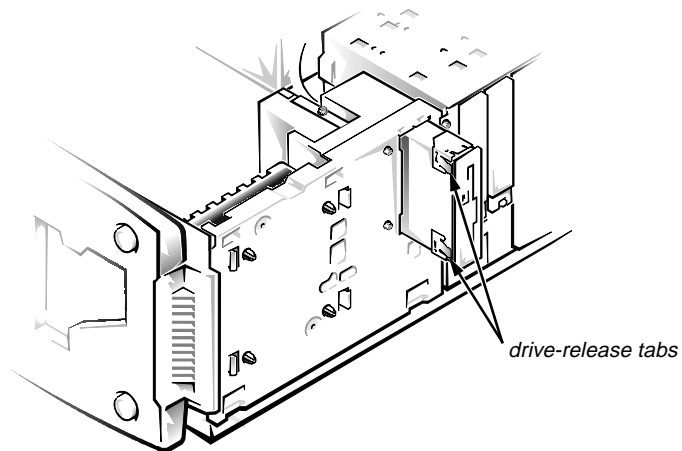


Figure 4-9. 3.5-Inch Diskette Drive Removal

To remove the 3.5-inch diskette drive, follow these steps:

- 1. Remove the front bezel.**
- 2. Disconnect the power and interface cables from the back of the 3.5-inch diskette drive.**
- 3. Press the two drive-release tabs, and slide the drive out of the bay.**

Transfer the drive-release tabs to the replacement diskette drive before installing the new drive.

Primary Hard-Disk Drive

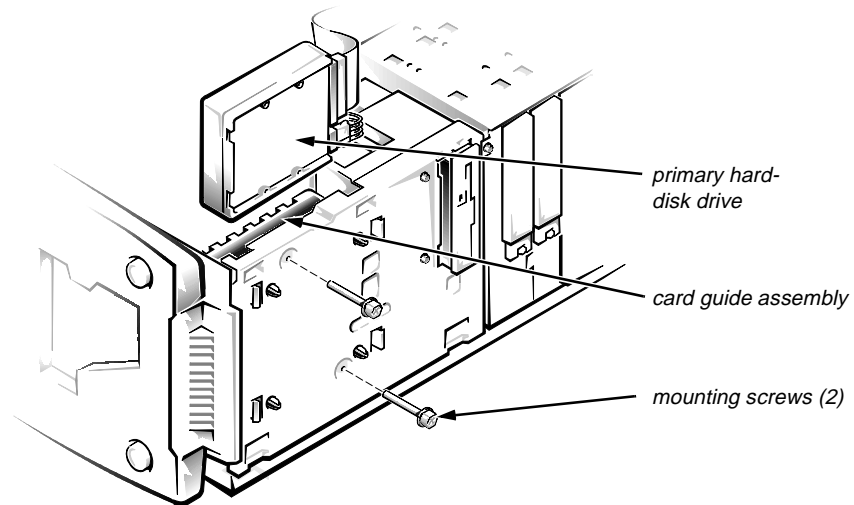


Figure 4-10. Primary Hard-Disk Drive Removal

To remove the primary hard-disk drive, follow these steps:

- 1. Remove the front bezel.**
- 2. Remove the two mounting screws.**
- 3. Lift the primary hard-disk drive out of the card guide assembly.**
- 4. Disconnect the power and interface cables from the back of the primary hard-disk drive.**

When you reinstall the primary hard-disk drive, be sure the circuit board is toward the front of the chassis.

When you replace a hard-disk drive, be sure to set the jumpers on the replacement drive the same as the jumpers on the drive you removed. For additional information about jumper settings on EIDE drives, see “EIDE Subsystem” in Chapter 1.

Secondary Hard-Disk Drive

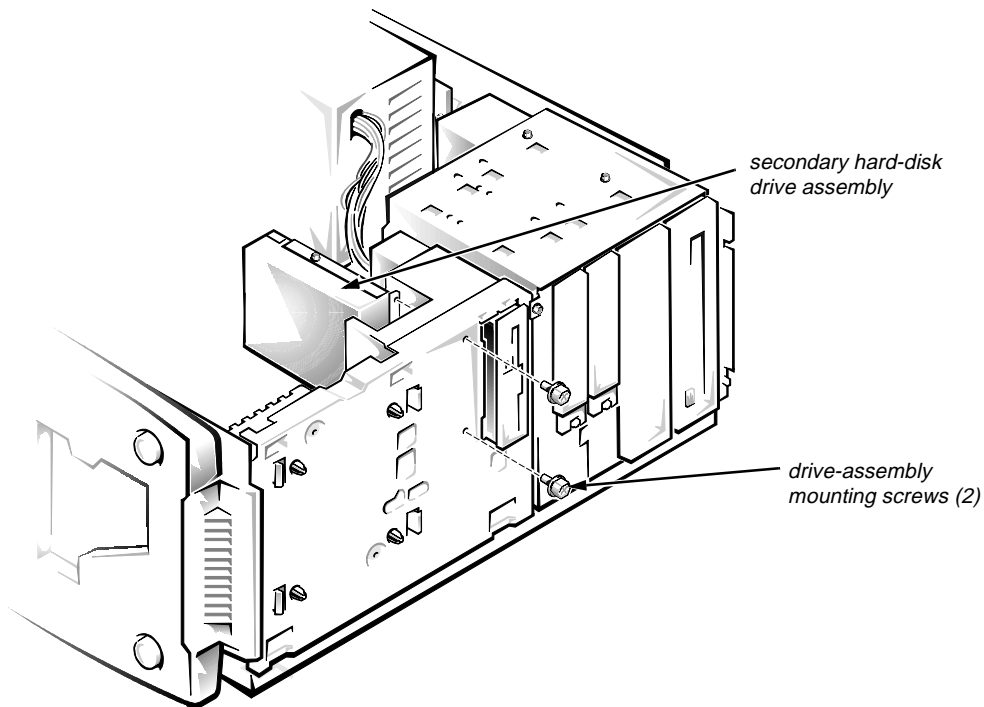


Figure 4-11. Secondary Hard-Disk Drive Assembly Removal

To remove the secondary hard-disk drive, follow these steps:

- 1. Remove the front bezel.**
- 2. Disconnect the power and interface cables from the back of the secondary hard-disk drive.**
- 3. Remove the two drive-assembly mounting screws.**
- 4. Slide the secondary hard-disk drive assembly toward the back of the chassis and lift it out.**

5. To remove the secondary hard-disk drive from the drive bracket, remove the screw from the side of the hard-disk drive, and then pivot the bracket away from the drive.

