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# HP Omnibook XE4400

Technology Code KD

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## Service Manual

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## Edition History

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## Introduction

This manual provides reference information for servicing an HP Omnibook XE4400 (technology code KD) notebook computer. It is for use by HP-authorized service personnel while installing, servicing, and repairing this product.

The manual is designed as a self-paced guide that will train you to install, configure, and repair this notebook. The manual is self-contained, so you can follow it even without having equipment available.

The following table lists other sources of information about the notebook computer and related products.

Source	Address or Number	Comments
HP Notebook Web Site	<a href="http://www.hp.com/notebooks">http://www.hp.com/notebooks</a> ( <a href="http://www.europe.hp.com/notebook">http://www.europe.hp.com/notebook</a> , European mirror)	
HP Business Support web Site	<a href="http://www.hp.com/go/bizsupport">www.hp.com/go/bizsupport</a>	
HP Partnership Web	<a href="http://partner.americas.hp.com">http://partner.americas.hp.com</a>	Restricted to Authorized Resellers only.
HP Asia Pacific Channel Support Centre for DPSP Partners	<a href="http://www.hp.com.au">http://www.hp.com.au</a>	Restricted to DPSP Partners only.
HP/MCD web site	<a href="http://www.mcd.hp.com">http://www.mcd.hp.com</a>	HP's internal web site for division information.
America Online	Keyword: HP	Call (800) 827-6364 for membership within the US.
CompuServe	GO HP	Call (800) 524-3388 for membership within the US.
HP Support Assist CD-ROM	(800) 457-1762	US and Canada.
	(801) 431-1587	Outside US and Canada.
Microsoft Windows manual		Information about Windows operating system.
Microsoft Web	<a href="http://www.microsoft.com">http://www.microsoft.com</a>	Information and updates for Windows operating systems.





## Product Information

The HP Omnibook XE4400 notebook computer provides outstanding performance and expandability in a conveniently portable form. The notebook's high-performance components use the latest technologies to enable it to serve as a desktop computer or a portable multimedia presentation tool. Note that the following list of products is current at the time of publication but is subject to change.

**Table 1-1. Omnibook XE4400 Notebook**

Omnibook Product *	CPU	Display	Hard Drive	CD/DVD Drives	Standard SDRAM/ Video Mem	Communication	Battery
F4666 J/H	Pentium 4-DT 1.8 GHz	14.1-in XGA	20 GB	DVD	256 MB/32 MB	Modem/LAN	Li-Ion
F4667 J/H	Pentium 4-DT 2.0 GHz	15-in XGA	30 GB	CDRW/DVD	256 MB/32 MB	Modem/LAN	Li-Ion
F4670 J/H	Pentium 4-DT 1.8 GHz	14.1-in XGA	20 GB	DVD	256 MB/16 MB	Modem/LAN	Li-Ion
F4671 J/H	Pentium 4-DT 2.0 GHz	15-in XGA	30 GB	CDRW/DVD	256 MB/16 MB	Modem/LAN	Li-Ion
F4673 J/H	Pentium 4-DT 1.8 GHz	15-in SXGA+	30 GB	CD	256 MB/32 MB	Modem/LAN	Li-Ion
F4674 J/H	Pentium 4-DT 2.0 GHz	15-in SXGA+	40 GB	CDRW/DVD	512 MB/32 MB	Modem/LAN	Li-Ion

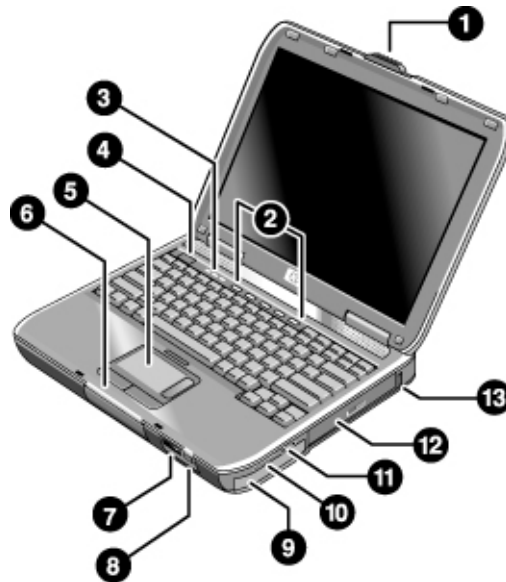
This table lists only base product configurations—custom configurations are not included.

\* The J/H suffix indicates the notebook's OS: J = Windows XP Professional with Windows 2000 Recovery CDs, H = Windows XP Home.

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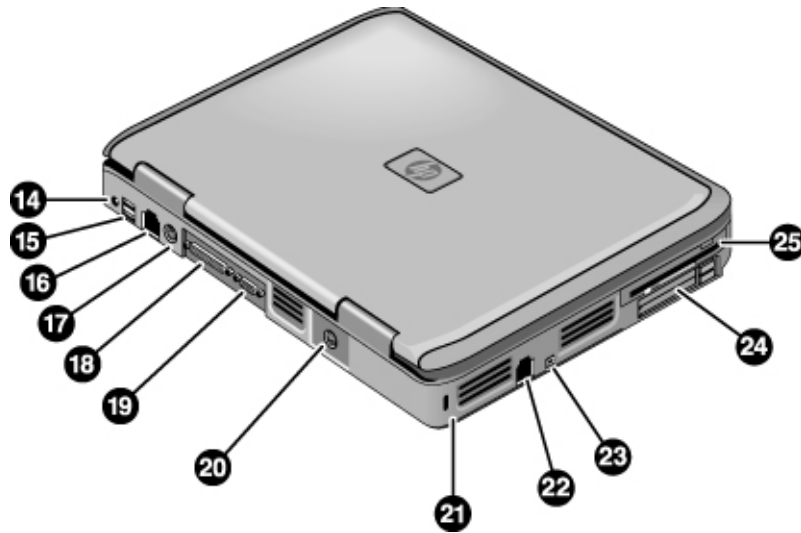
## Features

The following three illustrations show the notebook's main external features. For an exploded view of the notebook, see page 4-2.



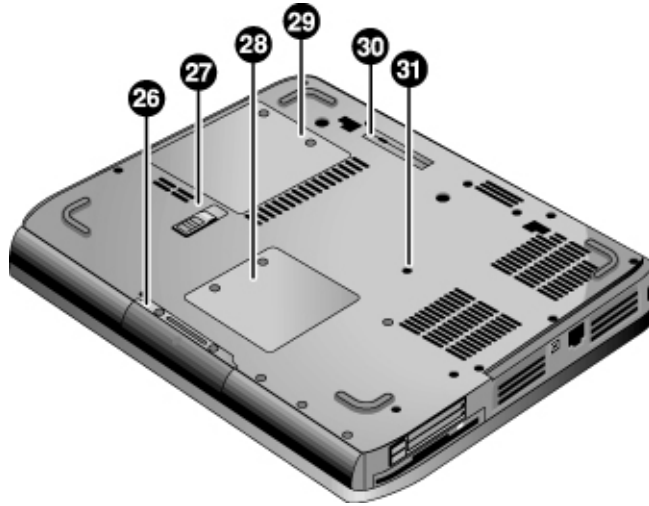
**Figure 1-1. Omnibook XE4400— Front View**

- |   |   |
|---|---|
| 1. Notebook open/close latch.   | 8. Wireless on-off button and indicator light*.                               |
| 2. One-touch buttons.   | 9. Battery.   |
| 3. Keyboard status lights.  | 10. Volume and mute controls*.  |
| 4. Power button. Turns the notebook on and off.                                 | 11. Audio jacks (left to right): audio out (headphones), external microphone. |
| 5. Touch pad, scroll pad, click buttons, plus on-off button.                    | 12. CD-ROM, DVD, or other drive.  |
| 6. Main status lights (left to right): power mode, battery, hard disk activity. | 13. Universal Serial Bus (USB) port.  |
| 7. Infrared port*.  | * on certain models   |



**Figure 1-2. Omnibook XE4400— Back View**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>14. AC adapter jack.</li> <li>15. Two USB ports.</li> <li>16. LAN port*.</li> <li>17. PS/2 keyboard or PS/2 mouse port (supports Y adapter).</li> <li>18. Parallel port (LPT1). Use this port for a parallel printer or other parallel device.</li> <li>19. External monitor.</li> </ul> | <ul style="list-style-type: none"> <li>20. S-video port*.</li> <li>21. Kensington lock slot (security connector).</li> <li>22. Modem port*.</li> <li>23. IEEE 1394 port*.</li> <li>24. Two PC Card and CardBus slots and buttons.</li> <li>25. Floppy drive*.</li> </ul> |
|---|--|
- \* on certain models



**Figure 1-3. Omnibook XE4400— Bottom View**

26. Hard disk drive.

27. Battery latch.

28. Mini-PCI door (no user parts inside).

29. SDRAM door.

30. Port replicator connector\*.

31. Reset button.

\* on certain models

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# Operation

This section gives an overview of the notebook's operation.

## Turning the Notebook On and Off

You can start and stop your notebook using its power button. However, at certain times you might want to use other methods to start or stop the notebook—depending on power considerations, types of active connections, and start-up time.

**Note**

This manual describes the notebook in its original factory configuration, with all settings at their default values.







**Table 1-2. Activating Power Modes**

Power mode	To enter this mode
<b>On</b> Power mode status light is on.	Press the power button.
<b>Standby mode</b> Saves significant power. Turns off the display and other components. Maintains current session in RAM. Restarts quickly. Restores network connections. Power mode status light blinks.	Press the power button –or– click Start, Turn Off Computer, Stand By (Windows XP) –or– click Start, Shut Down, Standby (Windows 2000) –or– allow timeout.
<b>Hibernate mode</b> Saves maximum power. Saves current session to disk, then shuts down. Restores network connections. Power mode status light is off.	Press Fn+F12 –or– click Start, Shut Down, Hibernate (Windows 2000) –or– allow timeout.
<b>Shut down (off)</b> Saves maximum power. Turns off without saving current session. At startup, resets everything, starts a new session, and restores network connections. Power mode status light is off.	Click Start, Turn Off Computer, Turn Off (Windows XP) –or– click Start, Shut Down, Shut down (Windows 2000) –or– press the power button for 4 seconds (only if the Start menu procedure doesn't work).
<b>To turn on:</b> Press the power button to restart, or to resume your session from Standby or Hibernate mode.	

## Checking the Status of the Notebook






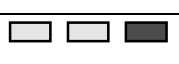
The main status lights on the front of the notebook report power status, battery status, and hard disk activity.

**Table 1-3. Main Status Lights (front of notebook)**

  	Meaning
	<b>Power status</b> On: notebook is on (even if the display is off). Blinking: notebook is in Standby mode. Off: notebook is off or in Hibernation mode.
	<b>Hard disk drive activity</b> On: notebook is accessing the hard disk drive.
	<b>Battery status</b> Green: The AC adapter is connected and the battery is fully charged. Amber: The AC adapter is connected and the battery is charging. Blinking: The AC adapter is connected and the battery is missing or has a fault. Off: The AC adapter is not connected.

The keyboard status lights, located above the keyboard, indicate the states of the keyboard locks.

**Table 1-4. Keyboard Status Lights**

  	Meaning
	<b>Caps Lock</b> Caps Lock is active.
	<b>Num Lock</b> Num Lock is active. (The Keypad Lock must also be on to use the embedded keypad.)
	<b>Keypad Lock</b> The embedded keypad is active (Fn+F8). Num Lock must also be on for the numeric keys; otherwise, cursor control is active (as marked on an external keyboard).

## Using Fn Hot Keys

The combination of the Fn key plus another key creates a *hot key*—a shortcut key sequence—for various system controls. To use a hot key, press *and hold* Fn, press the appropriate second key, then release both keys.

**Table 1-5. Fn Hot Keys**

<b>Hot Key</b>	<b>Effect</b>
Fn+F1	Decreases the display brightness.
Fn+F2	Increases the display brightness.
Fn+F5	Toggles among the built-in display, an external display, and simultaneous display on both.
Fn+F8	Toggles the built-in keypad on and off. Does not affect an external keyboard. If Num Lock is on, then the numeric functions are active; otherwise, cursor control is active (as marked on an external keyboard).
Fn+F12	Enters Hibernate mode.
Fn+NumLock	Toggles Scroll Lock on and off.
Fn+Page Up	Increases the audio volume and cancels the mute setting.
Fn+Page Down	Decreases the audio volume.
Fn+Backspace	Audio mute.

## Resetting the Notebook

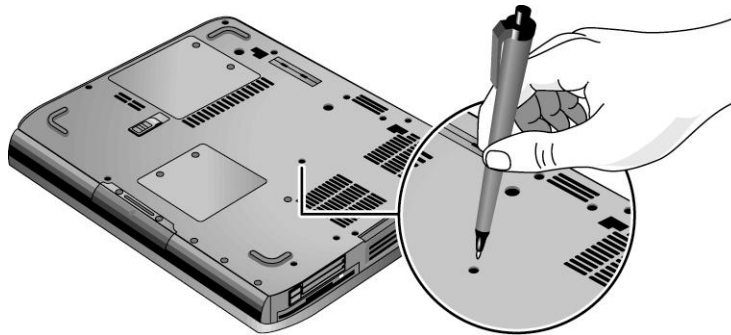
Occasionally, Windows or the notebook might stop responding, so that you cannot turn the notebook off. If this happens, try the following in the order listed. Press the power button to restart.

- If possible, shut down Windows:

**Windows XP:** press CTRL+ALT+DEL, and then click Shut Down, Restart.

**Windows 2000:** press CTRL+ALT+DEL, click Shut Down, and press the power button to restart.

- Press and hold the power button for about four seconds until the display shuts down, and then press the power button again to restart.
- Use a ballpoint pen or a straightened paper clip to press the reset button on the bottom of the notebook.



**Figure 1-4. Resetting the Notebook**

### Note

To boot from a CD, insert a bootable CD (such as the *Recovery CDs*) into the CD/DVD drive, then restart. Press Esc when the HP logo appears, then select the CD/DVD drive as the temporary boot device.



# Specifications

The following tables list the specifications for the notebook and its accessories. These are subject to change: for the latest versions, see the HP Notebook web site ([www.hp.com/notebooks](http://www.hp.com/notebooks)).

**Table 1-6. Omnibook XE4400 Specifications**

<b>Physical Attributes</b>	<p>Size (14-inch display): 329 × 272 × 44 mm (rear: 48 mm) (13 × 10.7 × 1.8 in; rear: 1.9 in).</p> <p>Size (15-inch display): 329 × 272 × 45 mm (rear: 49 mm) (13 × 10.7 × 1.8 in; rear: 1.9 in).</p> <p>Weight: 2.9 kg (6.5 lb) minimum, depending on configuration.</p>
<b>Processor and Bus Architecture</b>	<p>1.8- to 2.0-GHz Intel Pentium 4 processor (SFF or desktop). 512-KB L2 cache. 1.2- to 1.3-V core low-power processor with 400-MHz processor system bus.</p>
<b>Video</b>	<p>14.1-inch XGA (1024 × 768), or 15.0-inch XGA (1024 × 768) or SXGA+ (1400 × 1050) active-matrix (TFT) LCD display. Hardware 3D acceleration, hardware DVD acceleration.</p> <p>External monitors up to 1600 × 1200 resolution, 16M colors, and at least 85 Hz refresh rate (only 60 Hz at 1400 × 1050). Refresh rate and clarity may vary depending on monitor, resolution, and color depth. ATI Mobility Radeon graphics accelerator with 32-MB DDR graphics memory, 4x AGP graphics capability. Dual display capability (depends on operating system support).</p>
<b>Power</b>	<p>Rechargeable lithium-ion (14.8 Vdc) or nickel-metal-hydride (9.6 Vdc) battery with LED charge-level gauge. Battery life: up to 3 (Lilon) or 2 hours (NiMH) hours typical (varies with model, usage, and power settings). Fast battery recharge: 2.5 hours when system is off, 4 hours when system is on. Low-battery warning. Suspend/resume capability.</p> <p>Universal AC adapter: 100–240 Vac (50/60 Hz) input, 19 Vdc output, 90 W.</p>
<b>Mass Storage</b>	<p>20- to 60-GB removable hard drive with Ultra-DMA 100 interface. 1.44-MB floppy drive (certain models). 24x CD-ROM, or 8x DVD, or CD-RW, or CD-RW/DVD drive (or higher).</p>
<b>RAM</b>	<p>At least 128 MB SDRAM preinstalled.</p> <p>Two slots for PC2100 DDR-266 SDRAM modules. Up to 2 GB (2048 MB) SDRAM using 1 GB modules (when available); otherwise, up to 1 GB (1024 MB) SDRAM using 512 MB modules.</p>
<b>Audio System</b>	<p>Stereo sound via two built-in speakers. 3D-enhanced audio. Volume and mute buttons (certain models). Built-in microphone (certain models). Headphone-out and microphone-in.</p>
<b>Keyboard and Pointing Device</b>	<p>87/88-key touch-type QWERTY keyboard with 101/102 key emulation. Embedded numeric keypad. 12 function (Fn) keys. 5 user-programmable One-Touch buttons. Touch pad with integrated scroll pad, on-off button and indicator. Left and right click buttons.</p>
<b>LAN</b> (certain models)	<p>Ethernet 10Base-T (10 Mbps) and 100Base-TX (100 Mbps) support. Supports wake-on-LAN, fast IP, DMI, dRMON. MBA (Managed Boot Agent) support for PXE/BINL, NCP/IPX, DHCP.</p>

<b>Modem</b> (certain models)	<p>Software-based modem.</p> <p>Data speed: 56 Kbps (V.92) maximum.</p> <p>Fax speed: 14.4 Kbps, Class 1 and 2.</p> <p>Modulation: V.21, V.22, V.22bis, V.23, V.32, V.32bis, V.34, V.90, V.92, X2, Bell 103, Bell 212A.</p> <p>Synchronous transfer: V.80.</p> <p>Compression: V.42bis, MNP5.</p> <p>Error correction: V.42, MNP2-4.</p> <p>Fax: Group 3 fax, Class 1. V.17, V.27ter, V.29, V.21.</p>
<b>Wireless LAN</b> (certain models)	<p>Radio: IEEE 802.11b, WECA Wi-Fi compliant, direct-sequence spread-spectrum.</p> <p>Operating frequency: 2.5-GHz ISM band, exact frequencies and channels depend on country.</p> <p>Raw data rate: 1, 2, 5.5, or 11 Mbps.</p> <p>Transmitter output: 15 dBm typical (approx. 30 mW), 16 dBm max (approx. 40 mW).</p> <p>Receiver sensitivity: -84 dBm typical.</p> <p>Range: up to 100 m (300 ft) or more, depending on environment and conditions.</p> <p>On-off button and indicator.</p> <p>Mini-PCI interface.</p>
<b>Input/Output</b>	<p>25-pin bi-directional ECP/EPP parallel.</p> <p>15-pin VGA video-out with DDC support.</p> <p>S-video TV out (certain models).</p> <p>PS/2 keyboard/mouse.</p> <p>4-Mbps IrDA-compliant infrared port (certain models).</p> <p>IEEE-1394 (certain models).</p> <p>Universal serial bus (USB 1.1), three ports.</p>
<b>Expandability</b>	<p>One or two 16-/32-bit PC Card slots, Type II or III, CardBus enabled.</p> <p>Optional port replicator (certain models).</p>
<b>Security Features</b>	<p>User and administrator passwords.</p> <p>System password.</p> <p>PC identification displayed at boot.</p> <p>WMI-accessible electronic serial number.</p> <p>Kensington MicroSaver lock slot.</p>
<b>Environmental Limits</b>	<p>Operating temperature: 5 to 35 °C (41 to 95 °F).</p> <p>Operating humidity: 20 to 90 percent RH (5 to 35 °C).</p> <p>Operating altitude: up to 3000 m (10,000 ft) at 25 °C (77 °F).</p> <p>Storage temperature: -20 to 50 °C (-4 to 122 °F).</p>
<b>Major ICs</b>	<p>CPU: Intel Pentium 4 processor (SFF or desktop).</p> <p>Core logic: ALI 1671 / 1535+ chipset.</p> <p>Display controller: ATI Mobility Radeon M6-C/P.</p> <p>Audio/Modem controller: Conexant Smart AMC CX20468-21.</p> <p>CardBus controller: TI PC1520.</p> <p>Keyboard/embedded controller: National PC87570.</p> <p>Super I/O: integrated in core logic.</p> <p>IEEE 1394: TI TSB43AB22.</p> <p>LAN: National NS83815.</p> <p>802.11b wireless LAN: Ambit with Intersil Prism 2.5 chipset.</p>

