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# HP Omnibook XE3

(AMD CPU Version: Technology Codes GE and GD)



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## Service Manual

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## Introduction

This manual provides reference information for servicing HP Omnibook XE3 notebook PCs. It is for use by HP-authorized service personnel while installing, servicing, and repairing these products.

The manual is designed as a self-paced guide that will train you to install, configure, and repair XE3 notebooks. The manual is self-contained, so you can follow it without having equipment available.

The following table lists other sources of information about the notebook 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> (European mirror: <a href="http://www.europe.hp.com/notebooks">http://www.europe.hp.com/notebooks</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	(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 Omnibook XE3 series is HP's value all-in-one business notebook computer, targeted at small- to medium-sized businesses (SMBs). It combines affordability, value, ease-of-use, and quality in a convenient package that integrates easily into any SMB environment at a wide range of prices. It also incorporates several new technologies and an enhanced industrial design for greater ease-of-use, quality, and reliability.

The products described in this service manual may have either of two technology codes—GE or GD—as listed in the following table. These codes determine the service parts needed for that model—see “Technology Codes” on page 1-2.

**Table 1-1. Omnibook XE3 Series Models**

Product	CPU	Display/color	Hard Drive	Standard SDRAM	CD/DVD drive <sup>1</sup>	Multimedia buttons/status panel	LAN	Battery <sup>2</sup>	OS <sup>3</sup>	Tech. Code
F2407M	Athlon 1 GHz	15.0" XGA/silver	20 GB	256 MB	Combo	Yes	Y	9 Li-Ion	ME	GD
F2409	Duron 800 MHz	13.3-in XGA/blue	10 GB	128 MB	CD (24X)	No <sup>5</sup>	N	NiMh	W98	GD
F2410	Athlon 1 GHz	13.3-in XGA/blue	10 GB	128 MB	CD (24X)	No <sup>5</sup>	N	NiMh	W98	GD
F2411	Duron 800 MHz	13.3-in XGA/blue	10 GB	128 MB	CD (24X)	No <sup>5</sup>	N	NiMh	W98	GD
F2412	Duron 800 MHz	13.3-in XGA/blue	10 GB	128 MB	CD (24X)	No <sup>5</sup>	N	NiMh	W98	GD
F2418M	Duron 850 MHz	14.1-in XGA/silver	20 GB	128 MB	DVD (8X)	Yes	Y	6 Li-Ion	ME	GD
F2419M	Athlon 900 MHz	15.0-in XGA/silver	20 GB	256 MB	DVD (8X)	Yes	Y	9 Li-Ion	ME	GD
F2420M	Athlon 1 GHz	15.0-in XGA/silver	30 GB	256 MB	Combo	Yes	Y	9 Li-Ion	ME	GD
F3779	Duron 800 MHz	13.3-in XGA/cole gray	10 GB	128 MB	CD (24X)	No <sup>5</sup>	N	NiMh	W98	GD
F3780	Athlon 900 MHz	14.1-in XGA/cole gray	20 GB	128 MB	DVD (8X)	Yes	Y	9 Li-Ion	W98	GD
F3781	Athlon 900 MHz	14.1-in XGA/cole gray	20 GB	128 MB	Combo	Yes	Y	9 Li-Ion	W98	GD
F3783M	Duron 850 MHz	14.1-in XGA/silver	20 GB	256 MB	DVD (8X)	Yes	Y	6 Li-Ion	ME/works	GD
F3784M	Duron 850 MHz	14.1-in XGA/silver	20 GB	256 MB	Combo	Yes	Y	6 Li-Ion	ME/works	GD
F3865M	Duron 850 MHz	14.1-in XGA/silver	20 GB	128 MB	DVD (8X)	Yes	Y	6 Li-Ion	ME/works	GD
F3886HT	Duron 900 MHz	14.1-in XGA/silver	20 GB	256 MB	Combo	Yes	Y	9 Li-Ion	XP Home	GE
F3924H	Athlon 900 MHz	14.1-in XGA/silver	20 GB	256 MB	Combo	Yes	Y	9 Li-Ion	XP Home	GE
F3927H	Athlon 1 GHz	15.0-in XGA/silver	30 GB	256 MB	Combo	Yes	Y	9 Li-Ion	XP Home	GE
F3928H	Athlon 950 MHz	14.1-in XGA/silver	20 GB	2x128 MB <sup>4</sup>	DVD (8X)	Yes	Y	9 Li-Ion	XP Home	GE
F3929H	Athlon 1 GHz	15.0-in XGA/silver	20 GB	2x256 MB	Combo	Yes	Y	9 Li-Ion	XP Home	GE
F3930H	Athlon 1.1 GHz	15.0-in SXGA+/silver	30 GB	2x256 MB	Combo	Yes	Y	9 Li-Ion	XP Home	GE
F3931H	Duron 900 MHz	14.1-in XGA/silver	10 GB	256 MB	DVD (8X)	No <sup>5</sup>	Y	9 Li-Ion	XP Home	GE
F3933H	Athlon 950 MHz	14.1-in XGA/silver	20 GB	2x128 MB <sup>4</sup>	Combo	Yes	Y	9 Li-Ion	XP Home	GE
F3978AV	BTCO	BTCO	BTCO	BTCO	BTCO	Yes	Y	BTCO	XP Home	GE
F3980AV	BTCO	BTCO	BTCO	BTCO	BTCO	No <sup>5</sup>	Y	BTCO	XP Home	GE