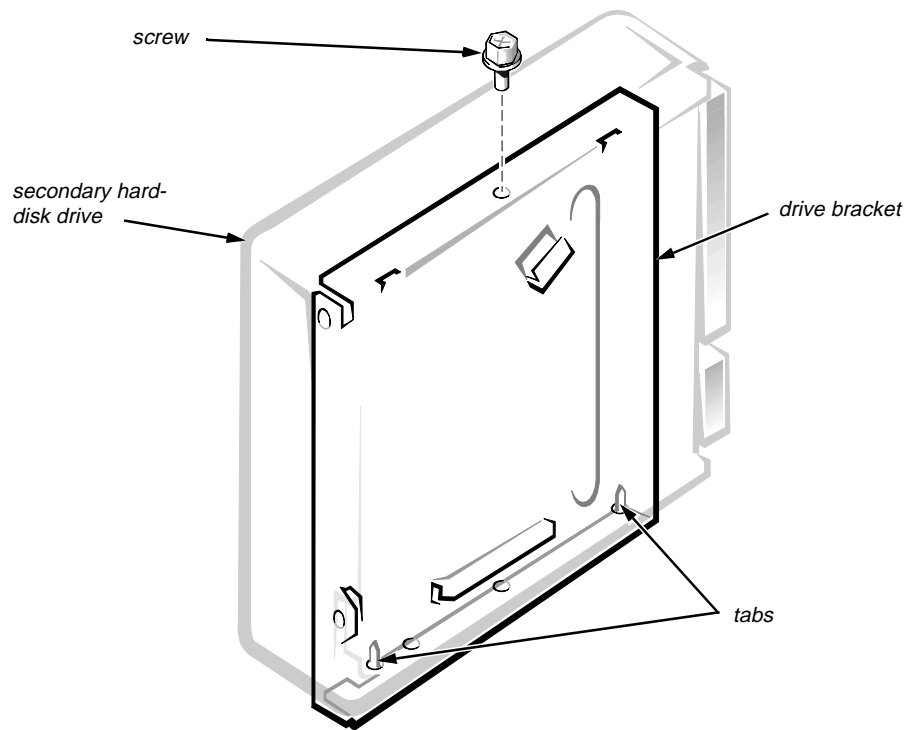


Figure 4-12. Secondary Hard-Disk Drive Removal

When you replace a hard-disk drive, be sure to set the jumpers on the replacement drive the same as the jumpers on the drive you removed. For additional information about jumper settings on EIDE drives, see “EIDE Subsystem” in Chapter 1.

When you insert the replacement hard-disk drive into the drive bracket, be sure the two tabs on the bracket fit into the mounting holes on the side of the drive.

Power Supply

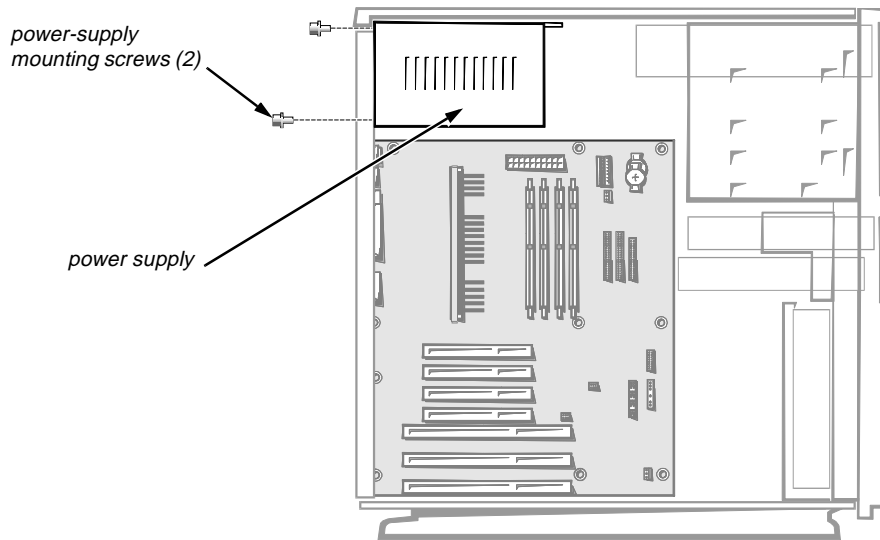


Figure 4-13. Power Supply Removal

To remove the power supply, follow these steps:

- 1. Disconnect the AC power cable at the power supply.**
- 2. Disconnect the DC power cables from the POWER and J7M1 connectors on the system board (see Figure 4-17).**
- 3. Disconnect the DC power cables from all the drives.**
- 4. Remove the two power-supply mounting screws from the back of the chassis.**
- 5. Lift the power supply out of the chassis.**

Microprocessor Fan Assembly

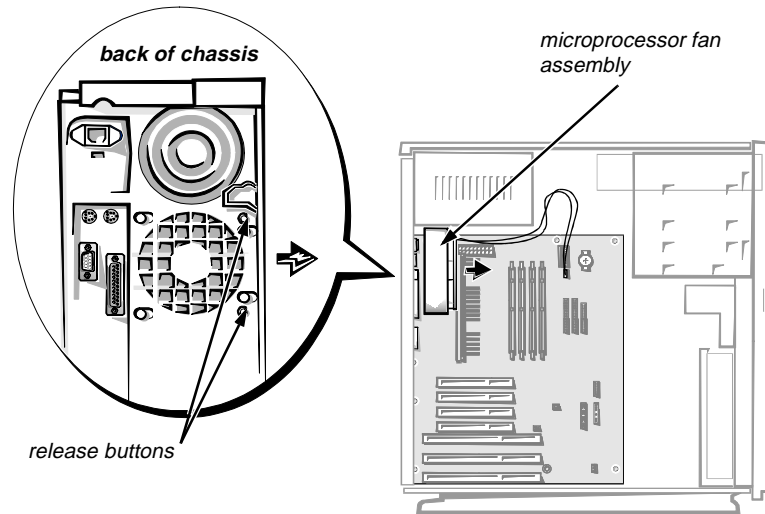


Figure 4-14. Microprocessor-Fan Assembly Removal

To remove the microprocessor fan assembly, follow these steps:

- 1. Disconnect the microprocessor fan cable from the J8L1 connector on the system board (see Figure 4-17).**
- 2. At the back of the chassis, press the two release buttons, and lift the microprocessor fan assembly out of the chassis.**

Maintain upward pressure on the fan assembly while you press the two release buttons.

Card Guide Assembly

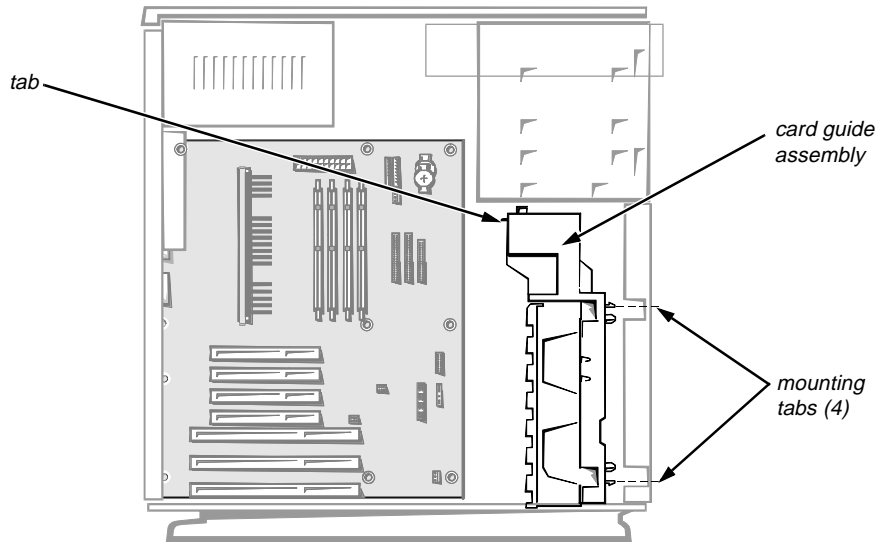


Figure 4-15. Card-Guide Assembly Removal

To remove the card guide assembly, follow these steps:

- 1. Disconnect any cables connected to full-length expansion cards, and remove these expansion cards.**
Note the location of each connector and the orientation of any cables attached to the expansion cards before disconnecting these cables.
- 2. Remove the 3.5-inch diskette drive.**
- 3. Remove the primary hard-disk drive.**
- 4. If a secondary hard-disk drive assembly is present, remove it.**
- 5. Disconnect the control panel cable from connector J9D1 on the system board (see Figure 4-17).**
- 6. Press the four mounting tabs that secure the card guide assembly to the front panel, and press on the tab at the back of the card guide assembly.**
- 7. Lift the card guide assembly, including the control panel cable, out of the chassis.**

Control Panel Board

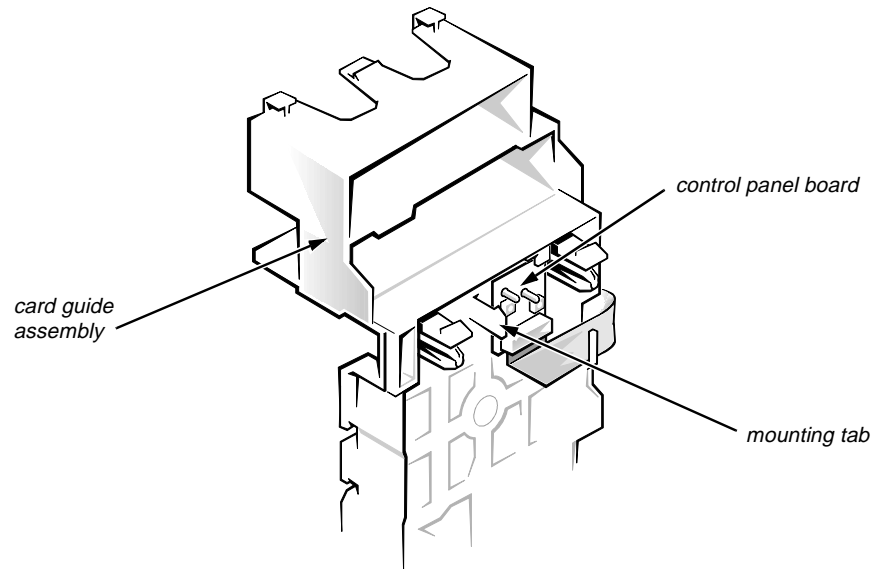


Figure 4-16. Control-Panel Board Removal

To remove the control panel board, follow these steps:

- 1. Remove the front bezel.**
- 2. Remove the card guide assembly.**
- 3. Press the mounting tab to release the control panel board from the card guide assembly, and remove the control panel board.**

System Board Components

Figure 4-17 shows the locations of components on the system board. The subsections that follow explain how to remove various system board components.

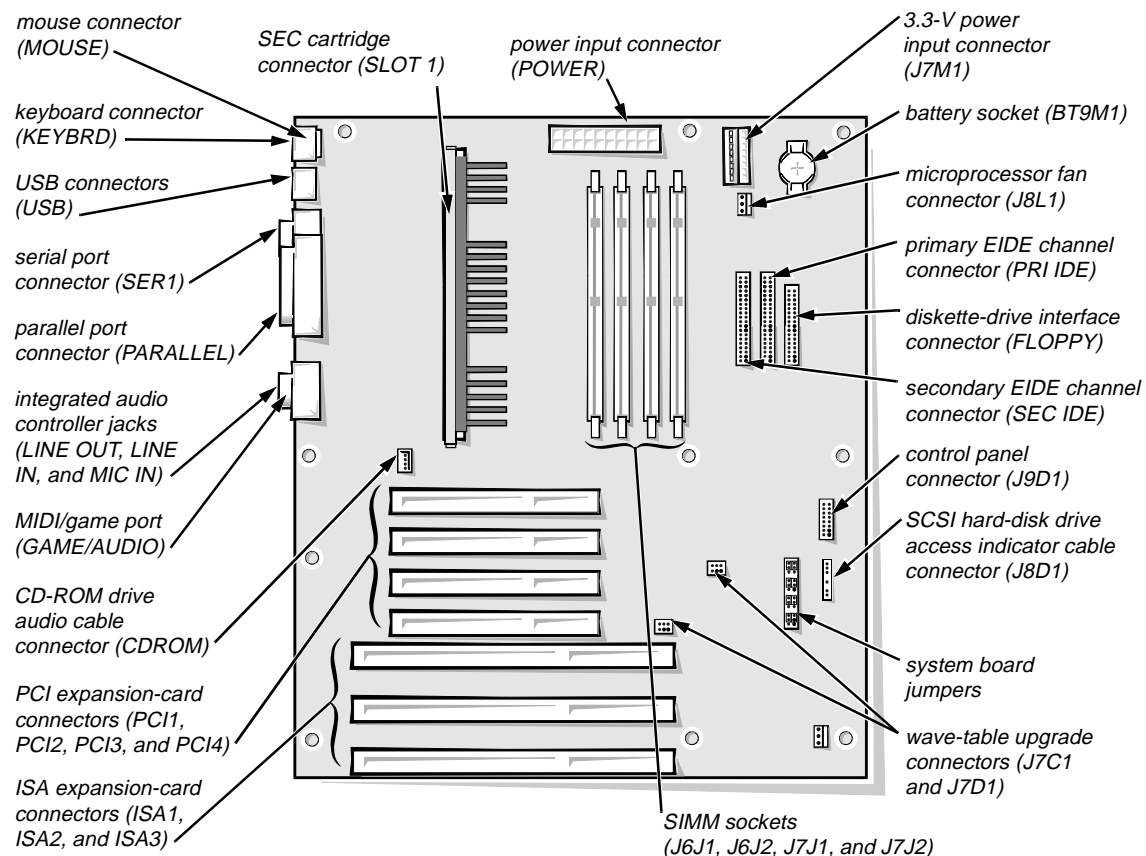


Figure 4-17. System Board Components

Expansion Cards

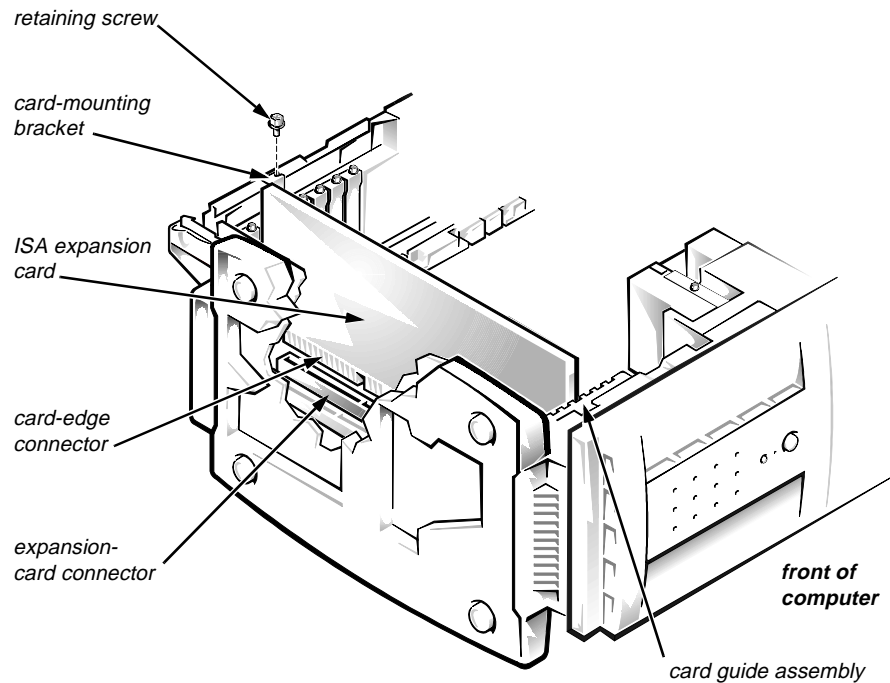


Figure 4-18. Expansion Card Removal

To remove an expansion card, follow these steps:

1. Disconnect any cables from the expansion card.

Note the location of each connector and the orientation of any cables attached to the expansion card before disconnecting these cables.