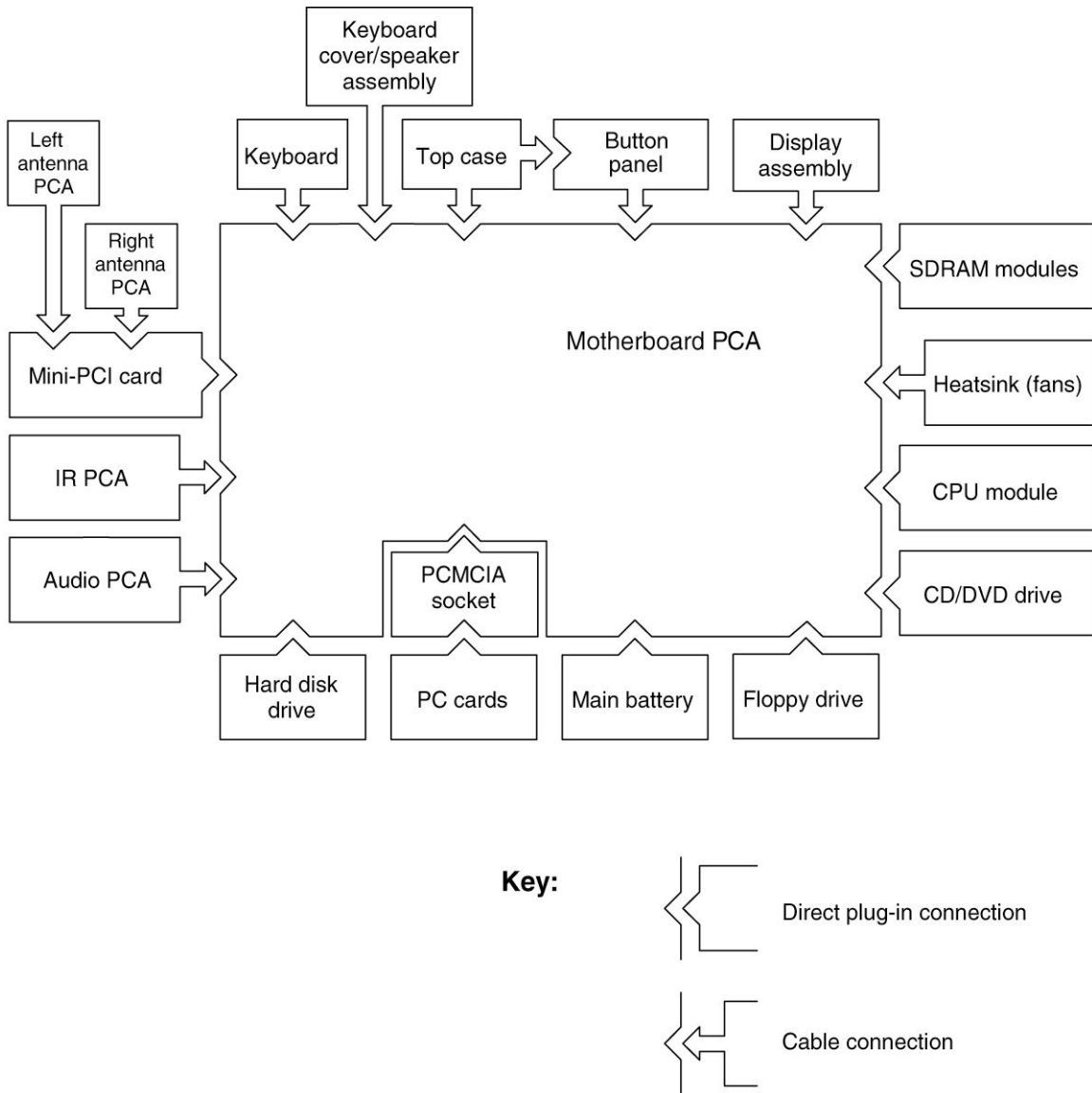
**Table 1-7. Omnibook XE4400 Accessories**

<b>Accessory</b>	<b>Description</b>
<b>Memory</b>	
F4694A	128-MB SDRAM module (DDR266)
F4695A	256-MB SDRAM module (DDR266)
F4696A	512-MB SDRAM module (DDR266)
<b>Hard Drive</b>	
F4810A	40-GB hard disk drive module
<b>Power Options</b>	
F4813A/ F5104A	90-watt AC adapter
F4809A/ F4812A	8-cell Lithium-ion battery
8120-6312	Replacement power cord (Australia)
8120-6313	Replacement power cord (U.S., Canada, Taiwan)
8120-6314	Replacement power cord (Europe)
8120-6316	Replacement power cord (Japan)
8121-0702	Replacement power cord (India)
8120-6317	Replacement power cord (South Africa)
8120-8367	Replacement power cord (Argentina)
8120-8373	Replacement power cord (People's Rep. of China)
8120-8441	Replacement power cord (S. Korea)
8120-8452	Replacement power cord (Chile)
8120-8699	Replacement power cord (Hong Kong, Singapore)
<b>Adapters</b>	
F1469A	PS/2 Y adapter
<b>PC Cards</b>	
F2136B	802.11b wireless comm PC card (128-bit)
F2196A	3Com bluetooth PC card
<b>Docking</b>	
F4808A/ F4811A	Simple port replicator
<b>Other</b>	
F2100A	USB optical travel mouse
P1534A	External amplified speakers
P1977A	USE compact flash reader (Type II)
F1645A	Kensington lock
P1978B	USB web camera

# Internal Design

The motherboard PCA is the central component of the notebook's design. It plays a role in virtually all system functions. The CPU module and most other subsystems connect to the motherboard.

The following figure shows the connections among the notebook's replaceable electronic modules. Table 1-8 on page 1-13 lists the roles that these modules play in the notebook's functional subsystems.



**Figure 1-5. Replaceable Module Diagram**

**Table 1-8. Functional Structure Description**

<b>Bootup</b>	CPU module Motherboard Hard disk drive Floppy drive	Main processor (MMO). Primary system circuitry, system BIOS. First source of disk-based startup code. Second source of disk-based startup code.
<b>Processor</b>	CPU module Motherboard	Main processor, numeric data processor, L1 and L2 cache. Primary system circuitry.
<b>Memory</b>	Motherboard SDRAM module	Video RAM no onboard SDRAM
<b>Power</b>	Battery Motherboard  AC adapter	Power storage. AC adapter socket, reset button, lid switch, power supply, power control circuitry. AC-to-DC converter.
<b>Display</b>	Motherboard Display assembly	Graphics controller, video RAM Display output, backlight, power converter for backlight.
<b>Hard disk</b>	Motherboard Hard disk drive	Hard disk controller. Hard disk mechanism.
<b>Floppy drive</b>	Motherboard Floppy drive	I/O controller, floppy connector. Floppy drive mechanism.
<b>Keyboard</b>	Motherboard Button cover Keyboard	Keyboard BIOS, keyboard controller. Power switch, one-touch buttons Key switches.
<b>PS/2 Touchpad</b>	Motherboard Top case	Keyboard circuitry, keyboard controller, keyboard BIOS. Touch pad sensor, click buttons, controller (PS/2 output).
<b>Audio</b>	Motherboard Audio Control PCA Keyboard cover/speaker assembly	Audio controller, audio decoder, speaker amplifier, microphone. External audio jacks, headphone amplifier, audio-off switch. Speakers.
<b>Status</b>	Motherboard Button cover Top case	LED circuitry, keyboard controller. Keyboard LEDs. Main status LEDs.
<b>Serial</b>	Motherboard	I/O controller, serial connector.
<b>Parallel</b>	Motherboard	I/O controller, parallel connector.
<b>Infrared</b>	Motherboard	I/O controller, infrared transmitter/receiver.
<b>PS/2 port</b>	Motherboard	PS/2 connector, keyboard controller.
<b>USB</b>	Motherboard	Bus controller (South Bridge), USB connector.
<b>S-Video</b>	Motherboard	I/O controller, S-video connector (certain models).
<b>Port Replicator</b>	Motherboard	Port replicator logic, port replicator connector (certain models).
<b>PCMCIA</b>	Motherboard PCMCIA socket	PCMCIA controller. PCMCIA connectors.
<b>Wireless LAN</b> (certain models)	Mini-PCI Antenna PCAs	I/O controller, radio, radio frequency circuitry. Transmit/receive antennas.
<b>LAN</b>	Motherboard	LAN circuitry, bus controller, LAN connector.
<b>Modem</b>	Motherboard	Modem circuitry (certain models), modem connector.



## Removal and Replacement

This chapter tells you how to remove and replace the notebook's components and assemblies. The items marked by • in the following table are user-replaceable.

**Table 2-1. Removal Cross-Reference**

<ul style="list-style-type: none"> <li>Assembly, display (page 2-18).</li> <li>Battery, CMOS (page 2-41).</li> <li>• Battery, main (page 2-4).</li> <li>• Card, wireless LAN mini-PCI (page 2-7).</li> <li>Case, bottom (page 2-34).</li> <li>Case, top (page 2-20).</li> <li>• Cover, keyboard/speaker assembly (page 2-11).</li> <li>• Door, mini-PCI (page 2-10).</li> <li>• Door, memory (page 2-10).</li> <li>Doors, PCMCIA (page 2-37).</li> <li>• Drive, hard disk (page 2-8).</li> <li>• Drive, CD/DVD (page 2-17).</li> <li>Drive, floppy (page 2-18).</li> </ul>	<ul style="list-style-type: none"> <li>• Feet, rubber (page 2-10).</li> <li>Heatsink (with fans) (page 2-31).</li> <li>Keyboard (page 2-13).</li> <li>Module, CPU (page 2-33).</li> <li>• Module, SDRAM (page 2-5).</li> <li>• Panel, cover (page 2-15).</li> <li>PCA, audio control (page 2-26).</li> <li>PCA, front antennas (page 2-37).</li> <li>PCA, IR (page 2-24).</li> <li>PCA, motherboard (page 2-34).</li> <li>• Rubber screw plug, HDD (page 2-10).</li> <li>Shield, ESD (page 2-29).</li> <li>Socket, PCMCIA (page 2-28).</li> </ul>
--	---


### Caution

Always provide proper grounding when performing repairs. Without proper grounding, an electrostatic discharge can damage the notebook and its components.



### Notes

Reassembly steps are the reverse of the removal steps. Reassembly notes are included at the end of each section below.

 Symbols like these are displayed throughout this chapter to show approximate full-size screw outlines. You can use these to verify the sizes of screws before you install them. Installing a wrong-size screw can damage the notebook. (The symbol at the left represents an M2.5 x 5 mm T-head screw.)

**Table 2-2. Required Equipment**

- Small Phillips screwdriver, preferably magnetized.
- Small flat-blade screwdriver.
- 5 mm nut driver

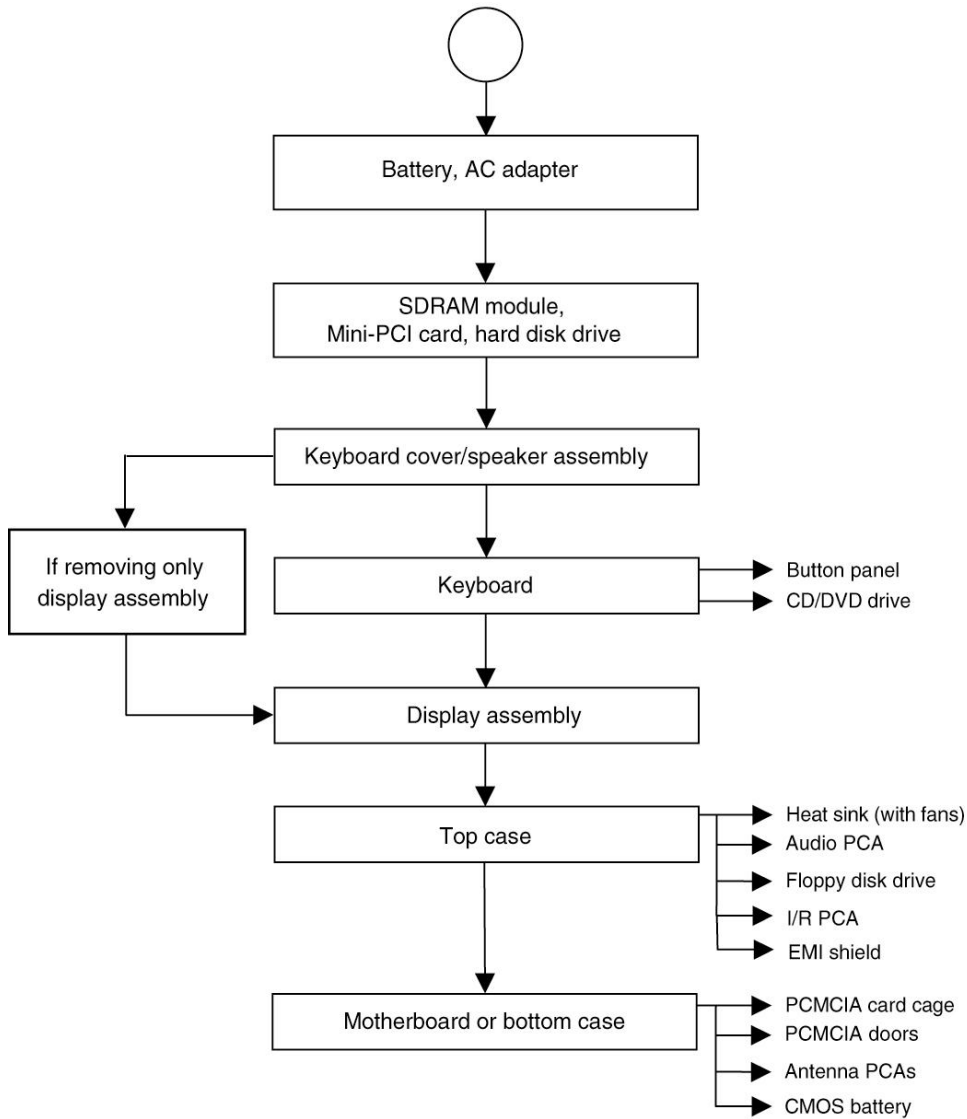
**Table 2-3. Recommended Screw Torque Values**

<b>Screw Thread Size</b>	<b>Torque (cm-kgf)</b>	<b>Torque (in-lbf)</b>
M2	2,0 – 2,5	1.7 – 2.2
M2.5 (hinges)	3,5 – 4,0	3.0 – 3.4
M2.5 (other)	2,5 – 3,0	2.2 – 2.6
M3	2,5 – 3,0	2.2 – 2.6
Standoff, hex	2,5 – 3,0	2.2 – 2.6



# Disassembly Flowchart

The following diagram shows the general “path” you will use when disassembling the notebook to access any particular component.



**Figure 2-1. Disassembly Flow**

---

## Removing the Battery

(User-Replaceable)

### Required Equipment

- None.

### Removal Procedure

- Slide the battery's release latch, then pull the battery out of its compartment.

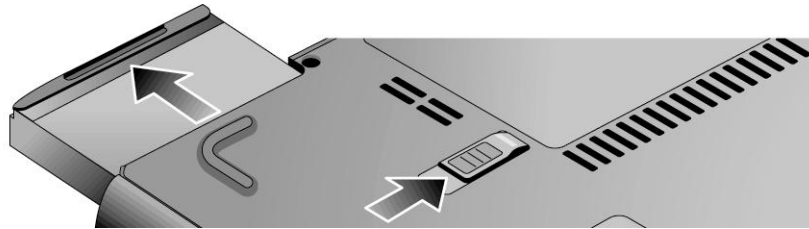


Figure 2-2. Removing the Battery

---

## Removing a SDRAM Module

### (User-Replaceable)

The notebook has no system memory built into its motherboard, but has two slots for SDRAM modules. One slot contains an SDRAM module that was factory installed.

**Note**

Omnibook XE4400 models use only DDR266 SDRAM modules. Using the wrong type of module prevents the notebook from booting.

**Caution**

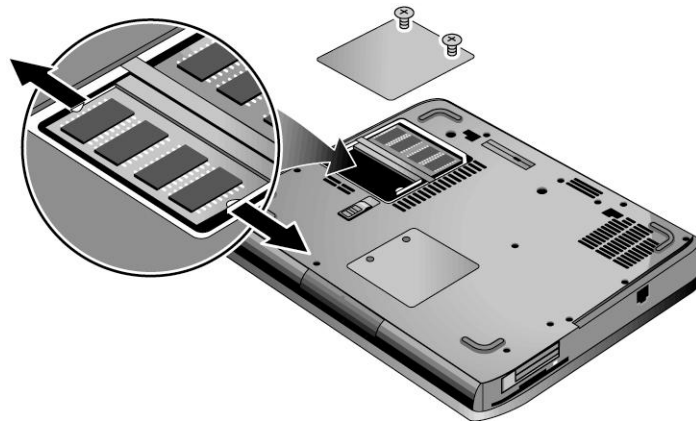
Handle the SDRAM module only by its edges and provide proper grounding, or you might damage the module through electrostatic discharge.

**Required Equipment**

- Small Phillips screwdriver.

**Removal Procedure**

1. Unplug the AC adapter, if present, and then remove the battery.
2. On the bottom of the notebook, loosen the captive screws holding the memory door, and then remove the door.
3. Press outward on the latches at the sides of the SDRAM module to release it (the SDRAM module pops up).
4. Carefully pull the SDRAM module out of the connector.



**Figure 2-3. Removing an SDRAM Module**

**Reassembly Notes**

- Carefully press the SDRAM module into the connector at an angle of about 30°, until it is fully inserted. Then press down on both sides of the SDRAM module until the latches snap closed.

---

## Removing the Wireless LAN Mini-PCI Card (User-Replaceable)

Certain notebooks include a wireless LAN mini-PCI card under the mini-PCI door on the bottom of the notebook.

### Caution

Handle the Mini-PCI card only by its edges and provide proper grounding, or you might damage the card through electrostatic discharge.

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and then remove the battery.
2. On the bottom of the notebook, loosen the captive screws holding the Mini-PCI door, and then remove the door.

### Caution

Be careful when connecting and disconnecting the antenna cables from the mini-PCI card. Damaged cables or connectors can degrade notebook performance.

3. Disconnect the two antenna cables from the mini-PCI card.
4. Press outward on the latches at the sides of the mini-PCI card to release it (the mini-PCI card pops up).
5. Carefully pull the mini-PCI card out of the connector.

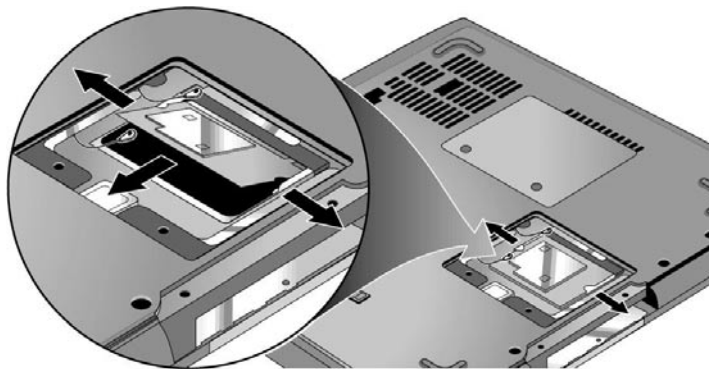


Figure 2-4. Removing the Mini-PCI Card

### Reassembly Notes

- Carefully press the mini-PCI card into the connector at an angle of about 30°, until it is fully inserted. Then press down on both sides of the mini-PCI card until the latches snap closed.

---

# Removing the Hard Disk Drive

(User-Replaceable)

## Required Equipment

- Small Phillips screwdriver.

## Removal Procedure

### Important

If you are installing a new hard disk drive, load the factory software and operating system on the drive as described in "Recovering the Factory Software," as shown on the next page.

1. Unplug the AC adapter, if present, and then remove the battery.
2. On the bottom of the notebook, remove the hard drive rubber screw plug and retaining screws.
3. Carefully pull the hard drive out of the notebook.