Product	CPU	Display/color	Hard Drive	Standard SDRAM	CD/DVD drive <sup>1</sup>	Multimedia buttons/status panel	LAN	Battery <sup>2</sup>	OS <sup>3</sup>	Tech. Code
F4307H	Duron 900 MHz	14.1-in XGA/silver	20 GB	128 MB	Combo	Yes	Y	NiMH	XP Home	GE
F4308H	Athlon 900 MHz	14.1-in XGA/silver	20 GB	256 MB	Combo	Yes	Y	NiMH	XP Home	GE
F4309H	Athlon 1 GHz	15.0-in SXGA+/silver	30 GB	256 MB	Combo	Yes	Y	9 Li-Ion	XP Home	GE

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

All models include 56K modem.

LAN supports Ethernet 10Base-T (10 Mbps) and 100Base-T (100 Mbps).

BTCO = Built to Customer Order.

<sup>1</sup> Combo optical drive = DVD + CD-RW.

<sup>2</sup> Battery = 6- or 9-cell Li-Ion or NiMH.

<sup>3</sup> OS = Windows XP Home Edition, Windows ME, or Windows 98.

<sup>4</sup> Two 128-MB modules instead of one 256-MB module.

<sup>5</sup> "Defeatured" SKUs have no multimedia player buttons or LCD status panel.

## Technology Codes

HP does not change the name of a product every time the product's technology changes. While this helps ensure continuing market momentum for HP products, it complicates technology deployment and support processes.

To help solve this problem, HP has added a technology code to the serial number of each of its products. Since the BIOS must be matched to the notebook's hardware, the same code is used for the BIOS and the hardware. This manual refers to technology code deferences where applicable.

The table below shows the technology codes and the changes they signify for the products. Before downloading software or drivers or performing repairs, note the technology code for the HP notebook model.

Note that the first two characters of the BIOS ID (for example, **GE.M1.02**) indicate the hardware technology. You can also determine the BIOS ID using the BIOS Setup utility, or by pressing Esc during the boot process when the HP logo appears.

This manual contains service information for products having the following technology codes.