2. Remove the retaining screw from the card-mounting bracket.

3. Grasp the expansion card by its corners, and carefully pull it out of its expansion-card connector.

SIMMs

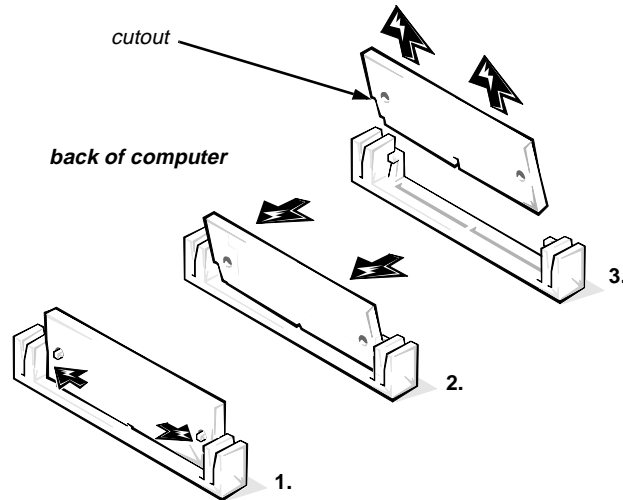


Figure 4-19. SIMM Removal

To remove a SIMM, push outward on each of the SIMM socket's metal tabs (see step 1 of Figure 4-19), and rotate the SIMM in the direction of the arrows (see steps 2 and 3 of Figure 4-19) until it is released from its socket.

To replace a SIMM, position it in its socket as shown in step 1 of Figure 4-20. While holding the SIMM's edge connector firmly against the SIMM socket, rotate it in the direction of the arrows shown in step 2 of the figure until it snaps into place.

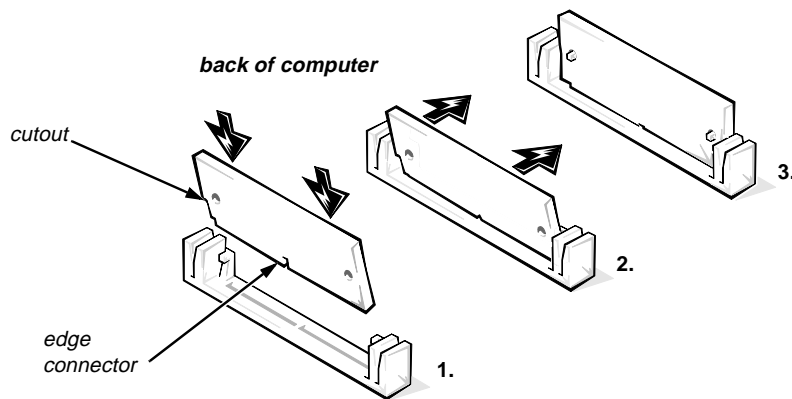


Figure 4-20. SIMM Replacement

SEC Cartridge and Heat Sink Assembly

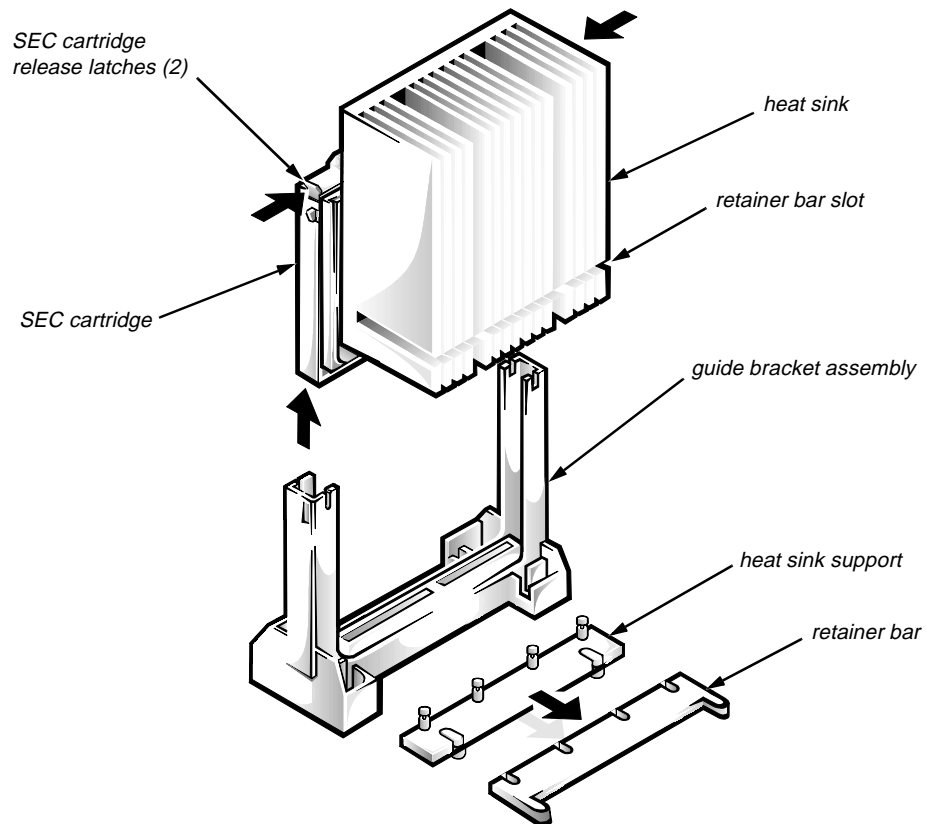


Figure 4-21. SEC Cartridge and Heat Sink Removal

WARNING: The SEC cartridge and heat sink can get extremely hot during system operation. Be sure the assembly has had sufficient time to cool before you touch it.

When handling the SEC cartridge and heat sink assembly, take care to avoid sharp edges on the heat sink.

1. Slide the retainer bar toward the front of the computer to remove it, being careful not to damage the SIMMs next to the heat sink support.
2. Press the SEC cartridge release latches until they snap into position.
3. Grasp the SEC cartridge firmly, and pull straight up on the cartridge to remove it from the guide bracket assembly.

Up to 15 pounds of force is required to disengage the SEC cartridge from the connector.

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

To install the replacement SEC cartridge and heat sink assembly, first verify that the cartridge release latches are pulled out. Then slide the SEC cartridge into the guide bracket assembly, with the heat sink toward the front of the computer, and

firmly seat the assembly. Up to 25 pounds of force is required to seat the SEC cartridge. Slide the retainer bar back into position on the heat sink support.