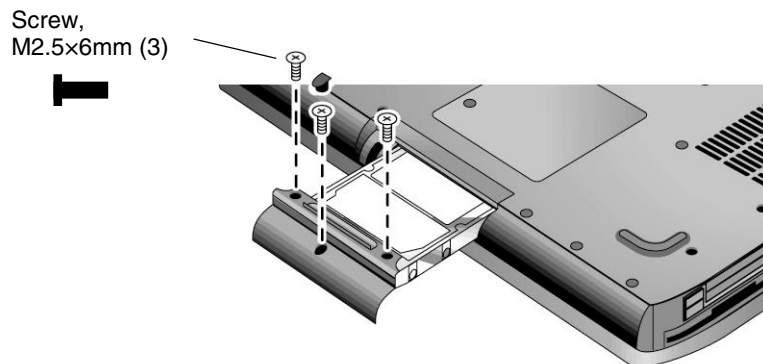
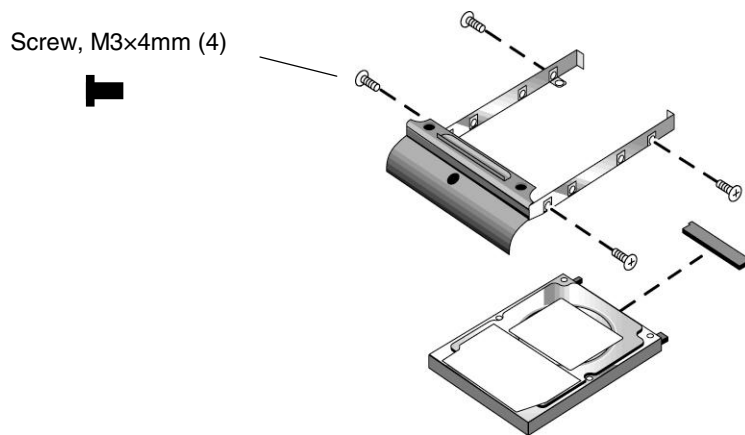


Figure 2-5. Removing the Hard Disk Drive

4. Remove the screws from the drive and drive tray, then lift the drive out of the tray.
5. Remove the connector from the hard disk drive.



**Figure 2-6. Removing the Hard Disk Drive Tray**

## Recovering the Factory Software

The following procedure describes how to recover the notebook's original software and operating system. This process can take up to 15 minutes to complete. (For more information about recovering the factory software installation, see the readme.txt file in the root directory of the *Recovery CDs*.)

### **Caution**

Do not interrupt the following process or unplug the AC adapter until the process completes.

1. Connect the AC adapter to the notebook.
2. Insert *Recovery CD* disk 1 into the notebook's CD/DVD drive. If the notebook is turned off, use a pin or straightened paper clip to press the release switch on the drive door to open it.
3. Turn on or restart the notebook.
4. When the HP logo appears, press Esc to display the Boot menu.
5. Use the arrow keys to select the CD/DVD drive as the first boot device, then press Enter.
6. When the *Recovery CD* dialog box appears, follow the displayed instructions. If prompted, accept the recommended partition size.

To create the Utility partition without installing the factory software, click Advanced and select not to install the operating system.

If the hard disk is partitioned into several logical drives, you can install the factory software on drive C without affecting other drives. Click Advanced and select to restore only the C partition.

7. When prompted to reboot the notebook, press Ctrl+Alt+Del and follow any instructions that appear.

---

## Replacing Small Parts (User-Replaceable)

The user can replace the following small parts.

**Table 2-4. Replacing Small Parts (User-Replaceable)**

<b>Part</b>	<b>Replacement Procedure</b>
<b>Rubber screw plug (on hard disk drive tray)</b>	Insert a small flat-blade screwdriver under the rubber screw plug and pry it loose. To replace, firmly press the adhesive side of the screw plug into the recess.
<b>Door, mini-PCI</b>	On the bottom of the notebook, loosen the screws that secure the mini-PCI door to the bottom case and then remove the door.
<b>Door, memory</b>	On the bottom of the notebook, loosen the screws that secure the SDRAM module door to the bottom case and then remove the door.
<b>Feet, rubber (on bottom of notebook)</b>	Insert a small flat-blade screwdriver under the foot and pry it loose. To replace, firmly press the adhesive side of the foot into the recess.
<b>Rubber cover, docking port</b>	Grasp the rubber docking port cover with your fingers and gently remove it. To replace, firmly press the docking port cover into the opening in the bottom case.
<b>Cover, modem port</b>	Insert a small flat-blade screwdriver at the top of the cover and gently pry it loose. To replace, insert the cover into the modem port opening.



---

## Removing the Keyboard Cover/Speaker Assembly (User-Replaceable)

### Required Equipment

- Small Phillips screwdriver.
- Small flat-blade screwdriver.

### Removal Procedure

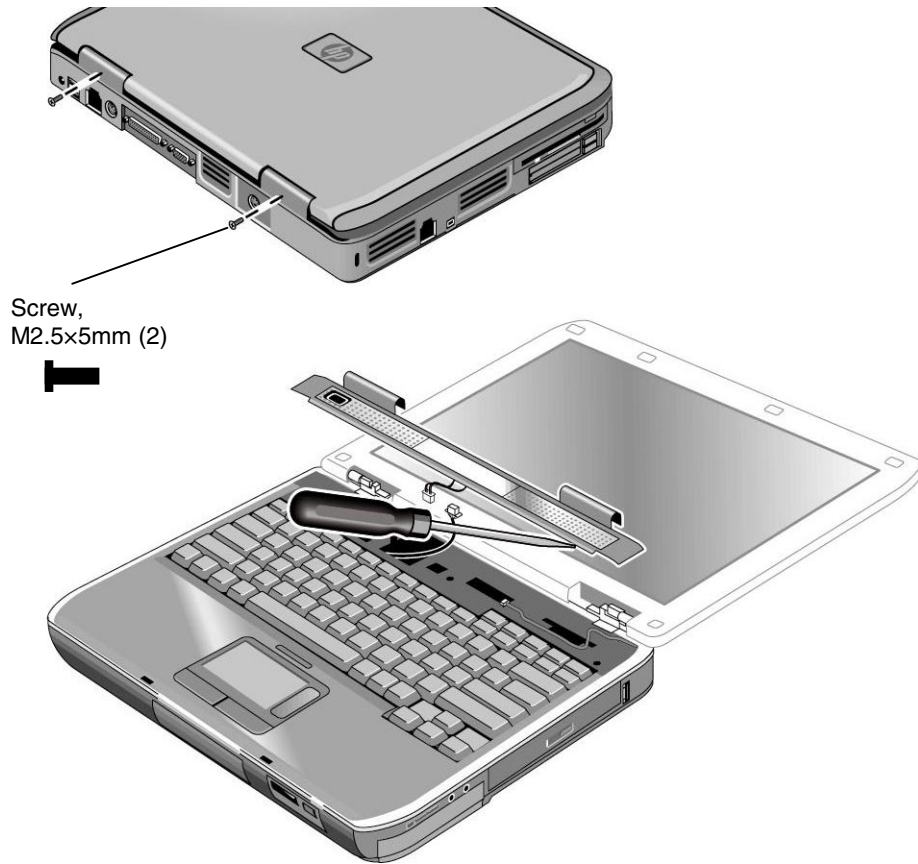
1. Unplug the AC adapter, if present, and then remove the battery.
2. Remove the two screws that secure the keyboard cover/speaker assembly to the rear of the notebook.
3. Carefully insert a flat-blade screwdriver blade under the keyboard cover/speaker assembly near the right end, and then gently pry up the center.
4. Carefully remove the keyboard cover/speaker assembly connector from the motherboard.

### Caution

Be careful not to damage the antenna PCA that is connected to the left and right display assembly hinges. Damaging either antenna PCA can degrade notebook performance.

### Reassembly Notes

- If necessary, install a new label.
- Insert the tabs of the keyboard cover/speaker assembly into the mating slots under the keyboard, and then press it into place.



**Figure 2-7. Removing the Keyboard Cover/Speaker Assembly**

---

# Removing the Keyboard

## (User-Replaceable)

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

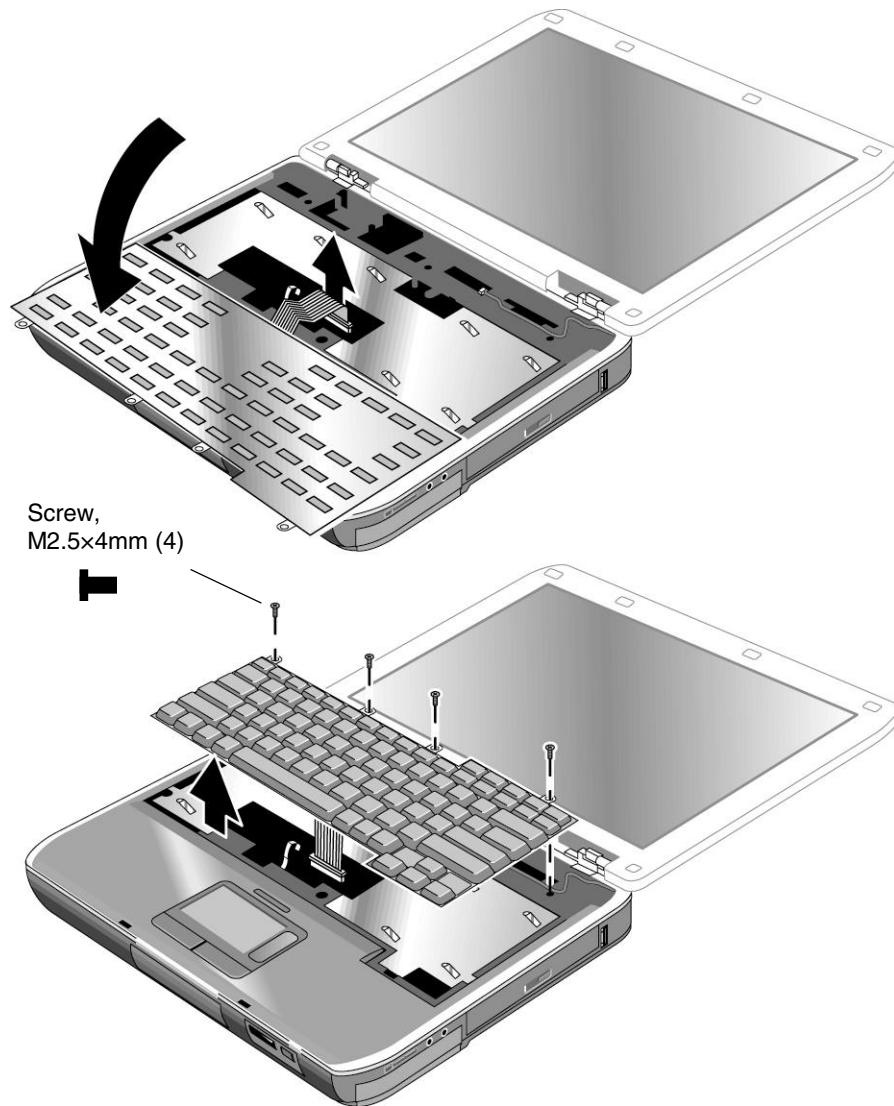
1. Unplug the AC adapter, if present, and remove the battery.
2. Remove the keyboard cover/speaker assembly (page 2-11).
3. Remove the screws that secure the keyboard to the top case.
4. Lift up on the keyboard at the button cover end and then pull it toward the display assembly to release the tabs from the top case.
5. Turn the keyboard over and disconnect the motherboard cable.
6. Remove the keyboard.

### Reassembly Notes

**Caution**

Do not excessively bend or fold the keyboard cable. Excessive flexing can damage the keyboard cable connectors.

- Lay the keyboard face down on the top case, forward of its normal position, then reconnect the keyboard cable.
- Slide the metal tabs on the bottom of the keyboard into their slots in the top case, then lower the keyboard into place.



**Figure 2-8. Removing the Keyboard**

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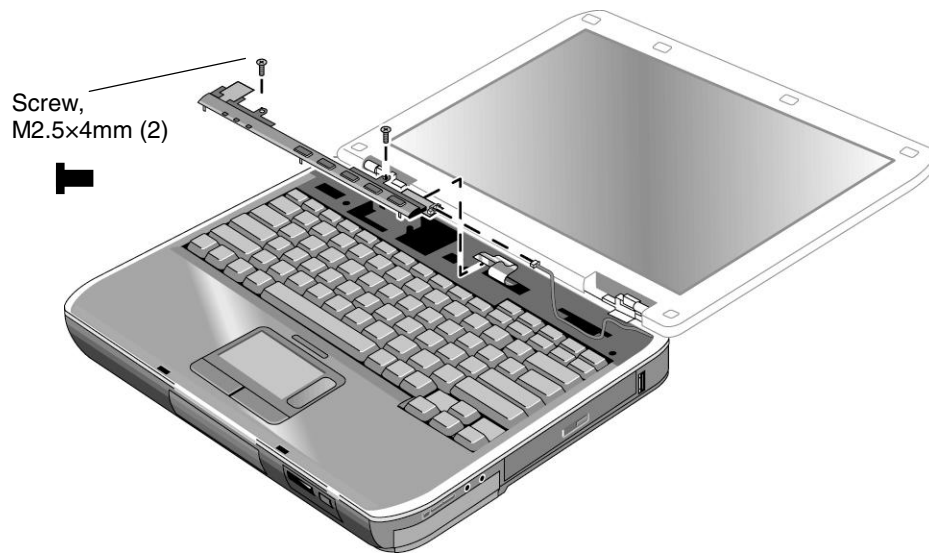
## Removing the Button Cover (User-Replaceable)

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and then remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
3. Carefully disconnect the lid switch cable from the button cover.
4. Remove the screws that secure the button cover to the top case.
5. Carefully remove the button cover from the top case, and then disconnect the underside motherboard cable.



**Figure 2-9. Removing the Button Cover**

## Reassembly Notes

**Caution**

Do not excessively bend or fold the button cover cable. Excessive flexing can damage the button cover cable connections.

- Make sure the metal contacts of the button cover cable faces the rear of the notebook.
- Connect the button cover cable to the motherboard before installing the button cover.

---

## Removing the CD/DVD Drive (User-Replaceable)

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
3. Remove the screws that secure the CD/DVD drive to the top case and motherboard.

### Caution

Be careful when inserting your index finger into the top case opening. The edges are very sharp and could cause you to injure your finger.

4. Place your index finger in the top case opening and push out on the CD/DVD drive to release it from the motherboard.
5. Remove the CD/DVD drive.

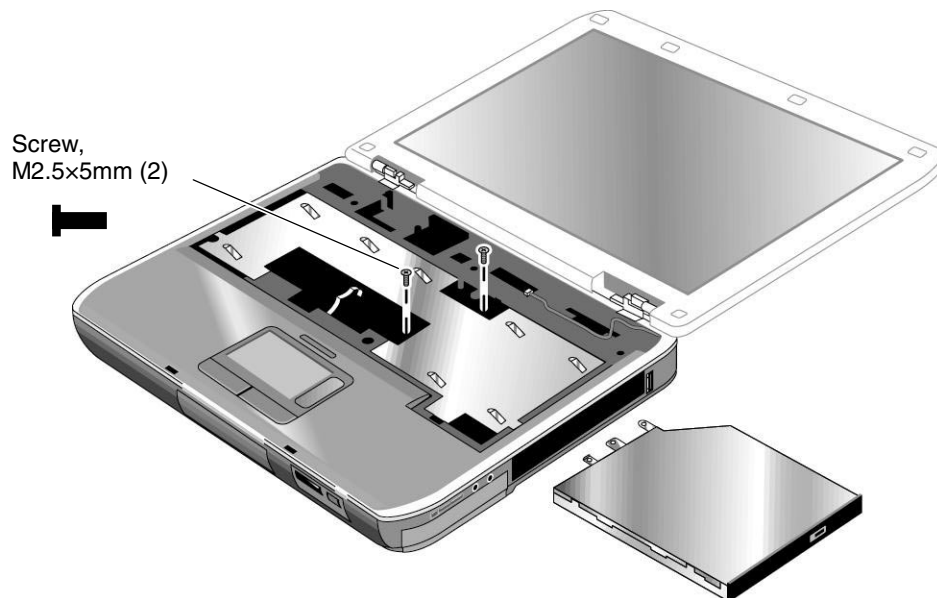


Figure 2-10. Removing the CD/DVD Drive

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# Removing the Display Assembly

## (HP Authorized Service Providers Only)

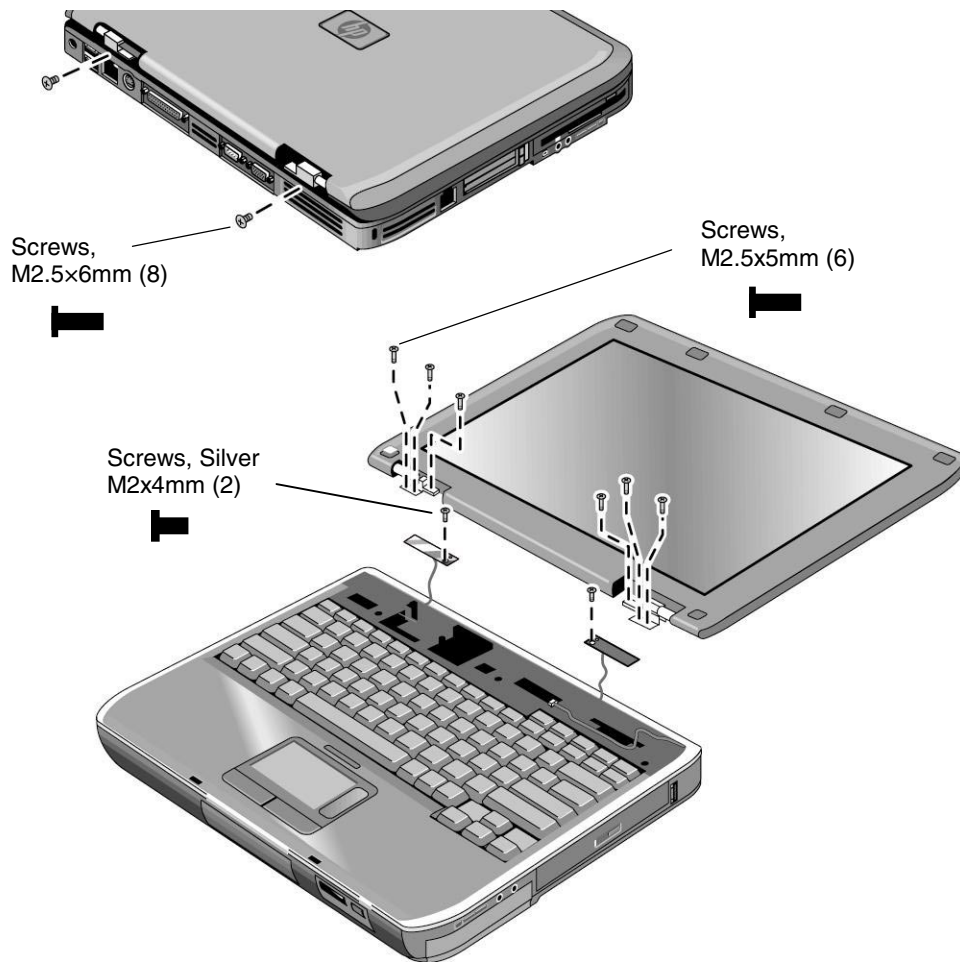
### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove the keyboard cover/speaker assembly (page 2-11).
3. Remove the screws from the rear of the notebook.
4. Remove the screws from the left and right antenna PCAs. Relocate the antenna PCAs away from the display assembly hinges.
5. Disconnect the display assembly cable from the motherboard.
6. Remove the screws that secure the display assembly to the top case. Note that there is a grounding strap at the left hinge.
7. Lift the display assembly off of the notebook.





**Figure 2-11. Removing the Display Assembly**

**Reassembly Note**

- When connecting the left and right antenna PCAs, make sure they are parallel with the display assembly hinges.