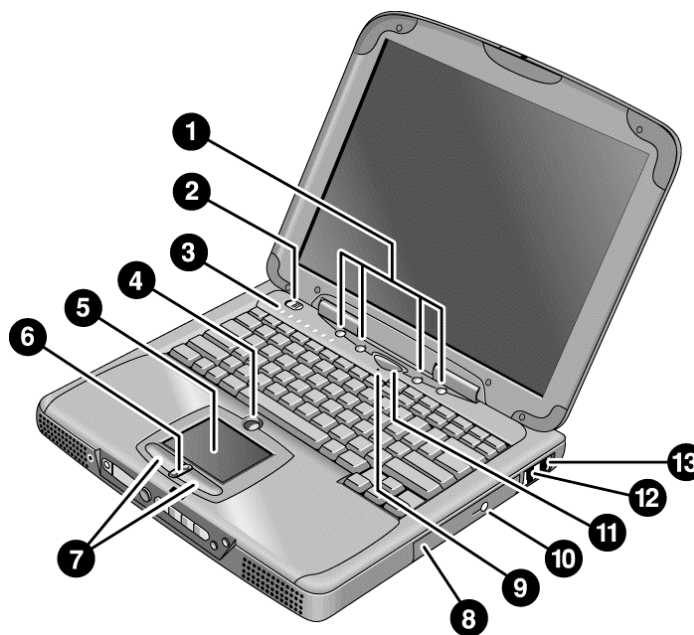
Technology code	Product name	Details
GD	Omnibook XE3 Pavilion N5XXX series (X is any number 0-9)	AMD Celeron and Athlon processors, Windows ME, 2000, or 98 operating system.
GE	Omnibook XE3 Pavilion N5XXX series (X is any number 0-9)	AMD Celeron and Athlon processors, Windows XP operating system, cosmetic change (new lighter blue color on all plastics).



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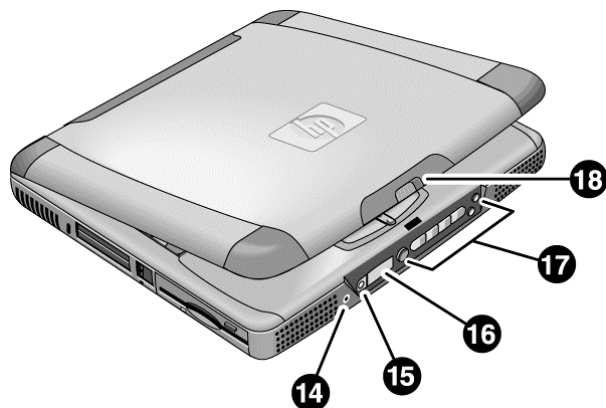
## Features

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



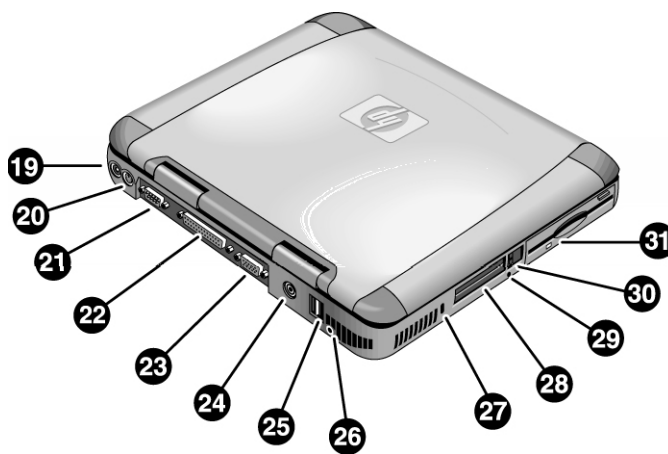
**Figure 1-1. Top/Right View**

- |  |                                 |
|--|---------------------------------|
| 1. One-Touch buttons (four).   | 7. Click buttons.               |
| 2. Power switch and status light.  | 8. CD/DVD drive.                |
| 3. Status lights (left to right: battery status, caps lock, num lock, scroll lock, floppy drive access, hard drive access, CD/DVD drive access). (See page 1-7.) | 9. Built-in microphone.         |
| 4. Pad Lock touch pad on/off button.   | 10. CD/DVD eject button.        |
| 5. Touch pad (pointing device).  | 11. Standby button (blue).      |
| 6. Scroll up/down toggle.  | 12. Modem port.                 |
|  | 13. LAN port (selected models). |



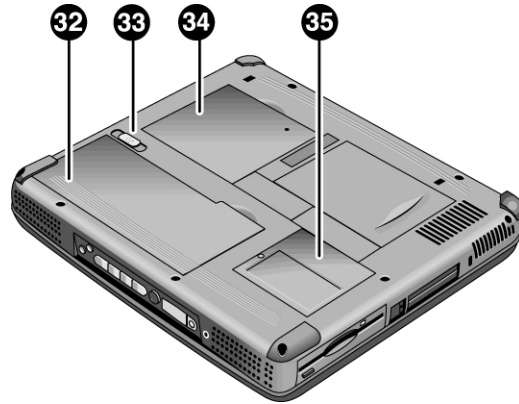
**Figure 1-2. Front View**

- |  |   |
|--|---|
| 14. Headphone jack.                                    | 17. Multimedia buttons (selected models). |
| 15. Status panel mode select button (selected models). | 18. Latch.                                |
| 16. Status panel (selected models).                    |   |