Battery

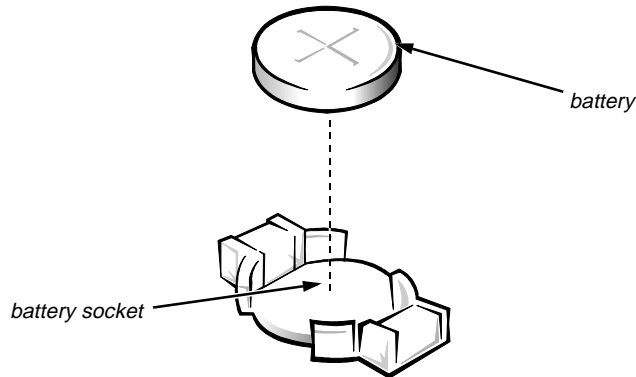


Figure 4-22. Battery Removal

WARNING: There is a danger of the new battery exploding if it is incorrectly installed. Replace the battery only with the same or equivalent type recommended by the manufacturer. Discard used batteries according to the manufacturer's instructions.

The battery is a 3.0-V, CR2032 coin-cell battery. To remove the battery, follow these steps:

- 1. If possible, enter the system setup program (see Appendix A, "System Setup Program," for instructions) and print the system setup screens.**
- 2. Remove the computer cover.**
- 3. Remove the battery by prying it out of its socket with your fingers or a blunt, nonconductive object, such as a plastic screwdriver.**

To replace the battery, install the new battery with the "+" side facing up. Then start the system setup program, and reset the System Date and System Time categories. Compare the system configuration settings with the copy made in step 1. Restore any system configuration information that was lost while replacing the battery.

System Board

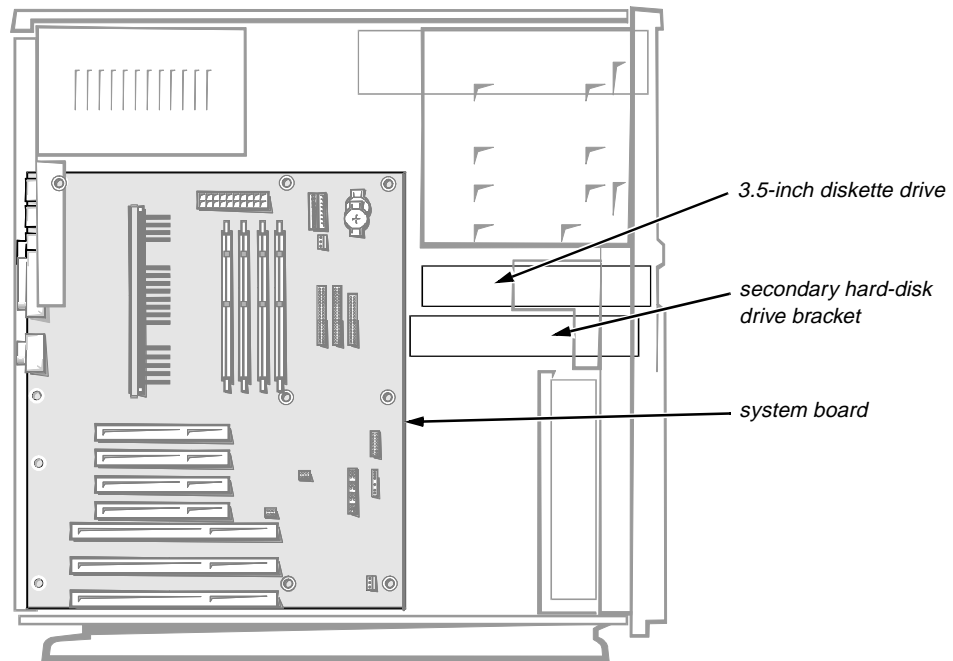


Figure 4-23. System Board Removal

- 1. Disconnect any cables attached to the I/O panel on the back of the computer.**
- 2. Remove any installed expansion cards.**
- 3. Remove the 3.5-inch diskette drive.**
- 4. If there is a secondary hard-disk drive, remove it.**
- 5. Disconnect all internal cables from the system board.**

The cables attached to the PRI IDE, SEC IDE, and FLOPPY connectors (see Figure 4-18) each have two latches securing them to the system board. Press the latch on each end of the cable connector, and pull to release the cable from the system board.

- 6. Remove the screws that secure the system board to the chassis (see Figure 4-24).**
- 7. Carefully lift the system board out from the plastic standoffs (see Figure 4-24), and remove the board from the chassis.**

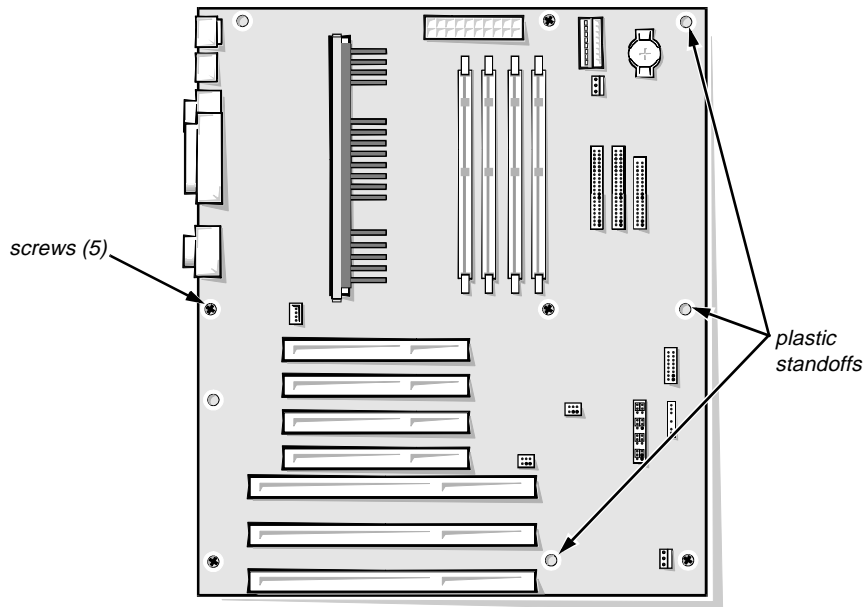


Figure 4-24. System Board Mountings

- 8. Place the system board on a level surface. Protect the surface with an antistatic bag or other protective material.**
- 9. Remove the SEC cartridge and heat sink assembly as described in “SEC Cartridge and Heat Sink Assembly” found earlier in this chapter.**

The SEC cartridge and heat sink assembly is more accessible when the system board has been removed from the chassis, but it is necessary to stabilize the board due to the forces required to remove components.

- 10. Remove the guide bracket assembly for the SEC cartridge.**

NOTE: The four nuts are captive and should be retained in the assembly when loosened.

Using a #2 Phillips screwdriver, loosen each of the four nuts (see Figure 4-25) securing the guide bracket assembly to the system board. Remove the assembly from the four threaded posts.