---

# Removing the Top Case

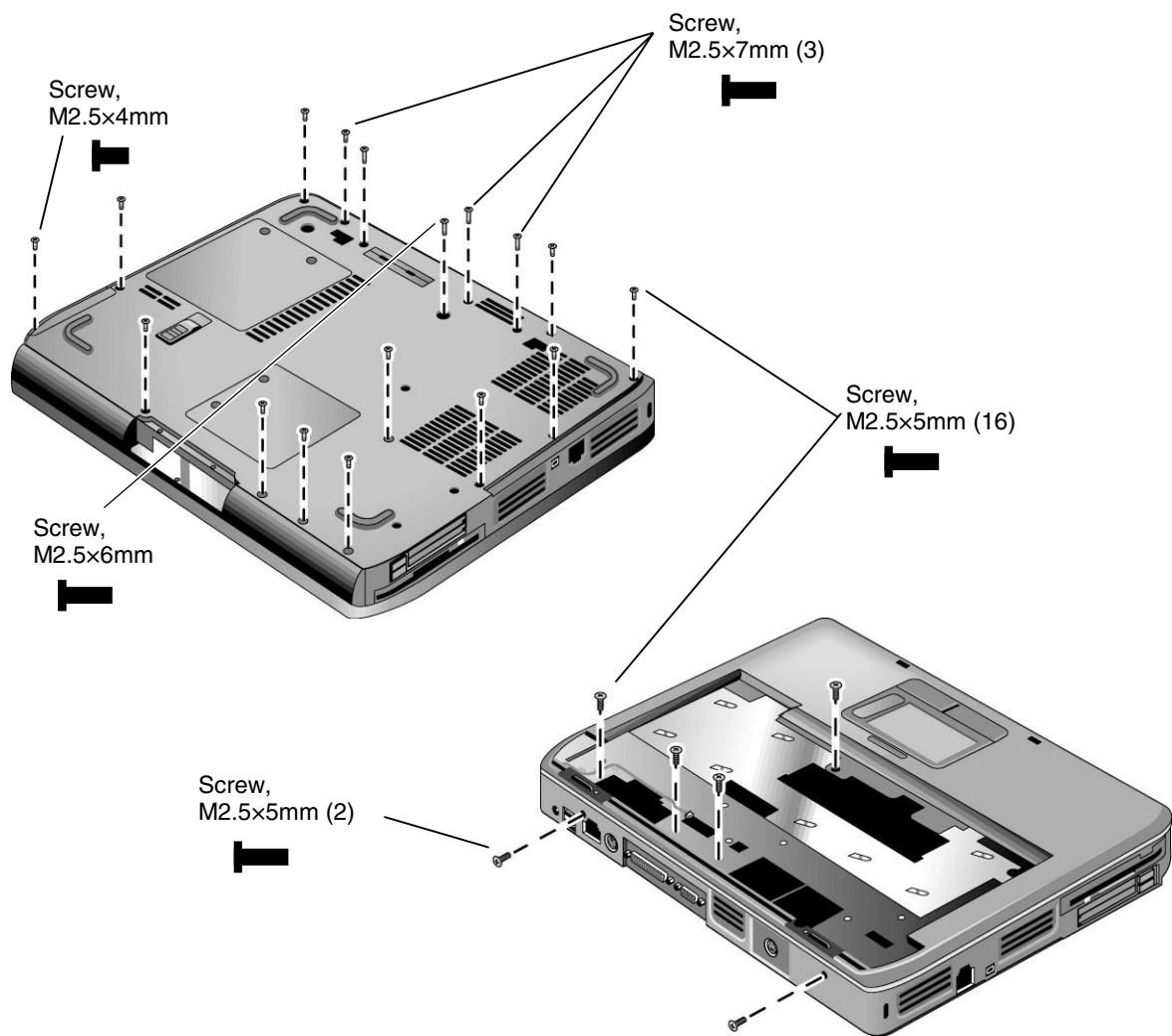
## (HP Authorized Service Providers Only)

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - CD/DVD drive (page 2-17).
  - Display assembly (page 2-18).
3. Remove the two screws from the rear of the bottom case.
4. Remove the screws from the middle and near the back of the top case.
5. Remove the screws from the bottom case.
6. At the CD/DVD drive opening, carefully unsnap the top case from the bottom case.
7. At the USB port, use your thumb to push out on the top case while lifting up on it.
8. Carefully disconnect the floppy drive and touch pad cables from the motherboard.
9. Remove the top case.



**Figure 2-12. Removing the Top Case**

**Reassembly Notes**

- When replacing the top case make sure all cables are clear of the motherboard standoffs.
- Make sure the right antenna does not come into contact with any metal surface on the top case.

---

# Removing the Floppy Drive

(HP Authorized Service Providers Only)

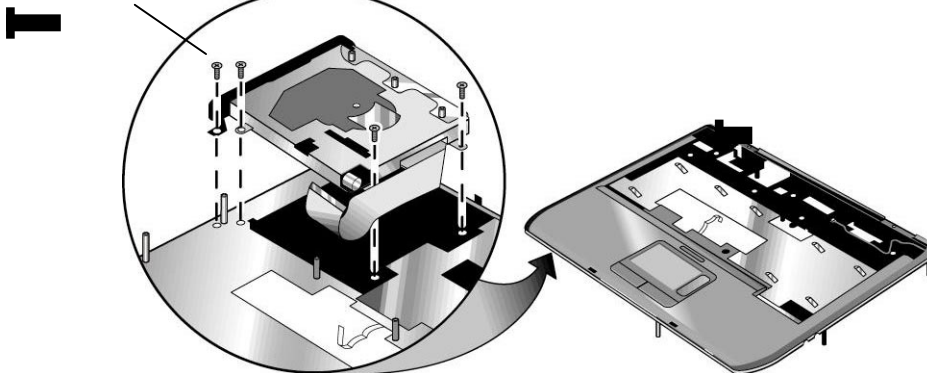
## Required Equipment

- Small Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
3. Remove the screws that secure the floppy drive to the top case.
4. Lift the floppy drive away from the top case.

Screw,  
M2.5×4mm (4)



**Figure 2-13. Removing the Floppy Drive**

## Reassembly Notes

**Caution**

Do not excessively bend or fold the floppy drive cable. Excessive flexing can damage the floppy drive cable connections.

- Connect the floppy drive cable to the motherboard with the blue tab facing the rear of the floppy drive.
- Make sure you slip the floppy drive cable under the metal tab on the top case.

---

# Removing the Infrared (I/R) PCA

(HP Authorized Service Providers Only)

## Required Equipment

- Small Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
3. Disconnect the cable from the motherboard.
4. Remove the screws that secure the I/R PCA to the bottom case.
5. Remove the I/R PCA.

## Reassembly Notes

### Caution

Use care when handling the I/R PCA cable. Damaging the cable can degrade notebook performance.

- Make sure you lift up on the battery shield and then place the I/R PCA under it.
- Make sure you route the I/R PCA cable over the battery shield as shown below.

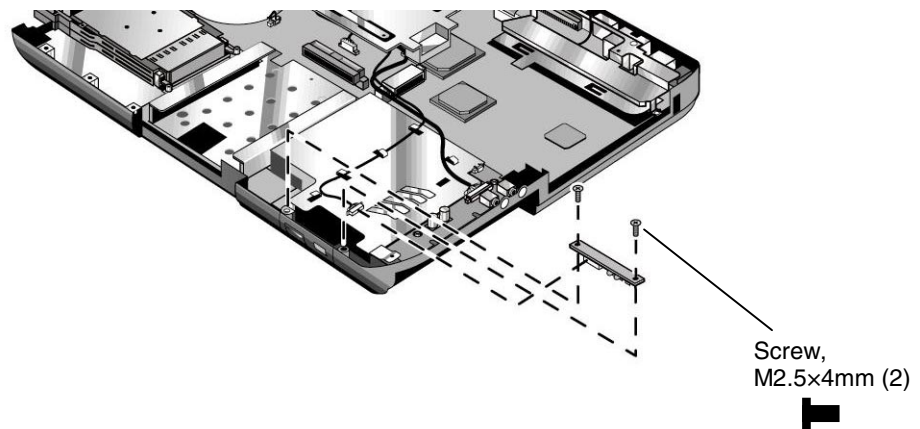


Figure 2-14. Removing the I/R PCA

---

# Removing the Audio Control PCA

(HP Authorized Service Providers Only)

## Required Equipment

- Small Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
3. Disconnect the cable from the motherboard.
4. Remove the screws that secure the audio control PCA to the bottom case.
5. Remove the audio control PCA.



## Reassembly Note

### Caution

Use care when handling the audio control PCA cable. Damaging the cable can degrade notebook performance.

- Make sure the audio control PCA cable stays clear of the CD/DVD drive rail and motherboard standoffs.

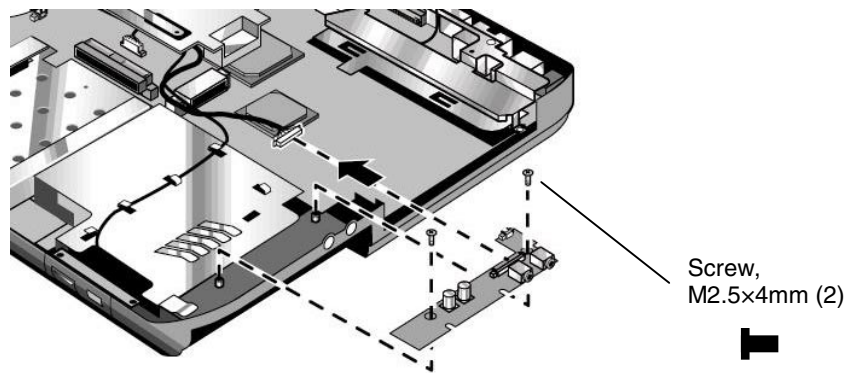


Figure 2-15. Removing the Audio Control PCA

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# Removing the PCMCIA Socket

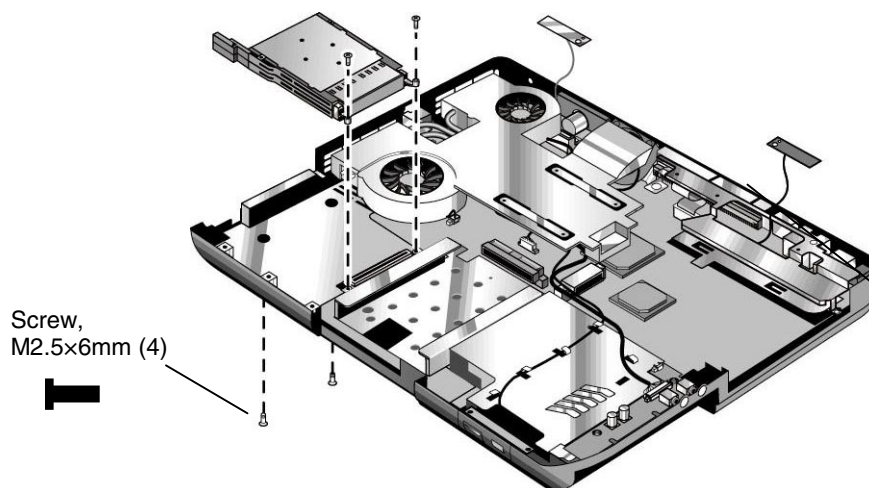
(HP Authorized Service Providers Only)

## Required Equipment

- Small Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
3. Remove the screws that secure the PCMCIA socket to the motherboard.
4. Remove the PCMCIA socket by disconnecting it from the motherboard.



**Figure 2-16. Removing the PCMCIA Socket**

---

# Removing the ESD Shield

## (HP Authorized Service Providers Only)

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
3. Remove the screws and standoffs that secure the ESD shield to the bottom case.
4. Carefully remove the ESD shield.
5. Remove the OOD guide.

## Reassembly Notes

### Caution

Use care when handling the antenna PCA cable. Damaging the cable can degrade notebook performance.

- Make sure you route the antenna PCA cable through the opening in the ESD shield.
- Replace the OOD guide first, and then make sure the notch in the ESD shield slides into the corresponding opening in the OOD guide.
- Use care when replacing the ESD shield to avoid damaging the USB port.

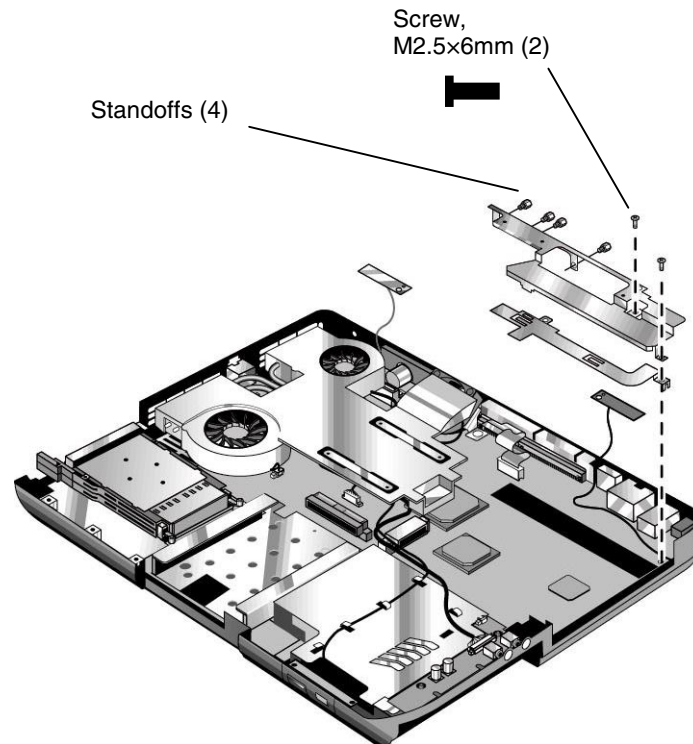


Figure 2-17. Removing the ESD Shield

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# Removing the Heatsink (with Fans)

(HP Authorized Service Providers Only)

## Required Equipment

- Small Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
3. Remove the screws that secure the heatsink (with fans) to the motherboard.
4. Lift up on the heatsink (with fans) and then disconnect the fan cables from the motherboard.
5. Lift up on the small fan and disconnect it from the motherboard.

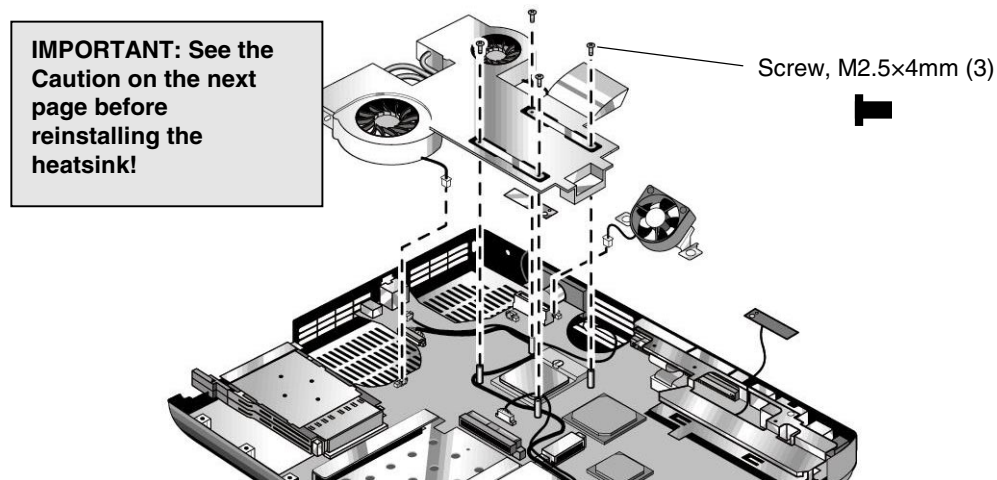


Figure 2-18. Removing the Heatsink (with Fans)

### Caution

Do not spin the fan blades with your finger, or you could damage the fan's bearings.

## Reassembly Notes

### Caution

Each time you remove the heatsink from the notebook, you must also replace the heatsink's thermal pad to maintain optimum heat transfer. Use a sharp knife or scraper to carefully remove the old thermal pad from the heatsink, then attach the new thermal pad.

- Replace the small fan first and then connect it to the motherboard. Note that the small fan gets secured to the bottom case when replacing the top case.
- Install the heatsink screws in this order:
  1. Install all four screws lightly.
  2. Fully tighten the screws in the order marked on the heatsink.

---

# Removing the CPU Module

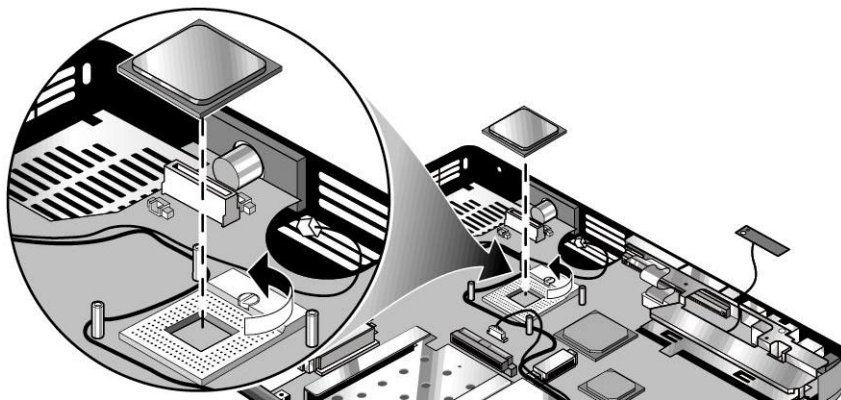
## (HP Authorized Service Providers Only)

### Required Equipment

- Small flat-blade screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
  - Heatsink (page 2-31).
3. Turn the lock screw one-half turn counterclockwise to release the CPU module (you should hear a light snap). Carefully lift the CPU module off of its socket on the motherboard.



**Figure 2-19. Removing the CPU Module**

### Reassembly Notes

- The CPU module is keyed for installation, and can be inserted only one way.
- Carefully insert the CPU module into the motherboard, and turn the lock screw one-half turn clockwise to secure the CPU module.
- Be sure to replace the thermal pad on the heatsink, as described in the reassembly notes on page 2-32.

---

# Removing the Motherboard

## (HP Authorized Service Providers Only)

### Required Equipment

- Small Phillips screwdriver.

### Removal Procedure

#### **Note: Before Replacing the Motherboard**

If possible, record the computer's electronic serial number before you replace the motherboard. You will then store the electronic serial number in the EEPROM on the new motherboard using the Service Utility floppy disk.

1. Download the service package for the Omnibook XE4400 (technology code KD) from the Partnership web site (see page vii), and create a Service Utilities floppy disk as described in the package's Readme file.
2. Plug in an AC adapter.
3. Insert the Service Utilities floppy disk in the floppy drive.
4. Turn on the notebook. When the HP logo appears (on either the built-in display or the external monitor), press Esc to display the boot menu, then choose Removable Device and boot from the floppy disk.
5. Select the Serial Number option from the boot menu.
6. When prompted, type A for the automatic update option. This stores the current system data from the old motherboard on the floppy disk.

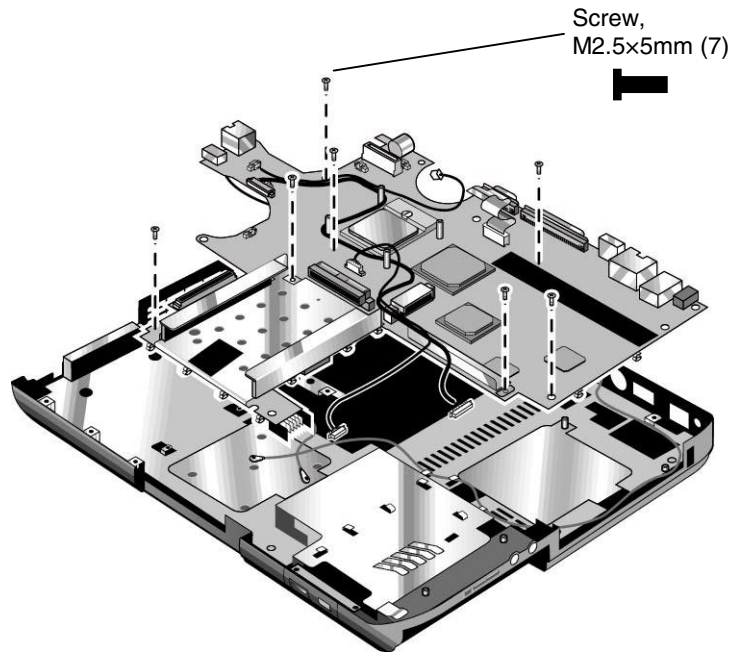
1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Hard disk drive (page 2-7).
  - Keyboard cover/speaker assembly (page 2-11).
  - Keyboard (page 2-13).
  - Button cover (page 2-15).
  - Display assembly (page 2-18).
  - Top case (page 2-20).
  - Heatsink (page 2-31).