**Figure 1-3. Rear/Left View**

- |   |   |
|---|---|
| 19. AC adapter jack.                        | 26. Microphone jack.                            |
| 20. PS/2 port (external mouse or keyboard). | 27. Kensington lock slot (security connector).  |
| 21. Serial port.                            | 28. PC card slots (upper and lower).            |
| 22. Parallel port.                          | 29. System-off switch (for resetting notebook). |
| 23. VGA port (external monitor).            | 30. PC card eject buttons.                      |
| 24. TV output port.                         | 31. Floppy disk drive.                          |
| 25. Two USB ports.                          |   |



**Figure 1-4. Bottom View**

32. Battery.

33. Battery latch.

34. SDRAM cover.

35. Mini-PCI cover.

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# Operation

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

## Turning the Notebook On and Off

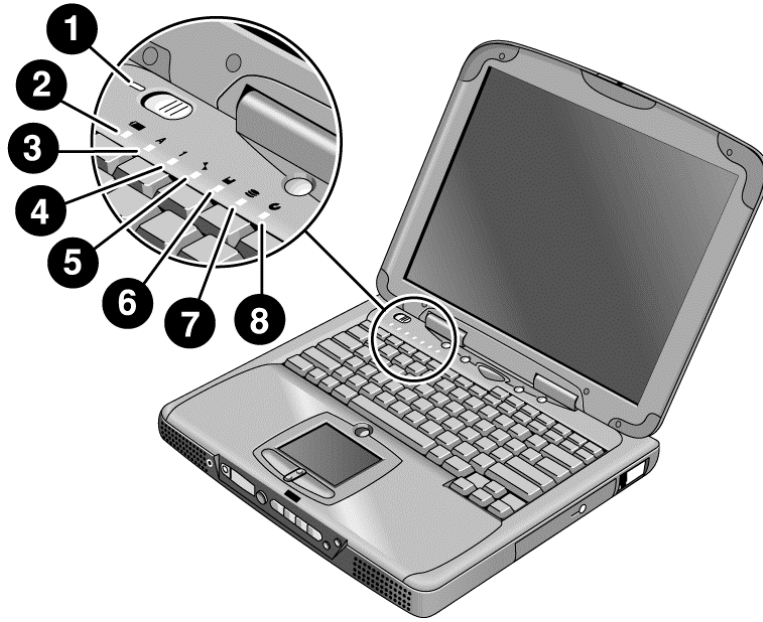
You can start and stop the notebook using its power switch or blue standby button. However, at times you may want to use certain methods to start or stop the notebook—depending on power considerations, types of active connections, and start-up time.

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

Power mode	To enter this mode	To turn on again
<b>Display-off mode</b> Power status LED stays green. Saves minimal power. Turns off the display and hard disk. Restarts quickly. Maintains network connections.	Allow timeout.	Press any key or move a pointing device to restore the display ("Instant On").
<b>Standby mode</b> Power status LED turns amber. Saves significant power. Turns off the display, hard drive, and other components. Maintains the current session in SDRAM. Restarts quickly. Restores network connections.	Press the blue standby button. –or– Click Start, Turn Off Computer, Stand By. –or– Click Start, Shutdown, Standby. –or– Allow timeout (Windows 98 only).	Press the blue standby button to return to your current session ("Instant-On").
<b>Hibernate mode</b> Power status LED turns off. Saves maximum power. Saves the current session to disk, then turns off. Restores network connections.	Click Start, Turn Off Computer, then press and hold Shift and click Hibernate. –or– Click Start, Shut Down, Hibernate. –or– Allow timeout (Windows 98 only).	Press the blue standby button to recover your previous session.
<b>Turn off</b> Power status LED turns off. Saves maximum power. Turns off without saving the current session. At startup, resets everything, starts a new session, and restores network connections with mini-PCI and some PCMCIA cards.	Click Start, Turn Off Computer, Turn Off. –or– Click Start, Shut Down, Shut down (recommended). –or– Slide the power switch and hold for five seconds (only if the Start menu procedure doesn't work).	Press the blue standby button to restart with a new session.