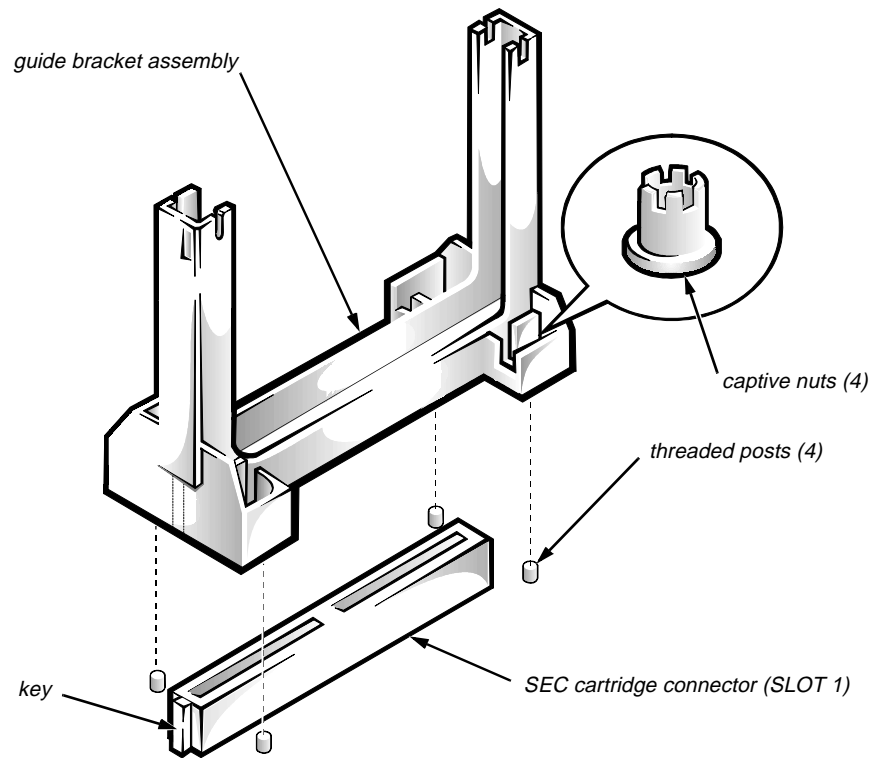


Figure 4-25. Guide-Bracket Assembly Removal

To install a replacement system board, install the guide bracket assembly for the SEC cartridge. The assembly is keyed for correct insertion (see Figure 4-25). Then install the SEC cartridge and heat sink assembly. Transfer the SIMMs to the new system board, and set the configuration jumpers to match the old system board.

When installing the new system board in the computer, push the system board against the back of the chassis so that the system board makes firm contact with the I/O gasket to prevent EMI leakage.

CAUTION: Failure to install the system board exactly as described may result in EMI leakage that could interfere with other electronic devices.

Appendix A

System Setup Program

This appendix describes the system setup program, which is used to change the system configuration information stored in CMOS and NVRAM on the system board.

To enter the system setup program, follow these steps:

1. **Turn on (or reboot) the system.**
2. **When prompted, press *immediately*.**

If you wait too long and the operating system begins to load into memory, *let the system complete the load operation*. Then shut down the system and try again.

NOTE: To ensure an orderly system shutdown, consult the documentation that accompanied the operating system.

System Setup Screens

The system setup program consists of a number of menus and submenus with configuration options and information. The menu bar provides access to the following five screens:

- Main screen — Provides settings for the basic system configuration
- Advanced screen — Provides detailed settings for some system features
- Security screen — Provides indications and settings for system password and setup password
- Power screen — Provides settings for system power-management features
- Exit screen — Provides selections for saving and loading the configurations and options

In addition to these screens, options identified by a right arrow (see Figure A-1 for an example) provide access to submenus.

Main Screen

Dell Dimension XPS H233 Setup		
Main	Advanced	Security Power Exit
System Time:	[09:39:55]	Item Specific Help
System Date:	[11/26/1996]	
Diskette A:	[1.44/1.25 Mb 3½"]	
Diskette B:	[Not Installed]	
▶ Primary IDE Master	[ST32140A]	
▶ Primary IDE Slave	[Not Installed]	
▶ Secondary IDE Master	[FX120T]	
▶ Secondary IDE Slave	[Not Installed]	
▶ Boot Options	[Press Enter]	
Video Mode	EGA/VGA	
Base Memory	640 KB	
Extended Memory	31 MB	
Service Tag	66H1G	
BIOS Version	0.01.01.DTOJ (A00)	
F1 Help	↑↓ Select Item	-/+ Change Values
ESC Back	↔ Select Menu	Enter Select ▶ Submenu
		F9 Setup Defaults
		F10 Previous Values

Figure A-1. Main Screen

Table A-1. Main Screen Categories

Category	Function
System Time	Resets time on system's internal clock.
System Date	Resets date on system's internal calendar.
Diskette A	Identifies the boot diskette drive in your computer. The default is 1.44/1.25 Mb 3½".
Diskette B	Identifies a second diskette drive in your computer.
Primary IDE Master	Identifies the first drive attached to the primary EIDE interface, usually the boot hard-disk drive. See the "Device Configuration Submenu" subsection in this appendix.
Primary IDE Slave	Identifies the second drive attached to the primary EIDE interface, usually a second hard-disk drive. See the "Device Configuration Submenu" subsection in this appendix.
Secondary IDE Master	Identifies the first drive attached to the secondary EIDE interface, usually a CD-ROM or tape drive. See the "Device Configuration Submenu" subsection in this appendix.

Table A-1. Main Screen Categories (continued)

Category	Function
Secondary IDE Slave	Identifies the second drive attached to the secondary EIDE interface, usually a CD-ROM or tape drive. See the “Device Configuration Submenu” subsection in this appendix.
Boot Options	Displays a submenu. See the “Boot Options Submenu” subsection in this appendix.
Video Mode	Displays the video mode detected by the system.
Base Memory	Displays the maximum amount of memory available to MS-DOS programs that do not use expanded or extended memory. To change the amount of base memory, see the “Chipset Configuration Submenu” subsection in this appendix.
Extended Memory	Displays the amount of system memory available as extended memory.
Service Tag	Displays system’s service tag number.
BIOS Version	Displays the version of the BIOS being used.

IDE Device Configuration Submenu

Dell Dimension XPS H233 Setup	
Main	
Primary IDE Master [ST32140A]	Item Specific Help
IDE Device Configuration [Auto Configured]	
Cylinders 4095	
Heads 16	
Sectors 63	
Maximum Capacity 2016 MB	
Fast Programmed I/O Modes [Auto Detected]	
F1 Help ↑↓ Select Item -/+ Change Values	F9 Setup Defaults
ESC Back ↔ Select Menu Enter Select ► Submenu	F10 Previous Values

Figure A-2. IDE Device Configuration Submenu

Table A-2. IDE Device Configuration Submenu Categories

Category	Function
IDE Device Configuration	Configures individual EIDE drives. For most EIDE drives, you should select the Auto Configured option, unless you are using a hard-disk drive that does not support the autodetect feature. In this case, select User Definable and enter the appropriate values in the Cylinders, Heads, Sectors, and Maximum Capacity fields. For a non-IDE drive, set this category to Disabled.
Fast Programmed I/O Modes	Enables or disables the use of programmed I/O, which can improve the performance of a hard-disk drive. If you select Auto Detected (the default), the system BIOS uses the fastest programmed I/O protocol supported. If you select Disabled, programmed I/O is turned off.