**Caution: Wireless Models**

Be careful when removing and attaching antenna cables. Damage to cables or connectors can degrade performance.

3. **Wireless models only:** Remove the mini-PCI door and unplug the two antenna cables from the mini-PCI card. Do not remove the mini-PCI card at this time.
4. Remove the screws that secure the motherboard to the bottom case.
5. Carefully lift the motherboard out of the bottom case.
6. If present, remove the modem port cover.



**Figure 2-20. Removing the Motherboard**

**Reassembly Notes****Wireless Models Only**

- Before installing the motherboard, make sure the round coaxial cables from the antenna PCAs are held in place by the clips in the bottom case.
- Make sure there is sufficient length to the front antenna PCA cables so they can easily be connected to the mini-PCI card.

## Reassembly Procedure

### Caution

Be extremely careful when replacing the motherboard. The motherboard has EMI springs attached to it that can bend very easily. Bending any EMI spring could cause a motherboard short.

### Note: Reprogramming the BIOS IC

A new BIOS IC contains only enough basic programming to enable the notebook to boot. After installing a new motherboard, you must reprogram the BIOS IC, preferably with the latest BIOS—see page 2-38.

1. Remove the following components from the old motherboard and install onto the new motherboard:
  - CPU module
  - Wireless LAN mini-PCI card (if present)
  - SDRAM modules
2. Make sure you route the I/R PCA cable over the battery shield (page 2-24).
3. Make sure the motherboard does not cover the USB, firewire, or modem ports.
4. Follow the reassembly notes in the section entitled “Removing the Motherboard” on page 2-35.

### Note: After Replacing the Motherboard

If present, insert the modem port cover into the modem port opening. Afterwards, you must use the Service Utility floppy disk to store the system data and display information in the EEPROM on the new motherboard. To do so:

1. Plug in an AC adapter.
2. Insert the Service Utilities floppy disk in the floppy drive.
3. Turn on the notebook.
4. If you hear 5 beeps, press F1 to update the display data stored on the motherboard. Let the notebook reboot and go to the next step.
5. Select the Serial Number option from the boot menu.
6. If you successfully stored system data on the floppy disk before removing the old motherboard, type A for the automatic update. This restores the old system data on the new motherboard.

If you did not store system data, type M for the manual update option. Enter the serial number from the bottom of the notebook—you might have to contact an HP support center to do this.

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# Replacing Components on a Bottom Case

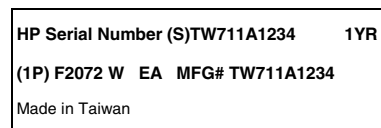
## Reassembly Procedure

1. Transfer the plastic wireless panel, and if present, the docking port cover from the old bottom case to the new bottom case.
2. Install a new Microsoft Product ID label.
3. Transfer the old serial number label and install a new overlay, or create a new serial number label using the steps below.
4. Follow the “Reassembly Notes” on page 2-35.

## Installing a New Serial Number Label

Download the latest version of the serial number label template (Microsoft Word format) from the Partnership web site (see page vii) under Support/Service in Technical Support Information. The latest version includes fields for warranty period and manufacturing location. Store the template with other Word templates on a PC connected to a laser printer.

1. Open a new document based on the serial label template.
2. Enter the information from the old serial label, and print the new label on plain white paper. The new label does not have barcodes.
3. Carefully cut out the new serial label just inside the border and place it into the inner recess in the bottom case. The bottom of the label goes toward the front of the case.
4. Make sure all regulatory labels that were on the old bottom case are also on the new bottom case.
5. While holding the paper label in place, attach a serial label overlay into the outer recess. The overlay covers and protects the serial label.



**Figure 2-21. Example of Serial Number Label**

## Replacing the Left and Right Antennas

If you need to remove or replace an antenna, see the figure below.

### Caution

Handle the connector ends of the antennas carefully. Failure to do so could degrade notebook performance.

Handle the antenna routing metal tabs in the bottom case carefully. These tabs can be easily broken.

1. Carefully remove both antennas from the old bottom case.
2. Route both antenna cables through the new bottom case as shown below. Make sure you leave enough room at the cable connector end to connect to the mini-PCI card.
3. Make sure the right antenna PCA cable does not interfere with the battery latch mechanism.

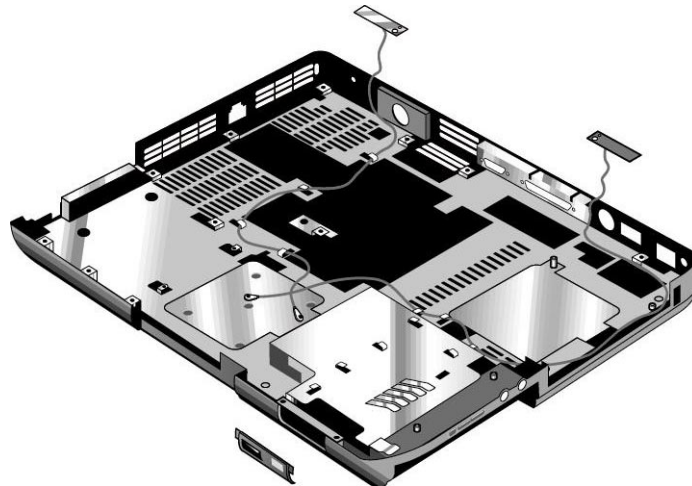


Figure 2-22. Replacing the Antennas

## Replacing a PCMCIA Door

If you need to remove or replace a PCMCIA door, see the figure below.

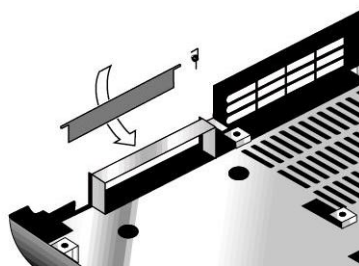


Figure 2-23. Removing a PCMCIA Door

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# Repairing the BIOS IC

## (HP Authorized Service Providers Only)

The notebook's BIOS IC cannot be replaced separately. If it is defective, you must replace the motherboard. In some cases, however, you might be able to reprogram a malfunctioning BIOS IC using either e-DiagTools for Windows, a BIOS floppy disk, or a Crisis Recovery floppy disk.

If the notebook will boot sufficiently, use e-DiagTools for Windows or a BIOS floppy disk to reprogram the BIOS IC. If you cannot boot the notebook adequately, use a Crisis Recovery floppy disk. See below for instructions for all three methods.

### Using e-DiagTools for Windows

#### Caution

The BIOS update completely replaces the previous BIOS, so follow these directions exactly or you might damage the notebook. The BIOS update also resets the configurations in the BIOS Setup utility—except for BIOS passwords—so record these before performing the update.

Update the notebook's BIOS as follows:

1. In Windows, exit any programs that are running.
2. Undock the notebook if it is docked, and remove any PCMCIA cards from it.
3. Connect the AC adapter to the notebook.
4. Connect any cables or equipment needed to connect to the Internet.
5. Click Start, Programs (or All Programs), Hewlett-Packard, Notebook, HP e-DiagTools, e-DiagTools for Windows.
6. Click Update, select Download New and click OK. Follow the instructions that appear. **Once the update process begins, do not interrupt it.**

The first time you make an Internet connection from this program on a particular unit, click Change Settings in the Connect window to define your connection settings.

7. When the process completes, press the power button to reset the notebook.

BIOS updates are available from the HP Business Support web site ([www.hp.com/go/bizsupport](http://www.hp.com/go/bizsupport)). Installation utilities and instructions for creating a BIOS floppy disk are provided with the updates.

## Using a BIOS Floppy Disk

If you do not have a BIOS floppy disk, download the package from the Partnership web site (see page vii) under Product Support Information in the Service and Support Library. Follow the instructions for creating the BIOS floppy disk.

### Caution

Make sure to use the correct BIOS floppy disk for the Omnibook model you are repairing. The program does not verify the Omnibook model, so you could accidentally install the wrong BIOS.

1. Insert the BIOS floppy disk in the floppy disk drive.
2. Turn on the notebook and allow it to boot from the BIOS floppy disk.

If the notebook does not turn on at all, do the following to boot from the BIOS floppy disk:

- a. Unplug the AC adapter.
- b. Press and hold Fn+B
- c. Plug in the AC adapter.
- d. Release Fn+B.

**Note:** If the notebook will not boot from the BIOS floppy disk, try plugging the boot-block jumper into the notebook's parallel port. See the wiring diagram below.

3. The display goes blank for a minute or more while the BIOS is reprogrammed.

**Note:** If you plugged in a boot block jumper, unplug it before the notebook automatically reboots.

4. After the BIOS reprograms itself, check the BIOS version to make sure it is the latest version. If necessary, download the latest BIOS version and reprogram the BIOS IC.

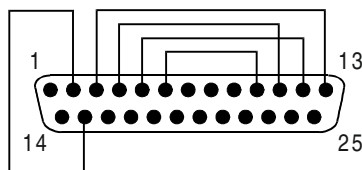


Figure 2-24. Boot-Block Jumper

# Removing Other Components

## (HP Authorized Service Providers Only)

### Required Equipment

- Small Phillips screwdriver.
- Small flat-blade screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove the assemblies and follow the additional steps listed in the table below.

**Table 2-5. Removing Omnibook XE4400 Components**

Component	Removal Procedure	Additional Steps
<b>Battery, CMOS</b>	Keyboard cover (page 2-11). Keyboard (page 2-13). Button cover (page 2-15). CD/DVD (page 2-17). Display (page 2-18). Top case (page 2-20). Heatsink (page 2-26). Motherboard (page 2-34).	<b>Reassembly Notes:</b> After replacing the CMOS battery, set the correct time and date using the BIOS Setup utility or Date/Time in the Control Panel.
<b>Case, bottom</b>	See page 2-37.	
<b>Case, top</b>	See page 2-20.	
<b>CD/DVD drive</b>	See page 2-17.	
<b>Cover, button</b>	See page 2-15	
<b>CPU module</b>	See page 2-33.	
<b>Display assembly</b>	See page 2-18.	
<b>Doors, PCMCIA</b>	Keyboard cover (page 2-11). Keyboard (page 2-13). Button cover (page 2-15). CD/DVD (page 2-17). Display (page 2-18). Top case (page 2-20). Heatsink (page 2-26). Motherboard (page 2-34).	See page 2-37.
<b>Floppy drive</b>	See page 2-21.	
<b>Hard disk drive</b>	See page 2-8	
<b>Heatsink (with fans)</b>	See page 2-26.	
<b>Keyboard</b>	See page 2-13.	
<b>Keyboard cover/speaker assembly</b>	See page 2-11	

<b>Component</b>	<b>Removal Procedure</b>	<b>Additional Steps</b>
<b>Panel, wireless</b>	Keyboard cover (page 2-11). Keyboard (page 2-13). Button cover (page 2-15). CD/DVD (page 2-17). Display (page 2-18). Top case (page 2-20). Heatsink (page 2-26). Motherboard (page 2-34).	Press the tabs on both sides of the panel and then lift it from the bottom case.
<b>PCA, audio control</b>	See page 2-26	
<b>PCA, I/R</b>	See page 2-24.	
<b>PCA, left and right antennas (wireless models only)</b>	Keyboard cover (page 2-11). Keyboard (page 2-13). Button cover (page 2-15). CD/DVD (page 2-17). Display (page 2-18). Top case (page 2-20).	Disconnect the front antenna PCA cables from the mini-PCI card (page 2-7). Be careful not to bend the metal tabs on the bottom case when removing or replacing either of the two antenna PCAs.
<b>PCA, motherboard</b>	See page 2-34.	
<b>Shield, ESD</b>	See page 2-29	
<b>Socket, PCMCIA</b>	See page 2-28	



# Troubleshooting and Diagnostics

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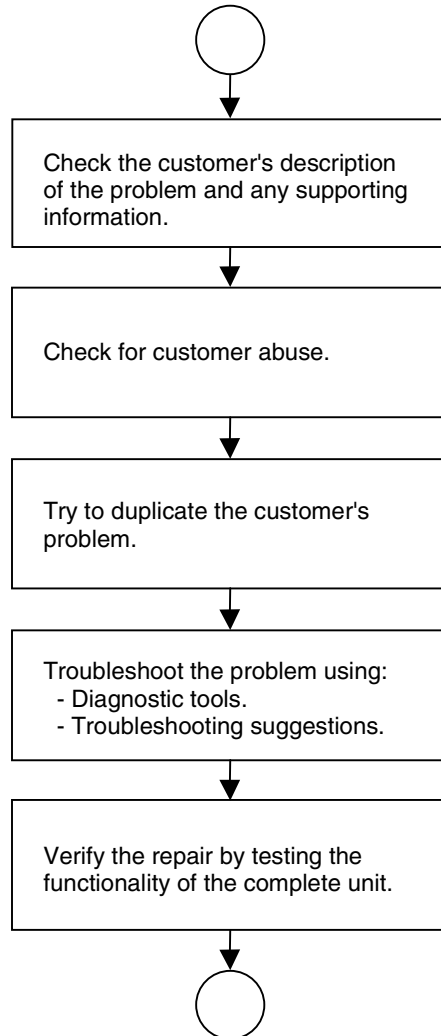
This chapter includes troubleshooting and diagnostic information for testing the functionality of the notebook, and for identifying faulty components:

- Troubleshooting information
  - Checking for customer abuse (page 3-3).
  - Troubleshooting the problem (page 3-3).
  - Verifying the repair (page 3-4).
  - Suggestions for troubleshooting (page 3-5).
- Diagnostic tools
  - e-Diagtools diagnostic program (page 3-17).
  - Power-on self-test (page 3-20).
  - Sycard PCCtest 450/460 PC card (page 3-25).
  - Windows Management Instrumentation (page 3-26).
  - BIOS Setup utility (page 3-27).

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# Troubleshooting

The suggestions in this section can help isolate and repair the cause of a problem. To ensure quality repair, follow the basic troubleshooting steps shown below.



**Figure 3-1. Basic Troubleshooting Steps**

## Checking for Customer Abuse

Some notebooks might appear to have been damaged by customer abuse. Use these guidelines to help determine if this is the case:

- If the shipping box is seriously damaged, customer abuse *cannot* be declared.
- If the damage *could have* a cause other than customer abuse, customer abuse *cannot* be declared.
- If the notebook shows any of the following, customer abuse is declared:
  - Missing parts.
  - Broken plastic parts.
  - Parts not original to the notebook.
  - Damaged or missing keys on the keyboard.

Table 3-2 lists additional criteria for determining customer abuse to specific parts of the notebook.

### Important

Parts damaged by customer abuse are not covered by the warranty.

## Troubleshooting the Problem

Record pertinent information about the notebook:

- Model and serial number.
- Operating system and version.
- Software version (stored in hidden file c:\version.inf).
- BIOS version.
- Accessories and peripherals used.

Analyze the problem:

- **Observe Symptoms.** Using the customer's information, try to duplicate the problem. Determine how the problem differs from proper behavior. Also, note the functions that *do* work properly.
- **Separate Problems.** If there are multiple symptoms, separate them into distinct problems.
- **Consider Causes.** Keep in mind possible causes for each problem. Use the diagnostic tools and troubleshooting suggestions to help find possible causes.
  - The e-Diagtools diagnostic program tests most of the notebook's components using automatic and interactive tests, and is your primary troubleshooting tool. Other tools include the power-on self-test, WMI/Toptools (if installed), the BIOS Setup utility, and the Sycard PCCtest. Table 3-1 on page 3-5 shows how you can use these tools to isolate the cause of the notebook's problem.
  - The troubleshooting suggestions on page 3-6 include general suggestions for repairing notebooks that show specific failure symptoms.

Swapping modules that might be defective with others known to be good is generally an ideal way to find the module responsible for the problem. A failure symptom is rarely caused by more than one module, so you will not usually need to replace more than one to correct a particular failure.

After you replace a module, the notebook will normally be in a confused state and lock up when you apply power. If this happens, press the reset button: this turns the notebook off, so that you can restart it in a known state.

## Verifying the Repair

Before returning the repaired notebook to the customer, verify the repair by running the following tests:

- **e-Diagtools Basic Diagnostic Test.** Run the basic test of the e-Diagtools diagnostic program (page 3-17).  
–and–
- **Function Tests.** Run tests that check the repaired function, such as those in e-Diagtools (page 3-17).  
–and–
- **Failed Tests.** Run any other tests that failed during troubleshooting.

## Suggestions for Troubleshooting

Table 3-1. Scope of Diagnostic Tools

Function	e-Diagtools	Power-On Self-Test	Sycard PCtest 450	WMI/ Tootools (if installed)	BIOS Setup
<b>Bootup</b>		Tests		Describes	Configures
<b>Processor</b>		Tests		Describes	
<b>Memory</b>	Tests	Tests		Describes	Describes
<b>Fan</b>	Tests				
<b>Batteries</b>		Tests (CMOS battery only)		Describes	
<b>Display</b>	Tests			Describes	Configures
<b>Hard disk</b>	Tests	Tests		Describes	Configures
<b>Floppy drive</b>	Tests*	Tests		Describes	Configures
<b>Keyboard</b>	Tests	Tests		Describes	
<b>Audio</b>	Tests				
<b>Serial</b>	Tests*			Describes	Configures
<b>Parallel</b>	Tests			Describes	Configures
<b>LAN</b>	Tests			Describes	Configures
<b>Modem</b>					Configures
<b>Wireless</b>					Configures
<b>Infrared</b>				Describes	Configures
<b>PS/2 port</b>	Tests†				Configures
<b>USB</b>				Describes	Configures
<b>Port replicator</b>					
<b>PCMCIA</b>	Tests		Tests	Describes	
<b>IEEE 1394</b>	Tests				
<b>AC adapter</b>				Status	
* Test might be available only on certain units.					
† Use an external keyboard to exercise the port. Run the external 101-key test.					

If you cannot isolate the cause of a problem using the above diagnostic tools, use the suggestions in the following table to help find the problem.