## Checking the Notebook's Status






The notebook's status lights—located above the keyboard—report power and battery status, keyboard status, and drive activity.



**Figure 1-5. Status Lights**

- |                    |                                |
|--------------------|--------------------------------|
| 1. Power status.   | 5. Scroll lock.                |
| 2. Battery status. | 6. Floppy disk drive activity. |
| 3. Caps lock.      | 7. Hard disk drive activity.   |
| 4. Num lock.       | 8. CD/DVD drive activity.      |

**Table 1-3. Status Lights**


Indicator	Meaning
LED next to power switch	<b>Power status</b> Green: the notebook is on. Amber: the notebook is in standby mode. No light: the notebook is off or in hibernate mode.
	<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. Red: the AC adapter is connected and the battery has a fault. Off: the AC adapter is not connected, or the adapter is connected but the battery is missing.
<b>A</b>	<b>Caps Lock</b> Caps Lock is active.
<b>1</b>	<b>Num Lock</b> Num Lock is active. (The Keypad Lock must also be on to use the embedded keypad.)
	<b>Scroll Lock</b> Scroll Lock is active.
	<b>Floppy disk drive activity</b> Green: the notebook is accessing the floppy disk drive.
	<b>Hard disk drive activity</b> Green: the notebook is accessing the hard disk drive.
	<b>CD/DVD drive activity</b> Green: the notebook is accessing the CD/DVD drive.

In addition, the status panel on the front of the notebook (if present) provides CD playback status and other system information. For details, see the section “Status panel” in the notebook’s *Reference Guide*.

## 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.

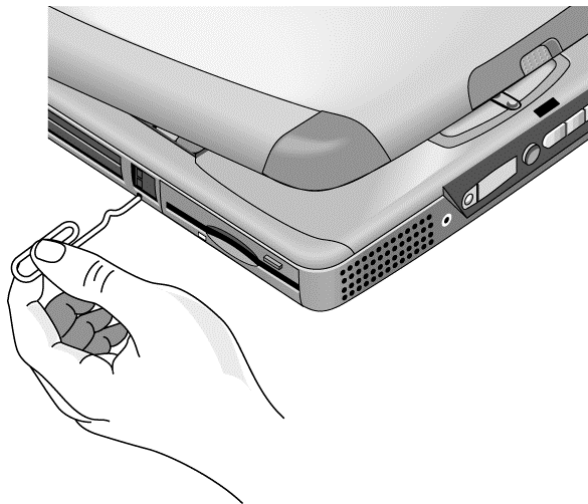
**Table 1-4. Fn Hot Keys**

Hot Key	Effect
Fn+F1	Decreases the display brightness (TFT screens only).
Fn+F2	Increases the display brightness (TFT screens only).
Fn+F3	Decreases the display brightness (HPA screens only).
Fn+F4	Increases the display brightness (HPA screens only).
Fn+F5	Toggles among the built-in display, an external display, and simultaneous display on both.
Fn+F7	Mutes the notebook's speakers.
Fn+F8	Toggles the built-in numeric keypad on and off. Does not affect an external keyboard. If Num Lock is on, the numeric functions are active; otherwise, cursor control is active.
Fn+Lock key*	Toggles Scroll Lock on and off.
Fn+Up arrow	Increases sound volume.
Fn+Down arrow	Decreases sound volume.
*The Lock key is in the top row of the keyboard: 	

## Resetting the Notebook

Occasionally, Windows or the notebook may stop responding, so that you cannot turn the notebook off. If this happens, try the following in the order listed:

- If possible, turn off the notebook from Windows: click Start, Turn Off Computer, Turn Off.
- Press Ctrl+Alt+Del, then click Shut Down.
- Slide and hold the power switch for about five seconds, until the notebook turns off.
- Insert a straightened paper clip into the system-off switch on the left side of the notebook (beneath the PC card eject buttons).