Boot Options Submenu

Dell Dimension XPS H233 Setup

Main		Boot Options [Press Enter]		Item Specific Help
First Boot Device	[Floppy]			
Second Boot Device	[Hard Disk]			
Third Boot Device	[Disabled]			
Fourth Boot Device	[Disabled]			
System Cache	[Enabled]			
System Speed	[Fast]			
Num Lock	[Off]			
Floppy Access	[Read/Write]			
Setup Prompt	[Enabled]			
Hard Disk Pre-Delay	[Disabled]			
Typematic Rate Programming	[Default]			
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults	
ESC Back	↔ Select Menu	Enter Select ► Submenu	F10 Previous Values	

Figure A-3. Boot Options Submenu

Table A-3. Boot Options Submenu Categories

Category	Function
First Boot Device	<p>Determines which device the system tries to boot from first. Options for this category are as follows:</p> <ul style="list-style-type: none"> • Floppy — Diskette drive A • Hard Disk — A hard-disk drive connected to the primary EIDE channel • CD-ROM — A CD-ROM drive • Network — A drive on the network server • Disabled — First boot device not available
Second Boot Device	<p>Determines which device the system tries to boot from if it cannot boot from the device selected for First Boot Device. Options for this category are the same as for the First Boot Device.</p>
Third Boot Device	<p>Determines which device the system tries to boot from if it cannot boot from the devices selected for First Boot Device and Second Boot Device. Options for this category are the same as for the First Boot Device.</p>

Table A-3. Boot Options Submenu Categories (continued)

Category	Function
Fourth Boot Device	Determines which device the system tries to boot from if it cannot boot from the devices selected for First Boot Device, Second Boot Device, and Third Boot Device. Options for this category are the same as for the First Boot Device.
System Cache	Enables or disables the secondary cache memory.
System Speed	Specifies the processor speed at which your system boots and runs. Options for this category are Fast (for the microprocessor's rated speed) and Compatible, which helps accommodate speed-sensitive application programs by disabling all cache memory.
Num Lock	Determines whether keyboard's Num Lock mode is activated at boot.
Floppy Access	Determines whether your system can write data to a diskette inserted in a diskette drive. Options are Read/Write and Read Only.
Setup Prompt	Enables (the default) or disables the prompt to enter the system setup program during the boot routine.
Hard Disk Pre-Delay	Enables or disables (the default) a delay before the BIOS accesses a hard-disk drive to avoid accessing the drive before it has been initialized. Only older hard-disk drives may need this delay.
Typematic Rate Programming	Controls the amount of time a key must be pressed before the key-repeat function starts and how many characters per second are output once the key-repeat function has started.

Advanced Screen

Dell Dimension XPS H233 Setup				
Main	Advanced	Security	Power	Exit
<p>Setup Warning</p> <p>Setting items on this menu to incorrect values may cause your system to malfunction.</p> <p>Processor Type Pentium(R) II chip Processor Speed 233 MHz Cache Size 512K</p> <p>▶ Peripheral Configuration [Press Enter] ▶ Chipset Configuration [Press Enter] ▶ Plug and Play Configuration [Press Enter]</p>				Item Specific Help
F1 Help	ESC Back	↑↓ Select Item ↔ Select Menu	-/+ Change Values Enter Select ▶ Submenu	F9 Setup Defaults F10 Previous Values

Figure A-4. Advanced Screen

Table A-4. Advanced Screen Categories

Category	Function
Processor Type	Displays type of microprocessor installed.
Processor Speed	Displays internal speed of the microprocessor.
Cache Size	Indicates the amount of secondary cache memory installed.
Peripheral Configuration	Displays a submenu. See the “Peripheral Configuration Submenu” subsection in this appendix.
Chipset Configuration	Displays a submenu. See the “Chipset Configuration Submenu” subsection in this appendix.
Plug and Play Configuration	Displays a submenu. See the “Plug and Play Configuration Submenu” subsection in this appendix.

Peripheral Configuration Submenu

Dell Dimension XPS H233 Setup	
Advanced	
Peripheral Configuration [Press Enter]	Item Specific Help
Primary PCI IDE Interface	[Auto Configured]
Secondary PCI IDE Interface	[Auto Configured]
Floppy Interface	[Auto Configured]
Serial Port 1 Interface	[Auto Configured]
Parallel Port Interface	[Auto Configured]
Parallel Port Type	[Bi-directional]
USB Interface	[Enabled]
Audio Interface	[Enabled]
Primary PCI IDE Status	Enabled
Secondary PCI IDE Status	Enabled
Floppy Status	Enabled
Serial Port 1 Status	COM1 3F8 IRQ4
Parallel Port Status	LPT1 378 IRQ7
F1 Help	↑↓ Select Item
ESC Back	↔ Select Menu
-/+ Change Values	Enter Select ► Submenu
F9 Setup Defaults	F10 Previous Values

Figure A-5. Peripheral Configuration Submenu

Table A-5. Peripheral Configuration Submenu Categories

Category	Function
Primary PCI IDE Interface	Configures the primary EIDE interface on the system board. Options for this category are Auto Configured (the default) and Disabled.
Secondary PCI IDE Interface	Configures the secondary EIDE interface on the system board. Options for this category are Auto Configured (the default) and Disabled.
Floppy Interface	Configures the diskette/tape drive interface on the system board. Options for this category are Auto Configured (the default), Enabled (which locks the interface at I/O port address 3F0h–3F5h), and Disabled.
Serial Port 1 Interface	Configures the built-in serial port on the system board. You can set this category to Auto Configured (the default) or to Disabled, or you can select a specific port designation, I/O address, and IRQ line for the port. The available port designations are COM1, COM2, COM3, and COM4; available I/O addresses are 3F8h, 3E8h, 2F8h, and 2E8h; and available interrupts are IRQ3 and IRQ4.

Table A-5. Peripheral Configuration Submenu Categories (continued)

Category	Function
Parallel Port Interface	Configures the built-in parallel port on the system board. Set this category to Auto Configured (the default) or to Disabled, or select a specific port designation, I/O address, and IRQ line for the port. The available port designations are LPT1, LPT2, and LPT3; available I/O addresses are 378h, 278h, and 3BCh; and available interrupts are IRQ7 and IRQ5.
Parallel Port Type	Controls the mode used by the system's built-in parallel port. Options for this category are: <ul style="list-style-type: none"> • Compatible — For a unidirectional device • Bi-directional — For a bidirectional device • ECP — For an ECP device • EPP — For an EPP device (not supported)
USB Interface	Determines whether the USB connectors are Enabled (the default) or Disabled. If this category is set to Enabled, the system dynamically allocates an IRQ for the USB connectors according to the PCI specification.
Audio Interface	Determines whether the integrated audio controller is Enabled (the default) or Disabled. Set this category to Disabled to use a sound expansion card instead of the integrated audio controller.
Primary PCI IDE Status	Indicates whether the primary EIDE interface is enabled or disabled.
Secondary PCI IDE Status	Indicates whether the secondary EIDE interface is enabled or disabled.
Floppy Status	Indicates whether the diskette/tape drive interface is enabled or disabled.
Serial Port 1 Status	Indicates whether the serial port is enabled or disabled; displays configuration settings if enabled.
Parallel Port Status	Indicates whether the parallel port is enabled or disabled; displays configuration settings if enabled.