**Table 3-2. Troubleshooting Suggestions**

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
To help determine likely causes of a problem, determine which replaceable modules are involved in the system function and what roles they play: see the figure on page 1-12 and the table on page 1-13.			
<b>Startup</b>			
Does not boot on AC or battery.	<p>Check power source. Press and hold power button to turn notebook off, then press power button to turn notebook on.</p> <p>Unplug AC adapter, remove the battery and any PC cards, press reset button to turn notebook off, then reconnect power and try again.</p> <p>Do not use touch pad while booting or resuming.</p> <p>Remove all but one SDRAM module and try again. Reinsert any other SDRAM module and try again.</p>	<p>AC adapter.</p> <p>SDRAM module.</p> <p>CPU module.</p> <p>Button cover.</p> <p>Motherboard.</p> <p>Display assembly.</p> <p>Hard drive.</p>	<p>Check AC adapter. Remove all but one SDRAM module and try again.</p> <p>If power status light does not turn on, reprogram BIOS, replace top case, replace motherboard.</p> <p>If power status light turns on but display remains off, try external monitor. If monitor shows successful boot, replace display assembly. If monitor shows activity but BIOS does not complete, replace display assembly. If monitor is blank, replace button cover, replace motherboard.</p> <p>If power status light and display turn on, BIOS completes, but OS does not start from hard disk or floppy drive, replace CPU module, replace motherboard. If OS starts from floppy drive, reload hard drive, replace hard drive.</p>
Beeps once, spins hard disk, repeats, but does not boot.	Make sure at least one SDRAM module is installed.	SDRAM module.	
Does not boot on battery, but boots on AC.	<p>Make sure battery is properly installed and fully charged. Check battery level on battery LEDs.</p> <p>Check battery contacts. If available, try another battery.</p>	<p>Battery or contacts.</p> <p>Motherboard.</p>	
Does not boot from floppy drive.	<p>Make sure floppy disk is bootable.</p> <p>Use BIOS Setup to check default boot order.</p>	<p>Floppy disk or floppy drive.</p> <p>Motherboard.</p>	Make sure floppy drive is installed and connected correctly.
Does not boot from CD in CD/DVD drive.	<p>Make sure CD is bootable.</p> <p>Use BIOS Setup to check default boot order.</p> <p>Restart notebook.</p>	<p>CD/DVD drive.</p> <p>Motherboard.</p>	Make sure CD/DVD is installed and connected correctly.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Sluggish startup or shutdown.	Use Tools tab in disk's Properties sheet to check hard disk. Use Disk Defragmenter to optimize hard disk. Delete temporary and unneeded files.	Hard drive.	
Error message such as "Invalid system disk" or "Auto IDE error".	Check for disk in floppy drive. Check boot order in BIOS Setup. Remove and reinstall hard drive.	Hard drive contacts. Hard drive.	If notebook boots from floppy drive, check for corrupt files on hard drive, use <i>Recovery CDs</i> to reinstall factory software onto hard drive, replace hard drive.
Password forgotten.	Verify proper ownership, then follow removal procedure with owner and record appropriate data—see page 5-1.		User must call Technical Support and provide proof of ownership. Password removal is restricted to certain sites. See page 5-1.
<b>Power</b>			
No power.	Make sure charged battery is installed or AC adapter connected. Try another battery or AC adapter if available.	AC adapter. Battery. Motherboard.	
Notebook has short operating time when on battery.	Turn down display brightness. Check timeout settings in Power in Control Panel. Check power management settings in BIOS Setup. Try default settings. Battery gauge might need calibration. Run HP Battery Optimizer from Start menu. Certain applications can cause excess CPU and power usage. (User can get Intel Power Monitor from <a href="http://www.intel.com">www.intel.com</a> and monitor CPU load.) When playing DVD movies on battery power, use Power Options in Control Panel to select Portable/Laptop power scheme. When using applications with automatic save feature (such as MS Word), extend save time or disable to reduce hard disk access and power usage. PCMCIA card use can affect battery life. Some PCMCIA cards draw power even while not in use. Heavy modem use can affect battery operating time.	Battery. Motherboard.	Battery capacity often decreases after a year or more.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Turns off immediately after turning on.	Battery may be extremely low. Plug in AC adapter or insert charged battery	Battery.	
Does not run on battery; empty battery indication.	Check battery and contacts. Try another battery if available.	Battery or contacts. Motherboard.	
Beeps repeatedly.	Notebook beeps repeatedly when battery is low. Connect AC adapter or replace battery.	Battery.	
Battery does not charge.	Make sure AC adapter has correct power rating. Make sure AC adapter is connected properly and battery installed properly. Check battery contacts. If available, try another battery and AC adapter. Move notebook away from any nearby heat source. Unplug AC adapter and allow battery to cool. Check for blocked air vents.	Battery or contacts. AC adapter. Motherboard. Heatsink.	Check battery and AC adapter. Check heatsink.
AC adapter does not power notebook.	Try another AC adapter, if available.	AC adapter. Motherboard.	AC adapter cannot be repaired, and must be replaced.
Battery indicator is inaccurate.	Time Remaining is an estimate based on notebook's power use at that moment. It therefore depends on current task, and assumes power will be used at that rate until battery runs out. So if notebook is currently using good deal of power (such as when reading CD or DVD), Time Remaining likely shows less time than actually remains.		
<b>Standby/resume</b>			
General problems.	Close all applications before entering (or allowing notebook to enter) Standby or Hibernate mode. If problem appears after installing new software (including drivers), uninstall that software. Contact software vendor for additional support.		



Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Notebook resumes slowly from Standby mode.	Notebook can take a minute or longer to resume if network card is installed. Blinking cursor appears while system is loading and checking hardware and network connections. When hardware is reinitialized, Windows desktop appears.		
Does not suspend to Standby mode as expected.	Notebook won't suspend if connection to another computer is active. If notebook is busy, it normally finishes current operation before suspending.		
Does not automatically enter Hibernate mode as expected.	Make sure hibernate support is enabled in Power in Control Panel. Also, make sure Hibernate timeouts (Power Schemes tab) for AC and battery power are not set to Never.		
<b>Display</b>			
Dark display, no light.	Make sure notebook is turned on and warmed up. Check power supply. Make sure SDRAM modules are installed properly. Adjust display brightness. Press Fn+F5 several times. Try external monitor.	Display cable connection. SDRAM modules. CPU module. Display assembly. Motherboard.	Check cable connections. Replace SDRAM modules. Make sure CPU module is installed properly, replace CPU module. Check display cable connections, replace display assembly. If external monitor displays no image, replace motherboard.
White display.	Adjust display brightness.	Display assembly. Button cover.	
Erratic display.		Display cable connection. Button cover. Display assembly. Motherboard.	Check display cable connection.
Bright or missing pixels or lines.	See quality statement on page 5-2.	Display cable connection. Display assembly.	Check display cable connection. See quality statement on page 5-2.
Punctured display.			Declared to be caused by customer abuse.
Vertical crack near center of display.		Usually caused by closing display with pencil-sized object on keyboard.	Declared to be caused by customer abuse.
Scratched display glass.			Declared to be caused by customer abuse.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Local area of dark or light discoloration visible when display is on.		Caused by excessive pressure applied to area on screen.	Declared to be caused by customer abuse.
External display does not work.	Check connections. Press Fn+F5 several times. Try display on another computer.	External display. Motherboard.	
<b>Hard disk</b>			
Hard disk never spins.	Check power source. Remove and reinstall hard drive. Check connector.	Hard drive or connector. Motherboard.	If drive case is damaged, drive may not operate properly.
Hard disk makes clunking or scratching noise.	Back up disk immediately. Was notebook or drive dropped?	Hard drive.	Check notebook and drive for evidence of customer abuse.
Hard disk makes buzzing or whining noise.	Back up disk immediately. Check hard disk installation. Check for alternate noise sources, such as PCMCIA drive or fan.	Depends on noise source.	
Files corrupted.	Run virus scan program. Check hard disk using Tools tab in disk's Properties sheet. Test hard disk drive with e-Diagtools diagnostics. Back up files if possible, then use <i>Recovery CDs</i> to reformat hard disk and reinstall factory software.		
Disk capacity less than normal.	Check hard disk using Tools tab in disk's Properties sheet. Check partitions using Control Panel, Administrative Tools, Computer Management under Storage. Use <i>Recovery CDs</i> to reformat hard disk and reinstall factory software.	Hard drive.	
Disk's reported capacity is less than actual size	Hard disk allocates approximately 20 MB to diagnostic software. This space is unavailable for other uses, and not included in hard disk capacity reported by Windows.		
<b>Floppy drive</b>			
General problems.	No response from floppy drive.	Floppy drive. Motherboard.	Make sure floppy drive is installed and connected correctly.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>CD/DVD drive</b>			
Particular CD or DVD not playing properly.	Check disk for proper insertion, dirt, or damage. Clean with soft cloth or replace as needed. If CD was created on CD-RW drive, try using HP certified media. Read and write quality can vary for other media.		
Cannot read any CD or DVD.	Restart notebook. Make sure CD/DVD drive is installed properly.	CD/DVD drive.	
DVD movie stops playing.	DVD may be double-sided. Movie may be paused. Press Play button.		
Region Code error.	DVDs contain embedded regional codes that prevent them from playing outside region in which they are sold. This error occurs when trying to play DVD intended for different region. <b>Important:</b> Most DVD drives allow region code to be changed only a limited number of times (usually no more than four). When this limit is reached, last change is hard-coded on DVD drive, and is permanent. Refer to DVD player software help for details.		HP warranty does not cover expense of correcting this situation.
“System Error: Unable to read drive” message.	Make sure disk is clean, undamaged, and inserted correctly. Clean with soft cloth or replace as needed. Wait 5 to 10 seconds after closing tray before pressing Play. Restart notebook.	CD/DVD drive. Motherboard.	Make sure CD/DVD drive is installed properly.
No DVD or CD-RW software on notebook.	If software was removed, use the <i>Recovery CDs</i> to reinstall factory software.		
All DVD play is erratic.	Some DVDs include software called “PC Friendly”. This software can cause errors or erratic play. If needed, uninstall PC Friendly and restart notebook.		
<b>Keyboard</b>			
Some or all keys do not work properly.	Check settings in Control Panel.	Keyboard. Motherboard.	Try reinserting ribbon cable in connector on motherboard.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Embedded numeric keypad does not work.	Press Fn+F8 to activate numeric keypad, and Lock key to turn on number lock. Avoid touching touch pad while booting or resuming.	Keyboard. Motherboard.	
PS/2 keyboard and mouse with Y-adapter do not work.	Check devices separately.	Y-adapter. PS/2 device. Motherboard.	
<b>Touch pad</b>			
General problems.	Reset notebook (see page 1-8). Check settings in Control Panel. Make sure touch pad is enabled in Mouse Properties. By default, touch pad is disabled if external PS/2 mouse is connected, Use BIOS Setup to check settings. Avoid touching touch pad while booting or resuming.	Top case. Motherboard.	
Special touch pad features not working.	In Mouse Properties, select Synaptics PS/2 TouchPad driver. (Driver is installed from \hp\drivers\touchpad.)	Top case. Motherboard.	
Click button does not work.		Top case. Motherboard.	
<b>Memory</b>			
Out of memory error.	Make sure C drive has adequate free space. Delete temporary and unneeded files. Use memory troubleshooter in Windows Help. Not all third-party memory cards have been tested for use with notebook.	SDRAM module.	
Notebook does not boot after adding SDRAM.	Use only DDR-266 SDRAM modules.	SDRAM module.	
<b>Audio</b>			
No sound audible.	Increase sound volume. Check whether sound is enabled (mute button and software controls). Check for sound resource conflicts in Device Manager. Test audio with e-Diagtools diagnostics.	Top case. Keyboard cover/speaker assembly. Button cover. Motherboard.	Check operation using headphones or external speakers (audio control PCA). Make sure keyboard cover/speaker assembly cable is connected.
Sound does not record.	Use an external microphone. Check software controls. Test audio with e-Diagtools diagnostics.	Button cover. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>Serial/Paralle/USB</b>			
General problems.	<p>Check connections. Restart notebook. Use troubleshooters in Windows Help. Check settings in Control Panel. Check port settings in Device Manager. Test ports with e-Diagtools diagnostics. For USB: contact device vendor and HP Notebook web site (see page vii) for latest USB drivers. For USB: if the device is powered by the USB port, try the other port.</p>	Motherboard.	
<b>Modem</b>			
General problems.	<p>Check settings in Control Panel. Open hardware Device Manager. If modem is disabled, try to enable. If modem has a conflict, try disabling another device. Use analog telephone line (2, 3, or 4 wires), not PBX or digital line. In a hotel, ask for data line. Try disabling error correction and data compression. Test modem with e-Diagtools diagnostics.</p>	Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>LAN/network</b>			
General problems.	<p>Check cables and connections.</p> <p>Try connecting notebook to another network station (if applicable). If green light next to LAN port does not light, LAN cable may not be connected to network or network may be down.</p> <p>Use networking troubleshooter in Windows Help.</p> <p>Check settings in Control Panel.</p> <p>Make sure LAN cable is Category 3, 4, or 5 for 10Base-T operation, or Category 5 for 100Base-TX operation. Maximum cable length is 100 meters (330 feet).</p> <p>Test LAN with e-Diagtools diagnostics.</p>	Motherboard.	
<b>Infrared</b>			
General problems.	<p>Infrared is disabled and no drivers installed as shipped. (Drivers are included.)</p> <p>Make sure line between infrared ports is not blocked, ports face each other squarely and are no more than 1 meter apart. Sunlight, heat from nearby equipment, or other sources of infrared radiation can cause transmission errors.</p> <p>Open Hardware Device Manager. Try to enable the infrared port.</p> <p>Remove any PC cards from notebook (possible IRQ conflict).</p> <p>For fast-IrDA, check for DMA conflict with ECP parallel port.</p>	Motherboard. I/R PCA.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>Wireless</b>			
General problems.	Check TCP/IP setup in Control Panel. Check SSID, channel, and encryption settings.	Mini-PCI card. Antenna PCAs. Motherboard.	Make sure all cables are properly connected to mini-PCI card and motherboard. Check for damaged coaxial cables or connectors.
<b>One-Touch button problems</b>			
Buttons not working properly.	Make sure correct applications are associated with buttons in One-Touch tab of Keyboard in Control Panel.	Keyboard cover/speaker assembly. Button cover. Motherboard.	
On-screen display does not appear when button is pressed.	Make sure Onscreen Display is enabled in One-Touch tab of Keyboard in Control Panel.		
<b>PCMCIA</b>			
General problems.	Restart notebook. Try card in another computer. If card requires an IRQ, make sure one is available. In Device Manager, refresh device list and check for conflicts. Download current drivers from card manufacturer's web site.	PCMCIA socket. Motherboard.	Using a flashlight, look for bent pins inside the PCMCIA socket. If only one slot is affected, replace PCMCIA socket. If both slots are affected, replace motherboard.
<b>AC adapter</b>			
Does not power notebook.	Make sure AC adapter has correct power rating. Try another AC adapter, if available.	AC adapter. Motherboard.	AC adapter cannot be repaired and must be replaced.
<b>Motherboard</b>			
Evidence of spilled liquid.			Declared to be caused by customer abuse.
Bent or broken connectors, or burnt component.			Declared to be caused by customer abuse.
Motherboard cracked.			Declared to be caused by customer abuse.
<b>Miscellaneous</b>			
Clock loses time	Plug in AC adapter for 24 hours to charge CMOS battery.	CMOS battery. Motherboard.	Charge CMOS battery.
Notebook gets abnormally hot.	Always set notebook on a flat surface, so air can flow freely around and underneath it Make sure air vents are not blocked. Games and other programs that drive CPU usage toward 100% can contribute.	Heatsink.	Check heatsink for damage or proper fan operation. Check thermal contact between CPU and heatsink. Replace thermal pad if needed.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Notebook pauses or runs sluggishly.	<p>May be normal Windows behavior (background processing can affect response time).</p> <p>Certain operations (such as virus scanning or file browsers) can affect performance.</p> <p>Press Ctrl+Alt+Del to see if an application is not responding.</p> <p>Restart notebook.</p> <p>If hard disk has spun down to conserve power, it can take several seconds to spin up (you can hear this). Use Control Panel to modify hard disk power settings.</p> <p>Check for overheating—see previous symptom.</p> <p>If notebook's hard drive frequently runs (as indicated by hard drive light on front of notebook) while notebook appears to be paused or running slowly, consider installing additional SDRAM.</p> <p>Make sure hard drive has adequate free space. Delete temporary and unneeded files.</p>	CPU module. Motherboard.	If notebook slows after period of continuous activity, check heatsink—see previous symptom.
Notebook still on but stops responding.	<p>Press Ctrl+Alt+Del and end any application not responding.</p> <p>Reset notebook (see page 1-8).</p>		
<b>Accessories</b>			
Port replicator problems.	<p>Check notebook's power supply.</p> <p>Check settings in BIOS Setup.</p>	Port replicator. Motherboard.	Port replicator is not repairable, and must be exchanged.



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## Diagnostic Tools

This section describes the following diagnostic tools you can use for troubleshooting and repairing the notebook:

- Notebook e-Diagtools diagnostic program (below).
- Power-on self-test (page 3-19).
- Sycard PCCtest 450 PC card (page 3-25).
- Windows Management Instrumentation (page 3-26).
- BIOS Setup utility (page 3-27).

### e-Diagtools Diagnostic Program

The hardware diagnostic programs provide two levels of testing:

- User-level testing using a basic hardware test.
- Advanced testing using individual hardware tests.

The tests are designed to run after the system reboots, so that the notebook will be in a predictable state during the tests. The tests are non-destructive, and are intended to preserve the state of the notebook. The notebook reboots when you exit the program so drivers can be loaded.

### Updating e-Diagtools

You can download the latest version of e-Diagtools using e-Diagtools for Windows.

## Running e-Diagtools

The following procedure describes how to run e-Diagtools. The individual steps might differ slightly for different versions of e-Diagtools.

1. Click Start, Turn Off Computer (or Shut Down), Restart.
2. When the HP logo appears, press F10 to start the diagnostic test.

The first time you run the program, you are prompted to select the language for the program.

3. When the menu appears, press F2 to run e-Diagtools.
4. When the Configuration Description appears, check the list of detected hardware.
5. **Run the basic test.** Press F2 to start the basic hardware test. The results appear when the test is complete.
6. If you intend to exit without running the advanced tests, press F4 to view the Support Ticket. Press F3 to exit e-Diagtools.
7. **Optional: run the advanced tests.** Press F2 to open the advanced test screen.
8. Use the arrow keys and ENTER to select the test you want to run. Tests are listed only for detected hardware.
9. Press F2 to run the selected tests and add the results to the Support Ticket.
10. After each run, press F2 to return to the advanced test screen, or press F4 to view the Support Ticket.
11. **Exit.** Press F3 and then any key to exit and reboot.
12. **Optional: open the Support Ticket.** In Windows, click Start, All Programs (or Programs), Hewlett-Packard, Notebook, HP e-Diagtools, e-Diagtools for Windows.
13. Click View to display the Support Ticket.
14. To add information about your problem, click Comments, type the information, and then click OK.  
To save or print the Support Ticket, click Save As or Print.

To e-mail the Support Ticket to your support agent, click e-Mail. The first time you make an e-mail connection from this program, click Change Settings in the Connect window and enter the settings recommended by your support agent.

e-Diagtools for Windows can also update the version of e-Diagtools on your notebook's hard disk. In e-Diagtools for Windows, use the e-Diagtools menu.

If you have trouble running e-Diagtools diagnostics from the hard disk, you can also run it from the *Recovery CD* or *DVD*. Boot from the CD or DVD and select the diagnostics option.

## **Interpreting the Results**

The e-Diagtools diagnostic program returns test groups, error codes, and suggestions for repair and/or follow-up actions. The basic hardware test shows a recommended replacement part.

To help interpret the results of the e-Diagtools tests, refer to the following:

- e-Diagtools Support Ticket on page 3-18.
- Replaceable Module Diagram on page 1-12
- Functional Structure Description on page 1-13

This combined information should enable you to determine which of the notebook's components require service.

## Power-On Self-Test

### Note

If Quiet Boot is enabled in BIOS Setup (the default setting), press Esc during boot to see POST messages.

When the notebook boots, its system BIOS runs a series of initialization routines and diagnostic tests called POST (Power-On Self-Test). The BIOS will not boot the notebook's operating system if the system memory, CPU, DMA, or interrupt controller fails the POST diagnostic tests. POST indicates progress by a sequence of codes; if an error occurs, the BIOS displays a message and/or issues a beep code.

Note that not all POST messages indicate a failure in the notebook—some messages are for information only. You should not necessarily interpret the failure of one or more POST tests as a hardware, software, or firmware failure. If POST displays an error message or issues a beep code indicating an error, *confirm the problem using other diagnostic tools*.

First, confirm the failure by performing a “clean” boot, as described below. Note that if the notebook fails to restart with a clean boot, it requires repair.

1. Remove all accessories, including SDRAM modules, port replicator, PC cards, printer, external monitor, pointing device, and keyboard.
2. Provide “clean” AC power—no auto adapter or unusual AC adapter configuration.
3. Press the reset button to return the notebook to a known state.
4. Press the power button to start the notebook.

If the BIOS detects a terminal error condition, it halts POST after issuing a beep code and/or displaying a message (see the following table). The beep code indicates the POST routine in which the terminal error occurred.

**Table 3-3. POST Terminal-Error Beep Codes**

Beep Codes*	POST Description
1	One short beep before boot.
1-2	Search for option ROMs.
1-1-1-3	Verify Real Mode.
1-1-1-4	Disable Non-Maskable Interrupt (NMI).
1-1-2-1	Get CPU type.
1-1-2-3	Initialize system hardware.
1-1-2-4	Disable shadow and execute code from ROM.
1-1-3-1	Initialize chipset with initial POST values.
1-1-3-2	Set IN POST flag.
1-1-3-3	Initialize CPU registers.
1-1-3-4	Enable CPU cache.
1-1-4-1	Initialize caches to initial POST values.
1-1-4-3	Initialize I/O component.
1-1-4-4	Initialize local bus IDE.
1-2-1-1	Initialize Power Management.
1-2-1-2	Load alternate registers with initial POST values.
1-2-1-3	Restore CPU control word during warm boot.
1-2-1-4	Initialize PCI Bus Mastering devices.
1-2-2-1	Initialize keyboard controller.
1-2-2-3	BIOS ROM checksum.
1-2-2-4	Initialize cache before memory Auto size.
1-2-3-1	8254 timer initialization.
1-2-3-3	8237 DMA controller initialization.
1-2-4-1	Reset Programmable Interrupt Controller.
1-3-1-1	Test DRAM refresh.