**Figure 1-6. Resetting the Notebook**

Once the notebook is off, press the blue standby button to restart.

### **Note**

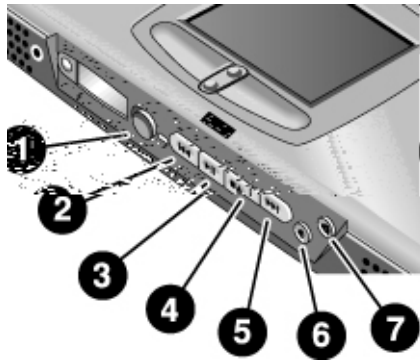
To boot from a CD or DVD, insert a bootable CD (such as a *Recovery CD*) into the drive, then restart. Press Esc when the HP logo appears, then select the CD-ROM/DVD drive as the temporary boot device.



## Using the CD/DVD Player (selected models)

The multimedia buttons on the front of the notebook control the CD/DVD player, and work in much the same way as do the controls of a standalone CD or DVD player. The player operates whether the notebook is on, off, or in standby or hibernate mode. (When the notebook is on, the volume control buttons also govern the volume for most other audio applications.)

If the notebook is off or in standby or hibernate mode, slide the multimedia power switch to the left to activate the player. For details about using the CD/DVD player, see the notebook's *Reference Guide*.



**Figure 1-7. Multimedia Buttons**

1. Multimedia power (use only when notebook is turned off or in standby or hibernate mode).
2. Previous track button.
3. Play/pause button.
4. Stop button (when notebook is on).  
Stop/eject (when notebook is off).
5. Next track button.
6. Volume control down button.
7. Volume control up button.

---

# 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) (in Europe: [www.europe.hp.com/notebooks](http://www.europe.hp.com/notebooks)).

## Hardware Specifications

**Table 1-5. XE3 Series Hardware Specifications**

<b>Physical Attributes</b>	<b>Size:</b> 13.03 x 10.72 x 1.59 in (331 x 272.3 x 40.5 mm) for 13.3/14.1-in models. 13.46 x 10.92 x 1.65 in (342 x 276.6 x 42.0 mm) for 15.0-in models. <b>Weight:</b> 7 lbs minimum.
<b>Processor</b>	<b>Technology code GD:</b> AMD Duron and Athlon, 200-MHz FSB. <b>Technology code GE:</b> AMD K7 Duron and Athlon, 200-MHz FSB.
<b>Chip Set</b>	Ali M1647 + M1535.
<b>SDRAM</b>	133-MHz (PC133) SDRAM. No SDRAM on board. Two 1.25-in slots for expansion up to 512 MB, using two 256-MB SODIMM modules (144 pin, 3.3 V).
<b>Mass Storage</b>	<b>Hard disk drive:</b> – 10, 20, or 30 GB, PCI Bus Master Enhanced IDE. – 9.5 mm, 2.5 in. – Technology code GD: Supports Ultra DMA33/66. – Technology code GE: Supports Ultra DMA33/66/100. <b>Floppy disk drive:</b> 1.44 MB, 12.7 mm, 3-mode module. <b>Optical drive:</b> 24x CD, 8x DVD, 24x8x CD-RW (or higher), 8x4x24x8 DVD-CDRW (Combo), 12.7 mm module.
<b>Display</b>	13.3/14.1/15.0-in XGA (1024x768) or 15.0-in SXGA+ (1400x1050) TFT LCD.
<b>Graphics Controller</b>	Trident CBXP + 8 MB video RAM.
<b>Power</b>	Rechargeable lithium-ion battery (11.1 V) or NiMH battery (10.8 V). Battery life: up to 3 hrs depending on settings, usage, battery, and other factors. Charging time: 2.2 hrs (system off), 3 hrs (system on). Low-battery warning. Suspend/resume capability. AC adapter (DC-in) jack. Universal AC adapter: 100–240 Vac (50/60 Hz) input, 19 Vdc output, 60–65 W.
<b>Keyboard and Pointing Devices</b>	87/88/90-key spill-proof QWERTY keyboard with 101/102 key emulation. Embedded numeric keypad, 12 function (Fn) keys. Touch pad with on/off button. Left and right click buttons, center scroll button. NS87570 keyboard controller.
<b>Audio System</b>	CD player with built-in control buttons and status display (selected models). Two stereo speakers. Built-in microphone. Microphone and headphone jacks.
<b>Audio</b>	ESS Allegro (1988). – Integrated AC'97 CODEC. – HSP modem interface via MC'97 link. – Supports wake up on Ring. Modem CODEC ESS 2828 on mini-PCI slot.