Chipset Configuration Submenu

Dell Dimension XPS H233 Setup	
Advanced	
Chipset Configuration [Press Enter]	Item Specific Help
Base Memory [640 KB]	
Latency Timer (PCI Clocks) [Auto Configured]	
Bank 0 EDO	
Bank 1 Not Installed	
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Back ↔ Select Menu Enter Select ► Submenu F10 Previous Values	

Figure A-6. Chipset Configuration Submenu

Table A-6. Chipset Configuration Submenu Categories

Category	Function
Base Memory	Displays the maximum amount of memory available to MS-DOS programs that do not use expanded or extended memory. Options for this category are 640 KB (the default) and 512 KB.
Latency Timer (PCI Clocks)	Specifies how quickly a PCI card is guaranteed to have access to the PCI bus. The value for this category can be set to Auto Configured (the default) or to a specific PCI clock-cycle value in increments of eight from 16 to 128.
Bank 0	Indicates the type of SIMMs installed in the first pair of SIMM sockets (J6J1 and J6J2).
Bank 1	Indicates the type of SIMMs installed in the second pair of SIMM sockets (J7J1 and J7J2), if any.

Plug and Play Configuration Submenu

Dell Dimension XPS H233 Setup	
Advanced	
Plug and Play Configuration [Press Enter]	Item Specific Help
Configuration Mode [Use BIOS Setup]	
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Back ↔ Select Menu Enter Select ► Submenu F10 Previous Values	

Figure A-7. Plug and Play Configuration Submenu

Table A-7. Plug and Play Configuration Submenu Categories

Category	Function
Configuration Mode	<p>Configuration Mode determines whether the system configures Plug-and-Play devices through the system BIOS or through the operating system. Options are Use BIOS Setup and Use PnP OS.</p> <p><i>NOTE: The Configuration Mode setting determines what other categories are displayed on the Plug and Play Configuration submenu. If Configuration Mode is set to Use BIOS Setup, the ISA Shared Memory Size and IRQ categories are available. If Use PnP OS is selected, the PnP OS category appears.</i></p>
ISA Shared Memory Size	<p>ISA Shared Memory Size specifies the size of the shared memory range for ISA expansion cards. Options are Disabled, 16KB, 32KB, 48KB, 64KB, 80KB, and 96KB.</p>
IRQ	<p>The IRQ categories enable you to reserve unused IRQs for use by an ISA device.</p>
PnP OS	<p>PnP OS determines which Plug-and-Play-compatible operating system the computer system is configured to use. Options are Windows 95 and Other PnP OS.</p>

Security Screen

Dell Dimension XPS H233 Setup					
Main	Advanced	Security	Power	Exit	
Security					Item Specific Help
System Password		Installed			
Setup Password		Not Installed			
Enter System Password		[Press Enter]			
Enter Setup Password		[Press Enter]			
Password Status		[Unlocked]			
F1 Help	↑↓ Select Item	-/+ Change Values	F9 Setup Defaults		
ESC Back	↔ Select Menu	Enter Select ► Submenu	F10 Previous Values		

Figure A-8. Security Screen

Table A-8. Security Screen Categories

Category	Function
System Password	Indicates whether a system password has been assigned.
Setup Password	Indicates whether a setup password has been assigned.
Enter System Password	Allows you to assign, change, or clear a system password. <i>NOTE: The system password cannot be assigned, changed, or cleared if the Password Status category is set to Locked.</i>
Enter Setup Password	Allows you to assign, change, or clear a setup password. The setup password can be used both to gain access to the computer system and to make changes in the system setup program.
Password Status	<i>NOTE: Some computer systems do not display this category.</i> When Setup Password is set to Installed, setting Password Status to Locked prevents an assigned system password from being changed or cleared.

Power Screen

Dell Dimension XPS H233 Setup

Main		Advanced		Security		Power		Exit	
Advanced Power Management						[Enabled]		Item Specific Help	
IDE Drive Power Down						[Enabled]			
VESA Video Power Down						[Sleep]			
Inactivity Timer (Minutes)						[10]			
Hot Key (CTRL-ALT-)						[]			
Auto Start On AC Loss						[Enabled]			
F1	Help	↑↓	Select Item	-/+	Change Values	F9	Setup Defaults		
ESC	Back	↔	Select Menu	Enter	Select ► Submenu	F10	Previous Values		

Figure A-9. Power Screen

Table A-9. Power Screen Categories

Category	Function
Advanced Power Management	Enables or disables all the other categories on the Power screen.
IDE Drive Power Down	When set to Enabled (the default), IDE Drive Power Down allows most EIDE hard-disk drives to automatically switch into low-power mode after a specified period of system inactivity (called a <i>time-out</i>). The time-out period is set with the Inactivity Timer category. When the IDE Drive Power Down category is set to Disabled, hard-disk drives do not switch into low-power mode.

Table A-9. Power Screen Categories (continued)

Category	Function
VESA Video Power Down	<p><i>NOTES: For the Windows 95 operating system, use the Display Properties dialog box in the Control Panel to save monitor power rather than using the VESA Video Power Down category. See the Windows 95 online help for instructions.</i></p> <p><i>This category is available only if the installed video card supports this feature.</i></p> <p>CAUTION: Before enabling this feature, check the monitor documentation to make sure the monitor is DPMS-compliant; otherwise, there is a risk of damaging the monitor.</p> <p>VESA Video Power Down selects the amount of monitor power saved when Advanced Power Management is enabled and the system has entered a time-out period. Options for this category and the amount of power saved are:</p> <ul style="list-style-type: none">• Standby: 20% power saved (the default)• Suspend: 90% power saved• Sleep: 95% power saved <p>The higher the percentage of monitor power saved, the longer the monitor takes to return to full power when the time-out period ends.</p>
Inactivity Timer	<p>Determines the period of system inactivity before certain system components enter a low-power mode. To disable power management, set this field to 0.</p>
Hot Key	<p>Allows the user to define a key combination that causes the system to immediately enter a low-power mode until the next time the keyboard or mouse is used. The user defines a key to use in combination with <Ctrl> and <Alt> as the power key combination.</p>
Auto Start On AC Loss	<p>When set to Enabled, Auto Start On AC Loss allows the system to automatically restart if there is a momentary loss of AC power. If this category is set to Disabled, you must restart the system manually after a loss of AC power.</p>

Exit Screen

Dell Dimension XPS H233 Setup

Main	Advanced	Security	Power	Exit	
Exit Saving Changes [Press Enter] Exit Discarding Changes [Press Enter] Load Setup Defaults [Press Enter] Discard Changes [Press Enter] Save Changes [Press Enter]					Item Specific Help
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults ESC Back ↔ Select Menu Enter Execute Command F10 Previous Values					

Figure A-10. Exit Screen

Table A-10. Exit Screen Categories

Category	Function
Exit Saving Changes	Saves any changes you have made, exits the system setup program, and restarts the system
Exit Discarding Changes	Discards any changes you have made, exits the system setup program, and restarts the system
Load Setup Defaults	Discards any changes you have made, reverts all categories to their original default settings, but does not exit the system setup program
Discard Changes	Discards any changes you have made, reverts all categories to their last saved settings, but does not exit the system setup program
Save Changes	Saves any changes you have made but does not exit the system setup program

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