Beep Codes*	POST Description
1-3-1-3	Test 8742 Keyboard Controller (on motherboard).
1-3-2-1	Set ES segment register to 4 GB.
1-3-3-1	Auto size DRAM; or wrong type or no RAM installed.
1-3-3-2	Initialize POST Memory Manager.
1-3-3-3	Clear 512 kB base RAM.
1-3-4-1	RAM failure on address line xxxx.
1-3-4-3	RAM failure on data bits xxxx of low byte of memory bus.
1-3-4-4	Enable cache before system BIOS shadow.
1-4-1-1	RAM failure on data bits xxxx of high byte of memory bus.
1-4-1-3	Test CPU bus-clock frequency.
1-4-1-4	Initialize Phoenix Dispatch Manager.
1-4-2-3	Warm start shut down.
1-4-3-1	Shadow system BIOS ROM.
1-4-3-3	Auto size cache.
1-4-4-1	Advanced configuration of chipset registers.
1-4-4-2	Load alternate registers with CMOS values.
2-1-1-2	Initialize extended memory for RomPilot.
2-1-1-3	Initialize interrupt vectors.
2-1-2-2	POST device initialization.
2-1-2-3	Check ROM copyright notice.
2-1-2-4	Initialize I20 support.
2-1-3-1	Check video configuration against CMOS.
2-1-3-2	Initialize PCI bus and devices.
2-1-3-3	Initialize all video adapters in system.
2-1-3-4	QuietBoot start (optional).
2-1-4-1	Shadow video BIOS ROM.
2-1-4-3	Display BIOS copyright notice.
2-1-4-4	Initialize MultiBoot.
2-2-1-1	Display CPU type and speed.
2-2-1-2	Initialize EISA board.
2-2-1-3	Test keyboard.
2-2-2-1	Set key click if enabled.
2-2-2-2	Enable USB devices.
2-2-3-1	Test for unexpected interrupts.
2-2-3-2	Initialize POST display service.
2-2-3-3	Display prompt "Press F2 to enter SETUP".
2-2-3-4	Disable CPU cache.
2-2-4-1	Test RAM between 512 and 640 kB.
2-3-1-1	Test extended memory.
2-3-1-3	Test extended memory address lines.
2-3-2-1	Jump to UserPatch1.
2-3-2-3	Configure advanced cache registers.
2-3-2-4	Initialize Multi Processor APIC.
2-3-3-1	Enable external and CPU caches.
2-3-3-2	Set up System Management Mode (SMM) area.
2-3-3-3	Display external L2 cache size.
2-3-3-4	Load custom defaults (optional).
2-3-4-1	Display shadow-area message.
2-3-4-3	Display possible high address for UMB recovery.
2-4-1-1	Display error messages.
2-4-1-3	Check for configuration errors.
2-4-2-3	Check for keyboard errors.
2-4-4-1	Set up hardware interrupt vectors.
2-4-4-2	Initialize Intelligent System Monitoring.
2-4-4-3	Initialize coprocessor if present.
3-1-1-1	Disable onboard Super I/O ports and IRQs.
3-1-1-2	Late POST device initialization.
3-1-1-3	Detect and install external RS232 ports.
3-1-1-4	Configure non-MCD IDE controllers.
3-1-2-1	Detect and install external parallel ports.
3-1-2-2	Initialize PC-compatible PnP ISA devices.
3-1-2-3	Re-initialize onboard I/O ports.
3-1-2-4	Configure Motherboard Configurable Devices (optional).
3-1-3-1	Initialize BIOS Data Area.
3-1-3-2	Enable Non-Maskable Interrupts (NMIs).
3-1-3-3	Initialize Extended BIOS Data Area.
3-1-3-4	Test and initialize PS/2 mouse.
3-1-4-1	Initialize floppy controller.
3-1-4-4	Determine number of ATA drives (optional).
3-2-1-1	Initialize hard-disk controllers.
3-2-1-2	Initialize local-bus hard-disk controllers.
3-2-1-3	Jump to UserPatch2.

Beep Codes*	POST Description
3-2-1-4	Build MPTABLE for multi-processor boards.
3-2-2-2	Install CD-ROM for boot.
3-2-2-3	Clear huge ES segment register.
3-2-2-4	Fix up Multi Processor table.
3-2-3-2	Check for SMART Drive (optional).
3-2-3-3	Shadow option ROMs.
3-2-4-1	Set up Power Management.
3-2-4-2	Initialize security engine (optional).
3-2-4-3	Enable hardware interrupts.
3-2-4-4	Determine number of ATA and SCSI drives.
3-3-1-1	Set time of day.
3-3-1-3	Check key lock.
3-3-2-1	Initialize typematic rate.
3-3-3-1	Erase F2 prompt.
3-3-3-3	Scan for F2 keystroke.
3-3-4-1	Enter SETUP.
3-3-4-3	Clear Boot flag.
3-4-1-1	Check for errors.
3-4-1-2	Inform RomPilot about the end of POST.
3-4-1-3	POST done - prepare to boot OS.
3-4-2-2	Terminate QuietBoot (optional).
3-4-2-3	Check password (optional).
3-4-2-4	Initialize ACPI BIOS.
3-4-3-2	Prepare Boot.
3-4-3-3	Initialize SMBIOS.
3-4-3-4	Initialize PnP Option ROMs.
3-4-4-1	Clear parity checkers.
3-4-4-2	Display MultiBoot menu.
3-4-4-3	Clear screen (optional).
3-4-4-4	Check virus and backup reminders.
4-1-1-1	Try to boot with INT 19.
4-1-1-2	Initialize POST Error Manager (PEM).
4-1-1-3	Initialize error logging.
4-1-1-4	Initialize error display function.
4-1-2-1	Initialize system error handler.
4-1-2-2	PnPnd dual CMOS (optional).
4-1-2-3	Initialize note dock (optional).
4-1-2-4	Initialize note dock late.
4-1-3-1	Force check (optional).
4-1-3-2	Extended checksum (optional).
4-1-3-3	Redirect Int 15h to enable remote keyboard.
4-1-3-4	Redirect Int 13h to Memory Technologies Devices such as ROM, RAM, PCMCIA, and serial disk.
4-1-4-1	Redirect Int 10h to enable remote serial video.
4-1-4-2	Re-map I/O and memory for PCMCIA.
4-1-4-3	Initialize digitizer and display message.
4-2-1-3	Unknown interrupt.
4-3-1-1	Initialize the chipset.
4-3-1-2	Initialize the bridge.
4-3-1-3	Initialize the CPU.
4-3-1-4	Initialize system timer.
4-3-2-1	Initialize system I/O.
4-3-2-2	Check force recovery boot.
4-3-2-3	Checksum BIOS ROM.
4-3-2-4	Go to BIOS.
4-3-3-1	Set Huge Segment.
4-3-3-2	Initialize Multi Processor.
4-3-3-3	Initialize OEM special code.
4-3-3-4	Initialize PIC and DMA.
4-3-4-1	Initialize Memory type.
4-3-4-2	Initialize Memory size.
4-3-4-3	Shadow Boot Block.
4-3-4-4	System memory test.
4-4-1-1	Initialize interrupt vectors.
4-4-1-2	Initialize Run Time Clock.
4-4-1-3	Initialize video.
4-4-1-4	Initialize System Management Manager.
4-4-2-1	Output one beep.
4-4-2-2	Clear Huge Segment.
4-4-2-3	Boot to Mini DOS.
4-4-2-4	Boot to Full DOS.
1 long, 2 short	Improper video configuration (replace motherboard) or external ROM checksum failure.

The following table lists POST messages and explanations for reported problems. If the system fails after you make changes in BIOS Setup, reset the notebook, enter BIOS Setup, and install the defaults or correct the error.

**Table 3-4. POST Messages**

Message	Description
<b>0200 Failure Fixed Disk</b>	Fixed (hard) disk is not working or not configured properly. Make sure the hard disk is installed properly. Run BIOS Setup and make sure the hard disk type is correctly identified.
<b>0210 Stuck key</b>	Stuck key on keyboard.
<b>0211 Keyboard error</b>	Keyboard is not working.
<b>0212 Keyboard Controller Failed</b>	Keyboard controller failed the test. might require replacing the motherboard (contains the keyboard controller).
<b>0213 Keyboard locked – Unlock key switch</b>	Unlock the system to proceed.
<b>0220 Monitor type does not match CMOS – Run SETUP</b>	Monitor type is not correctly identified in BIOS Setup.
<b>0230 Shadow RAM Failed at offset: <i>nnnn</i></b>	Shadow RAM failed at offset <i>nnnn</i> of the 64k block at which the error was detected.
<b>0231 System RAM Failed at offset: <i>nnnn</i></b>	System RAM failed at offset <i>nnnn</i> of the 64k block at which the error was detected.
<b>0232 Extended RAM Failed at offset: <i>nnnn</i></b>	Extended memory is not working or not configured properly at offset <i>nnnn</i> . Update to the latest BIOS version.
<b>0250 System battery is dead – Replace and run SETUP</b>	CMOS clock battery indicator shows that the CMOS battery is dead. Connect the AC adapter for at least 24 hours, then run BIOS Setup to reconfigure the system.
<b>0251 System CMOS checksum bad – Default configuration used</b>	System CMOS has been corrupted or modified incorrectly, perhaps by an application that changes CMOS data. In response, the BIOS has installed the default Setup values. Use BIOS Setup to modify these values if needed. If the error persists, check the system battery. Connect the AC adapter for at least 24 hours; replace the motherboard.
<b>0260 System timer error</b>	Timer test failed. Replace the motherboard.
<b>0270 Real time clock error</b>	Real-time clock failed the BIOS test. Might require replacing the motherboard.
<b>0271 Check date and time settings</b>	BIOS found the date or time to be out of range, and reset the real-time clock. You might need to use BIOS Setup to reset the legal date.
<b>0280 Previous boot incomplete – Default configuration used</b>	Previous POST did not complete successfully. POST loads default values and offers to run BIOS Setup. If the failure was caused by incorrect values that are not corrected, the next boot will likely fail. This error is cleared the next time the system is booted.
<b>0281 Memory Size found by POST differed from CMOS</b>	Memory size found by POST differed from that specified in CMOS.
<b>02B0 Diskette drive A error</b>	Drive A: is present but fails the BIOS POST diskette tests. Make sure the drive is defined with the proper diskette type in BIOS Setup and that the drive is connected correctly.
<b>02B2 Incorrect Drive A type – run SETUP</b>	Type of floppy drive A: not correctly identified in BIOS Setup.
<b>02D0 System cache error – Cache disabled</b>	RAM cache failed and BIOS disabled the cache. May require replacing the motherboard. A disabled cache slows system performance considerably.
<b>02F0: CPU ID:</b>	CPU socket number for Multi-Processor error.

Message	Description
<b>02F4: EISA CMOS not writeable</b>	ServerBIOS2 test error: Cannot write to EISA CMOS.
<b>02F5: DMA Test Failed</b>	ServerBIOS2 test error: Cannot write to extended Direct Memory Access (DMA) registers.
<b>02F6: Software NMI Failed</b>	ServerBIOS2 test error: Cannot generate software Non-Maskable Interrupt (NMI).
<b>02F7: Fail-Safe Timer NMI Failed</b>	ServerBIOS2 test error: Fail-safe timer takes too long.
<b>device Address Conflict</b>	Address conflict for the specified device.
<b>Allocation Error for: device</b>	Run ISA or EISA Configuration Utility to resolve a resource conflict for the specified device.
<b>CD ROM Drive</b>	CD-ROM drive identified.
<b>Entering SETUP ...</b>	Starting BIOS Setup.
<b>Failing Bits: nnnn</b>	Hex number <i>nnnn</i> is a map of the bits at the RAM address that failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.
<b>Fixed Disk n</b>	Fixed disk <i>n</i> (0–3) identified.
<b>Invalid System Configuration Data</b>	Problem with NVRAM (CMOS) data.
<b>I/O device IRQ conflict</b>	I/O device IRQ conflict error.
<b>PS/2 Mouse Boot Summary Screen:</b>	PS/2 mouse installed.
<b>nnnn kB Extended RAM Passed</b>	Where <i>nnnn</i> is the amount of RAM in kB successfully tested.
<b>nnnn Cache SRAM Passed</b>	Where <i>nnnn</i> is the amount of system cache in kB successfully tested.
<b>nnnn kB Shadow RAM Passed</b>	Where <i>nnnn</i> is the amount of shadow RAM in kB successfully tested.
<b>nnnn kB System RAM Passed</b>	Where <i>nnnn</i> is the amount of system RAM in kB successfully tested.
<b>Operating system not found</b>	Operating system cannot be located on drive A: or drive C:. Enter BIOS Setup and see if the hard disk and drive A: are properly identified.
<b>Parity Check 1 nnnn</b>	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. Parity is a method for checking errors in binary data. A parity error indicates that data has been corrupted.
<b>Parity Check 2 nnnn</b>	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen.
<b>Press &lt;F1&gt; to resume, &lt;F2&gt; to Setup, &lt;F3&gt; for previous</b>	Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter BIOS Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an Option ROM, such as an add-on card). Write down and follow the information shown on the screen.
<b>Press &lt;F2&gt; to enter Setup</b>	Optional message displayed during POST.
<b>PS/2 Mouse:</b>	PS/2 mouse identified.



<b>System BIOS shadowed</b>	System BIOS copied to shadow RAM.
<b>UMB upper limit segment address: <i>nnnn</i></b>	Displays the address <i>nnnn</i> of the upper limit of Upper Memory Blocks (UMB), indicating released segments of the BIOS that can be reclaimed by a virtual memory manager.
<b>Video BIOS shadowed</b>	Video BIOS copied to shadow RAM.

## Sycard PCCTest 450/460 PC Card (Optional)

The PCCTest 450 and 460 cards (version 1.05) from Sycard Technology are the only recommended diagnostic tools that test the functionality of the PCMCIA slots using a PCMCIA card. Each is a Type II PC card that works with test software to exercise PCMCIA functions. (For details, see the Sycard Technology web site: <http://www.sycard.com>).

The PCCTest product contains these components:

- PCCTest 450 or 460 (revision 1.05) PC card.
- PCCTest 450/460 software disk. (Software updates are available at the Sycard Technology web site.)
- Configuration headers (PC card/16-bit and CardBus/32-bit) that attach to the card.

You will also need a CardBus extender card (such as the Sycard PCCextend 70) to avoid wear on the Sycard PCMCIA connector.

Use the following tests to check the function of the notebook's PCMCIA slots. See the Sycard documentation for details about running the tests.

**Table 3-5. Sycard PCCTest Commands**

	<b>Slot</b>	<b>PCMCIA PC card (16-bit) test</b> (PC card configuration header)	<b>CardBus (32-bit) test</b> (CardBus configuration header)
<b>Omnibook XE4400</b> <b>(PCI 1520)</b>	Upper	pct450-v-1-b80	testcb-v-1-b80
	Lower	pct450-v-0-b80	testcb-v-0-b80

## Windows Management Instrumentation (WMI)

The Windows Management Instrumentation is basically sets of rules for accessing information about a notebook. WMI allows an application to determine, for example, the operating system being used, which hardware and software components are in the notebook, and possibly whether any of the components need replacing. A local or remote application can use the WMI interface to check which hardware and software components are installed on your notebook, and might be able to tell how well they are working or if they need replacement.

### Installing the WMI Package

The WMI package is either preinstalled on the notebook's hard disk or can be downloaded from <http://www.hp.com/toptools> (the contents are the same in both cases). The package must be properly installed before it can be used.

To install the WMI preloaded on the hard disk:

1. Start Windows, if it is not already running.
2. Click Start, Programs (or All Programs), Hewlett-Packard, HP Toptools Agent, Setup.

### Using WMI

For a complete description of how to use WMI, see the following documentation provided with the notebook:

- A README.TXT file: click Start, Programs, Hewlett-Packard, HP Toptools Agent, Read me.
- A Windows online help file describing Hewlett-Packard's implementation of WMI (group and attribute definitions): click Start, Programs Hewlett-Packard, HP Toptools Agent, HP Toptools Help.

### Uninstalling the WMI Package

1. Click Start, Programs (or All Programs), Hewlett-Packard, HP Toptools Agent, Uninstall WMI.
2. Restart the notebook.

## BIOS Setup Utility

The BIOS Setup utility provides access to the notebook's basic configuration settings. It is independent of the operating system.

### Running the BIOS Setup Utility

1. Close all applications, then restart the notebook: click Start, Turn Off Computer, Restart. (If necessary, you can press Ctrl+Alt+Del to restart.)
2. When the HP logo appears, press F2 to enter the BIOS Setup utility.
3. The pointing devices are not active in BIOS Setup, so you will need to use the keyboard to navigate:
  - Press the LEFT and RIGHT arrow keys to move among menus.
  - Press the UP and DOWN arrow keys to move among parameters in a menu.
  - Press F5 or F6 to move through values for the current parameter, or press Enter to change a setting.
4. After you select the options you want, press F10 or use the Exit menu to exit BIOS Setup.

If the settings cause a conflict between devices during reboot, the system prompts you to run BIOS Setup, and marks the conflicting settings.

#### Note

The listings in the following table are for the initial XE4400 BIOS release, and might differ somewhat for other models.

**Table 3-6. BIOS Setup Menus and Parameters**

Omnibook XE4400: Introduced with BIOS version KD.M1.00 (Spring 2002).		
Main Menu	Description	Default
BIOS Revision	Shows the current BIOS version.	Detected automatically.
System Time	Sets the time using 24-hour format. Values set take effect immediately.	
System Date	Sets the date using dd/mm/yy format (except English, which uses mm/dd/yy format).	
Language	Sets the language for BIOS Setup.	Detected automatically.
Internal Hard Disk	Sets the hard disk drive type and various parameters.	Detected automatically.
Extended Memory	Shows the extended memory size.	Detected automatically.
CPU Serial Number	For a Pentium processor with a serial number, makes the serial number available to software.	Disabled.
Serial Number	Displays the serial number as shown on the back of the notebook.	Detected automatically.
PC ID	Displays the PC ID String stored in the reserved part of RAM.	

<b>Main Menu</b>	<b>Description</b>	<b>Default</b>
Service ID	Displays an identifier used for repair service.	Detected automatically.
UUID	Displays the value of the 16-byte UUID (Universally Unique ID) as 32 hex characters.	Detected automatically.
MAC Address	Displays the MAC network address of the internal (wired) LAN, if present.	Detected automatically.
<b>System Devices Menu</b>	<b>Description</b>	<b>Default</b>
Video Display Device	Sets whether the built-in display automatically switches to an external display, if one is detected.	Auto
External Pointing Devices	Disables the internal pointing devices when an external pointing device is connected.	Auto
Legacy USB Support	Enables BIOS support for USB mouse, keyboard, and floppy drive during startup.	Enabled
Wake On LAN from Power Off	Lets the notebook be turned on via the LAN port. If this option is enabled, the notebook uses increased power while it is shut down.	Disabled
<b>Security Menu</b>	<b>Description</b>	<b>Default</b>
User Password is	Shows if a user password is set.	Clear
Administrator Password is	Shows if an administrator password is set.	Clear
Set User Password	Press ENTER to set, change, or clear the user password. The password can have no more than 8 characters (0-9, A-Z), and cannot include special or accented characters.	Enter
Set Administrator Password	Press ENTER to set, change, or clear the administrator password, which protects BIOS Setup settings. The password can have no more than 8 characters (0-9, A-Z), and cannot include special or accented characters.	Enter
Password Required to Boot	Sets whether a user password is required when the computer boots. Requires the administrator password for changes.	Disabled
<b>Boot Menu</b>	<b>Description</b>	<b>Default</b>
Hard Disk Removable Device CD/DVD Built-in LAN	Shows the order of boot devices. Move the entries to change the order. Built-in LAN provides diskless boot from a network server.	1. Hard Disk 2. Removable Device 3. CD/DVD 4. Built-in LAN
<b>Exit Menu</b>	<b>Description</b>	
Save Changes and Exit	Saves Setup changes, and then exits and reboots.	
Discard Changes and Exit	Discards any Setup changes made since last save, and then exits and reboots. Does not affect password, date, or time changes.	
Get Default Values	Restores default settings, and remains in Setup. Does not affect password, date, or time changes.	