<b>Communications</b>	<p><b>LAN:</b></p> <ul style="list-style-type: none"> <li>– Transmission rate: 10 or 100 Mbps based on Auto-Negotiation.</li> <li>– Data standard: supports Category 3 (10Base-T/100Base-T) and Category 5 (100Base-TX) media coupler.</li> <li>– Power management: supports remote power-up using Wake on LAN from S3 (suspend) (WOL) technology and Deep power-down mode support.</li> </ul> <p><b>Modem:</b></p> <ul style="list-style-type: none"> <li>– Data modem standard: supports V.90, V.34, V.32bis, V.32, V.22bis, V.22, V.23, and V.21; Bell 212A and 103.</li> <li>– Error correction: V.42 LAPM, and MNP 2-4 error correction.</li> <li>– Data compression: V.42bis and MNP 5 data compression.</li> <li>– Fax modem standard: send/receive rates up to 14400 bps, V.17, V.29, V.27ter, and V.21 channel 2.</li> <li>– Power management: supports ACPI Power Management and wake up on Ring from S3.</li> </ul>
<b>Input/Output</b>	<p>Serial port: 9 pins (RS232), 16550 compatible.  High-speed bidirectional parallel port: 25 pins, EPP/ECP capability.  VGA port: 15 pins.  PS/2: 6 pins, for keyboard, keypad or PS/2 mouse (Y adapter compatible).  Microphone-in, headphone-out jacks.  Internal microphone.  Two USB ports.  Composite TV-out.  RJ-45 (LAN), RJ-11 (modem) jacks</p>
<b>Expandability</b>	<p>Two Type II or one Type III 16-/32-bit PCMCIA slots.</p>
<b>Options</b>	<p>64/128/256-MB PC133 SODIMM: 3.3 V, 144-pin, SDRAM.  Mini-PCI modem, supporting wake-up on Ring# from D3 (cold) with AC-in.  Mini-PCI modem/LAN combo, supporting wake-up on Ring# &amp; PME# from D3 (cold) with AC-in.</p>
<b>Environmental Limits</b>	<p>Operating temperature: 0 to 40 °C (32 to 104 °F).  Storage temperature: –20 to 65 °C (–4 to 149 °F).  Operating humidity: 20% (10% on some models) to 90% RH (5 to 35 °C).  Operating altitude: up to 3050 m (10,000 ft).  Storage altitude: up to 12,200 m (40,000 ft).</p>