### Updating the Notebook's BIOS

Hewlett-Packard might from time to time provide updates to the notebook's BIOS. Use e-DiagTools for Windows to download and install these BIOS updates as needed (page 2-39).

## Replaceable Parts

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This chapter contains an exploded view of the Omnibook XE4400 and the following lists of parts:

- Notebook replaceable parts (page 4-3).
- Accessory replacement parts (page 4-5).
- Part number reference (page 4-5).

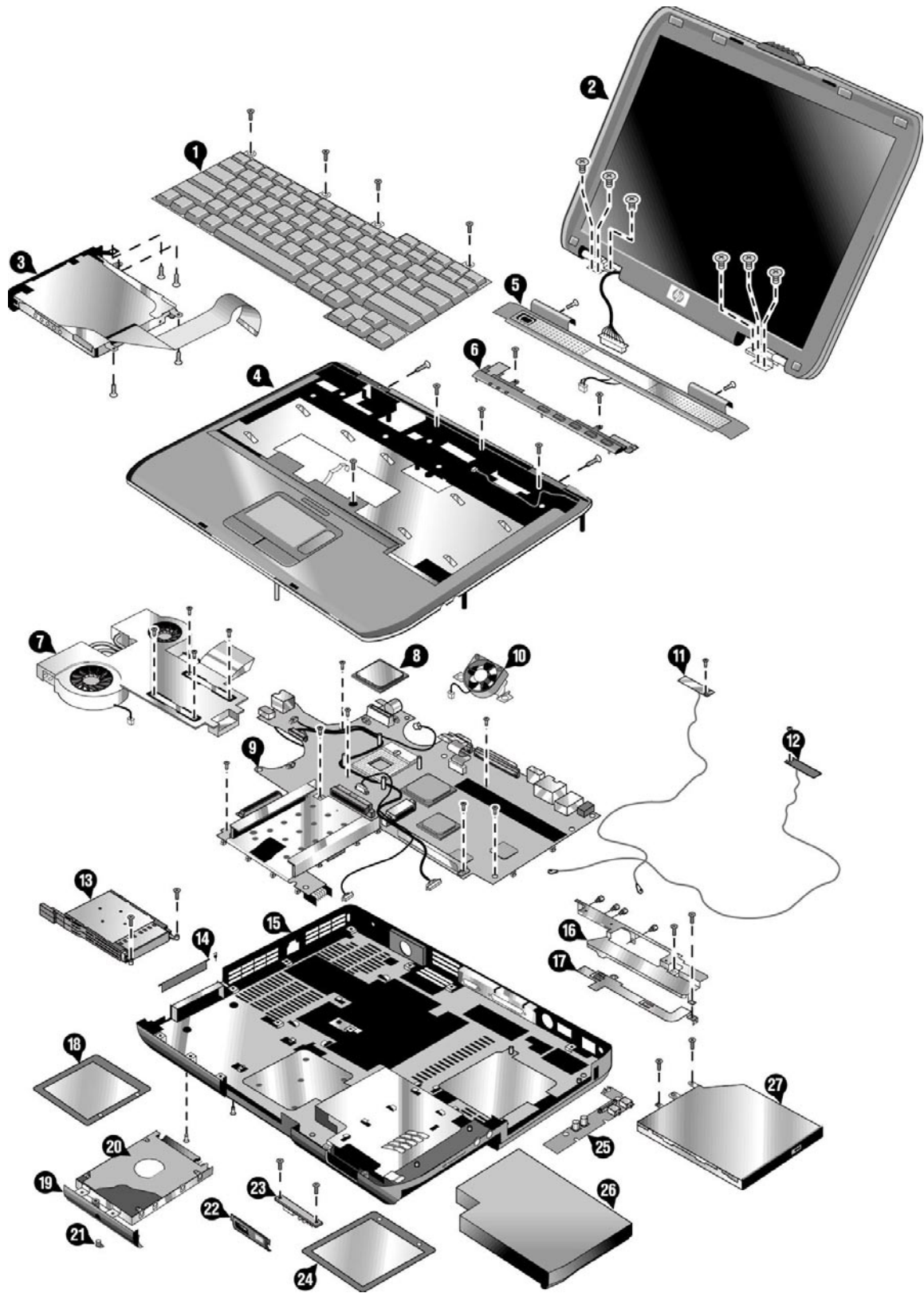


Figure 4-1. Exploded View

**Table 4-1. Omnibook Replaceable Parts**

	<b>Description</b>	<b>Part Number</b>	<b>Exchange Part Number</b>	<b>User-Repl.</b>
26	Battery, Li-Ion	F4809-60901		Yes
15	Case, Bottom (includes right PCA and left wireless antennas)	F4665-60919		
11	Antenna, Wireless, Left and Right (PCAs)	F4665-60937		
15	Case, Bottom (includes right PCA and left wireless antennas)	F4665-60920		
11	Antenna, Wireless, Left and Right (PCAs)	F4665-60937		
15	Case, Bottom (includes right PCA and left wireless antennas)	F4665-60921		
11	Antenna, Wireless, Left and Right (PCAs)	F4665-60937		
4	Case, Top Gray/Silver (includes touchpad, touchpad PCA, touchpad flex cable, lid switch, and lidswitch cable)	F4665-60906		
4	Case, Top Black/Silver (includes touchpad, touchpad PCA, touchpad flex cable, lid switch, and lidswitch cable)	F4665-60908		
6	Cover, Button Assembly	F4665-60904		
	Cover, Docking Port	F4640-60966		Yes
	Cover, Modem Port	F4640-60960		
2	Display Assembly, 14.1" XGA (Gray/Silver)	F4640-60938		
2	Display Assembly, 15" SGVA+ (Gray/Silver)	F4640-60940		
2	Display Assembly, 15" XGA (Gray/Silver)	F4640-60939		
2	Display Assembly, 14.1" XGA (Black/Silver)	F4640-60961		
2	Display Assembly, 15" SGVA+ (Black/Silver)	F4640-60963		
2	Display Assembly, 15" XGA (Black/Silver)	F4640-60962		
18	Door, Memory	F4665-60901		Yes
24	Door, Mini-PCI	F4665-60902		Yes
27	Drive, CD-ROM	F4640-60934		Yes
27	Drive, Combo, CD-RW/DVD	F4640-60937		Yes
27	Drive, DVD	F4640-60936		Yes
3	Drive, FDD (includes FDD, FDD bezel, and flex cable)	F46665-60905		
20	Drive, Hard Disk			Yes
10	Fan, Small	F4665-60911		
17	Guide, OOD	F4665-60918		
7	Heatsink Assembly (includes heatsink, fans, and fan cables)	F4665-60910		
1	Keyboard, Arab/English	F4640-60909		Yes
1	Keyboard, Belgium	F4640-60910		Yes
1	Keyboard, Czech/English	F4640-60911		Yes
1	Keyboard, Danish	F4640-60912		Yes
1	Keyboard, French/Canada	F4640-60914		Yes
1	Keyboard, French	F4640-60913		Yes
1	Keyboard, German	F4640-60915		Yes
1	Keyboard, Greek	F4640-60916		Yes
1	Keyboard, Hebrew	F4640-60917		Yes
1	Keyboard, Hungary	F4640-60918		Yes
1	Keyboard, Iceland	F4640-60919		Yes
1	Keyboard, International English	F4640-60920		Yes

	Description	Part Number	Exchange Part Number	User-Repl.
1	Keyboard, Italy	F4640-60921		Yes
1	Keyboard, Japan	F4640-60922		Yes
1	Keyboard, Norway	F4640-60923		Yes
1	Keyboard, Portugese	F4640-60924		Yes
1	Keyboard, Russian	F4640-60925		Yes
1	Keyboard, Spanish	F4640-60926		Yes
1	Keyboard, Sweden/Finnish	F4640-60927		Yes
1	Keyboard, Swiss	F4640-60928		Yes
1	Keyboard, Traditional Chinese	F4640-60929		Yes
1	Keyboard, Turkish	F4640-60930		Yes
1	Keyboard, United Kingdom	F4640-60931		Yes
1	Keyboard, US, English	F4640-60932		Yes
5	Keyboard Cover/Speaker Assembly	F4665-60903		Yes
5	Keyboard Cover/Speaker Assembly (Black)	F4665-60928		Yes
	Kit, Cable (includes, audio control, IR, switchboard, FDD, button panel, and speaker)	F4665-60936		
	Kit, Display Screw Plug, Gray Rubber Display Screw Plugs (6), Mylar Display Screw Plugs (4)	F4640-60970		Yes
14	Kit, Door, PCMCIA Upper Door w/ Spring Lower Door w/ Spring	F4640-60965		
	Kit, Rubber Foot and Screw Plug Rubber Feet (6) Rubber Front Screw Plugs (8)	F4640-60969		Yes
19	Kit, Screw	F4640-60975		
8	Module, CPU (DT)			
22	Panel, Wireless w/ IR, w/ button	F4640-60950		
25	PCA, Audio Control	F4665-60923		
23	PCA, I/R	F4665-60924		
9	PCA, Motherboard, Pentium DT (includes HDD guide, lower OOD guide, and modem/audio PCA, does not include CPU) PCA, Modem/Audio	F4665-60916 F4665-60927		
9	PCA, Motherboard, Pentium DT (includes HDD guide, lower OOD guide, and modem/audio PCA, does not include CPU) PCA, Modem/Audio	F4665-60917 F4665-60927		
16	Shield, ESD	F4665-60913		
13	Socket, PCMCIA	F4665-60912		
19	Tray, HDD (includes HDD frame, interface connector, four mounting screws, plastic door)	F4640-60904		Yes



**Table 4-2. Accessory Replaceable Parts**

Description	Part Number	Exchange Part Number	User Repl.
128-MB SDRAM module (DDR266)			Yes
256-MB SDRAM module (DDR266)			Yes
512-MB SDRAM module (DDR266)			Yes
90-watt AC adapter			Yes
8-cell Lithium-ion battery			Yes
Adapter, PS/2 Y	F1469-80001		Yes
Cord, power (Australia)	8120-6312		Yes
Cord, power (U.S., Canada, Taiwan)	8120-6313		Yes
Cord, power (Europe)	8120-6314		Yes
Cord, power (Japan)	8120-6316		Yes
Cord, power (India)	8120-0702		Yes
Cord, power (South Africa)	8120-6317		Yes
Cord, power (Argentina)	8120-8367		Yes
Cord, power (People's Rep. Of China)	8120-8373		Yes
Cord, power (S. Korea)	8120-8441		Yes
Cord, power (Chile)	8120-8452		Yes
Cord, power (Hong Kong, Singapore)	8120-8699		Yes
Drive, 40-GB hard disk			Yes
Port replicator			Yes

**Table 4-3. Part Number Reference**

Part Number	Exchange Part Number	Description	User-Repl.
		128-MB SDRAM module (DDR266)	Yes
		256-MB SDRAM module (DDR266)	Yes
		512-MB SDRAM module (DDR266)	Yes
		20-GB hard disk drive module	Yes
		30-GB hard disk drive module	Yes
		40-GB hard disk drive module	Yes
		90-watt AC adapter	Yes
F1469-80001		Adapter, PS/2 Y	Yes
F4665-60937		Antenna, Wireless, Left and Right (PCAs)	
F4809-60901		Battery, Li-Ion	Yes
F4665-60919		Bottom Case	
F4665-60920		Bottom Case	
F4665-60921		Bottom Case	
F4665-60906		Case, Top	
F4665-60908		Case, Top	
8120-6312		Cord, power (Australia)	Yes
8120-6313		Cord, power (U.S., Canada, Taiwan)	Yes
8120-6314		Cord, power (Europe)	Yes
8120-6316		Cord, power (Japan)	Yes
8120-0702		Cord, power (India)	Yes
8120-6317		Cord, power (South Africa)	Yes
8120-8367		Cord, power (Argentina)	Yes

Part Number	Exchange Part Number	Description	User-Repl.
8120-8373		Cord, power (People's Rep. Of China)	Yes
8120-8441		Cord, power (S. Korea)	Yes
8120-8452		Cord, power (Chile)	Yes
8120-8699		Cord, power (Hong Kong, Singapore)	Yes
F4665-60904		Cover, Button Assembly	Yes
F4640-60966		Cover, Docking Port	Yes
F4640-60960		Cover, Modem Port	
F4640-60938		Display Assembly, 14.1" XGA (Gray/Silver)	
F4640-60940		Display Assembly, 15" SGVA+ (Gray/Silver)	
F4640-60939		Display Assembly, 15" XGA (Gray/Silver)	
F4665-60961		Display Assembly, 14.1" XGA (Gray/Silver)	
F4665-60963		Display Assembly, 15" SGVA+ (Gray/Silver)	
F4665-60962		Display Assembly, 15" XGA (Black/Silver)	
F4665-60901		Door, Memory	Yes
F4665-60902		Door, Mini-PCI	Yes
F4640-60934		Drive, CD-ROM	Yes
F4640-60937		Drive, Combo, CD-RW/DVD	Yes
F4640-60936		Drive, DVD	Yes
F4665-60905		Drive, FDD (includes FDD, FDD bezel, and flex cable)	
		Drive, Hard Disk	Yes
F4665-60911		Fan, Small	
F4665-60918		Guide, OOD	
F4665-60910		Heatsink Assembly	
F4640-60909		Keyboard, Arab/English	Yes
F4640-60910		Keyboard, Belgium	Yes
F4640-60911		Keyboard, Czech/US	Yes
F4640-60912		Keyboard, Danish	Yes
F4640-60914		Keyboard, French/Canada	Yes
F4640-60913		Keyboard, French	Yes
F4640-60915		Keyboard, German	Yes
F4640-60916		Keyboard, Greek	Yes
F4640-60917		Keyboard, Hebrew	Yes
F4640-60918		Keyboard, Hungary	Yes
F4640-60919		Keyboard, Iceland	Yes
F4640-60920		Keyboard, International English	Yes
F4640-60921		Keyboard, Italy	Yes
F4640-60922		Keyboard, Japan	Yes
F4640-60923		Keyboard, Norway	Yes
F4640-60924		Keyboard, Portugese	Yes
F4640-60925		Keyboard, Russian	Yes
F4640-60926		Keyboard, Spanish	Yes
F4640-60927		Keyboard, Sweden/Finnish	Yes
F4640-60928		Keyboard, Swiss	Yes
F4640-60929		Keyboard, Traditional Chinese	Yes
F4640-60930		Keyboard, Turkish	Yes
F4640-60931		Keyboard, United Kingdom	Yes
F4640-60932		Keyboard, US, English	Yes
F4665-60903		Keyboard Cover/Speaker Assembly	Yes

<b>Part Number</b>	<b>Exchange Part Number</b>	<b>Description</b>	<b>User-Repl.</b>
F4665-60928		Keyboard Cover/Speaker Assembly (Black)	Yes
F4640-60970		Kit, Display Screw Cover	Yes
F4640-60965		Kit, Door, PCMCIA	
F4640-60969		Kit, Rubber Foot and Screw Plug	Yes
		Kit, Screw	
		Module, CPU (Pentium 4-M)	
F4640-60950		Panel, Wireless w/ IR, w/ button	
F4665-60923		PCA, Audio Control	
F4640-60946		PCA, I/R	
F4665-60916		PCA, Motherboard, Pentium DT	
F4640-60917		PCA, Motherboard, Pentium DT	
F4665-60927		PCA, Modem/Audio	
F4640-60905		Port Replicator	
F4665-60913		Shield, ESD	
F4665-60904		Socket, PCMCIA	
F4640-60904		Tray, HDD	



## Reference Information

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This chapter includes the following reference information:

- Password removal policy.
- Display quality statement.

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### Password Removal Policy

If the user forgets the system password, the user calls Technical Support to determine the proper removal procedure. The user must provide proof of ownership, and the notebook must be operated during the procedure.

The password removal procedure is protected as HP Company Private information. There are a restricted number of locations that can perform password removal. It might not be disclosed or distributed outside those locations.

Password removal is strictly controlled. Hewlett-Packard and authorized support providers must ensure with written evidence that the notebook being “cleansed” is actually in the possession of the notebook’s actual and current owner. This requires a sales receipt showing the notebook serial number and owner’s name, or a written statement from the owner attesting that he or she is the owner of the notebook. The statement can be a fax copy of the document. The fact that the notebook is in the hands of an HP representative on behalf of the customer is not evidence of ownership. In addition, HP will not remove the password of a notebook for any non-owner, even if it is requested by law enforcement agencies. If you receive such a request, you should notify management and HP Corporate Legal immediately. (These requests might require a court order prior to our participation.)

Further, the entity removing the password must log the name, serial number and date of the removal, and file the written backup with the log. The log and backup are subject to standard record retention process and review.

The final issue relating to removal of passwords is that HP cannot provide information to users that would assist them in improperly removing a password and opening a notebook.

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# Hewlett-Packard Display Quality Statement

TFT display manufacturing is a highly precise but imperfect technology, and manufacturers cannot produce large displays that are cosmetically perfect. Most, if not all, TFT displays exhibit some level of cosmetic imperfection. These cosmetic imperfections might be visible to the customer under varying display conditions, and can appear as bright, dim, or dark spots. *This issue is common across all vendors supplying TFT displays in their products and is not specific to the HP Omnibook display.*

HP Omnibook TFT displays meet or exceed all HP standards for cosmetic quality of TFT displays. HP does not warrant that the displays will be free of cosmetic imperfections. *TFT displays can have a small number of cosmetic imperfections and still conform to HP's cosmetic quality specifications.*

Here are some guidelines for determining what action to take on customers' complaints of cosmetic imperfections in their TFT displays:

1. View the notebook under the customer's normal operating conditions.

This means that if the customer uses the unit predominately in DOS, in Windows, or in some other application or combination of applications, you should make the determination under those same applications. Self test is not a normal operating condition and is not a sufficient tool for interpreting display quality.

2. Use the table below to determine whether the display should be considered for replacement. These are the only conditions in this guideline that might call for a replacement due to a defect in material or workmanship based on the HP Limited Warranty Statement.

3. If a display is considered for replacement, make sure the customer understands that cosmetic variations might also exist on the replacement display, and might require the customer to use a work-around to obscure the cosmetic imperfection.

4. Customers with cosmetic-based complaints that do not conform to the above conditions and tests will not normally be considered for display replacement. The HP-responsible person working with the customer should identify work-arounds that are reasonable and appropriate for the individual customer. Customers who must have a more perfect display solution should consider switching to an Omnibook with a DSTN display.

We expect that over time the industry will continue to produce displays with fewer inherent cosmetic imperfections, and we will adjust our HP guidelines as these improvements are implemented.

**Table 5-1. Omnibook XE4400 LCD Guidelines**

Type of Imperfection	Imperfections Not Allowed
<b>Electrical Imperfections:</b> Bright dots (a) Dark dots (a)	<ul style="list-style-type: none"> <li>• 7 or more single bright dots.</li> <li>• 7 or more single dark dots.</li> <li>• 9 or more total (bright and dark combined) defective dots.</li> <li>• Any occurrence of multiple defective dots within 15 mm.</li> </ul>
<b>Mechanical Imperfections:</b> Discoloration Polarizer bubbles, dents (b)	<ul style="list-style-type: none"> <li>• Any polarizer bubble, discoloration, or dent that is visible from at least 36 cm (14 in).</li> </ul>
Definitions of imperfections: a Bright or dark dot: a subpixel (red, green, or blue dot) that is stuck on or off. b Polarizer dent or bubble: a light spot with a darker border that appears on a lighted display and does not change size. (In contrast, a polarizer scratch is a light line that is visible on a darker background and does not change size.)	

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## **Service Notes and Obsolete Parts**

Service notes containing important repair information for these products will be issued as needed. These notes are available online at the Partnership web site—see page vii.





**Part Number**  
**F4665-90024**

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