**Table 1-6. XE3 Series Accessories**

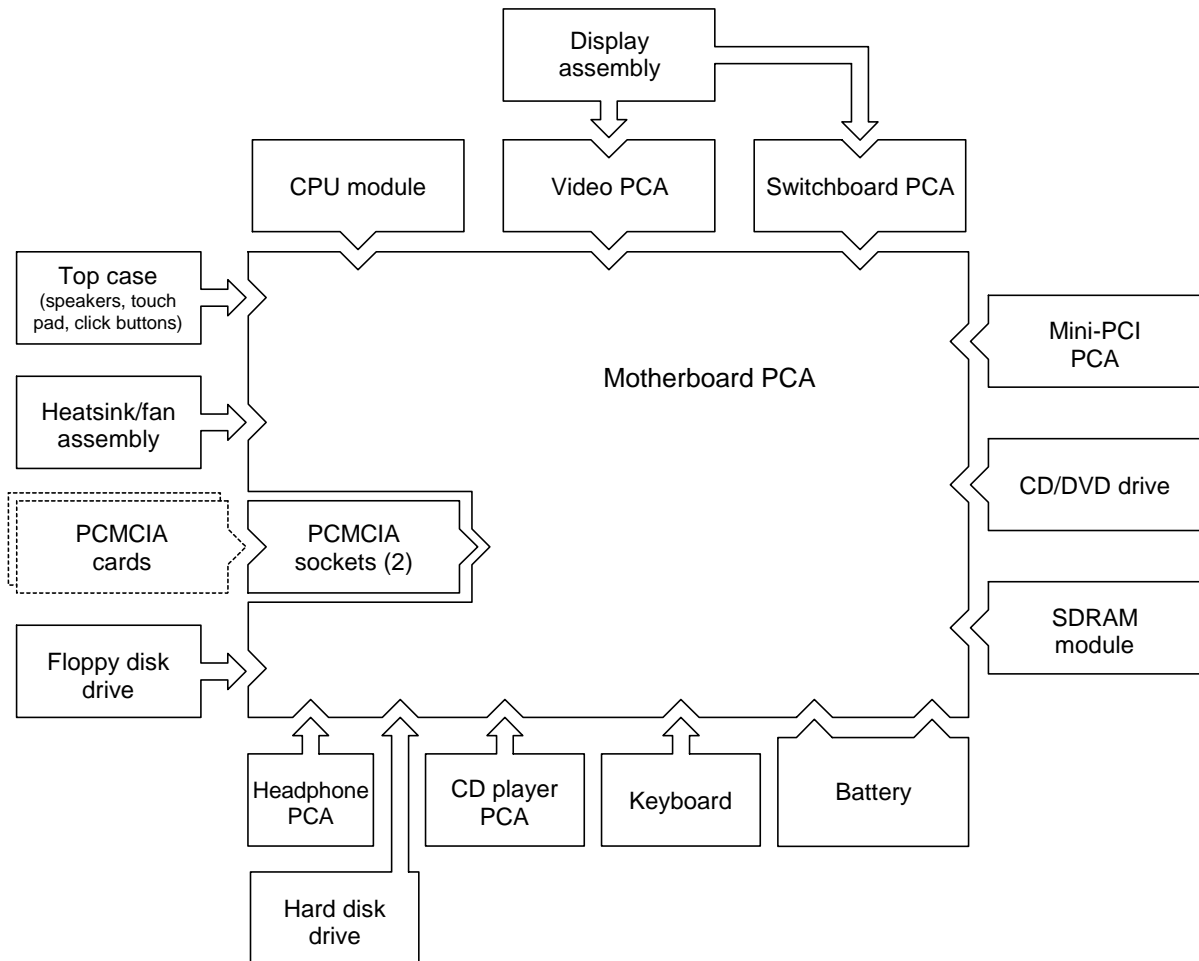
<b>Accessory</b>	<b>Description</b>
<b>Memory</b>	
F1457C	64-MB SDRAM PC133 SODIMM expansion module
F3495A	128-MB SDRAM PC133 SODIMM expansion module
F3496A	256-MB SDRAM PC133 SODIMM expansion module
<b>Power Options</b>	
F1455A	Auto/airline AC adapter (75-watt)
F1781A	Ultra Slimline AC adapter (60-watt)
F2024A/B	Li-Ion battery (9 cell)
F2297A	Car adapter (Europe only)
8120-6312	Replacement power cord, 250 Vac, 2.5 A (Australia/New Zealand)
8120-6313	Replacement power cord, 125 Vac, 3 A (U.S./Canada/Taiwan/Mexico/Philippines)
8120-6314	Replacement power cord, 250 Vac, 2.5 A (Europe/Egypt/Israel/Saudi Arabia)
8120-6316	Replacement power cord, 125 Vac, 3 A (Japan)
8120-6317	Replacement power cord, 250 Vac, 2.5 A (South Africa)
8120-8367	Replacement power cord, 250 Vac, 2.5 A (Argentina)
8120-8373	Replacement power cord, 250 Vac, 2.5 A (People's Republic of China)
8120-8452	Replacement power cord, 250 Vac, 2.5 A (Chile)
8120-8699	Replacement power cord, 250 Vac, 2.5 A (UK [EPSR] Hong Kong/Singapore)
8121-0702	Replacement power cord, 250 Vac, 2.5 A (India)
<b>Adapters</b>	
F1469A	PS/2 "Y" adapter
<b>PC Cards</b>	
F1625A	56-Kbps global modem v.90 PC card (for support only)
F1626A	10/100 LAN CardBus Ethernet PC card
F1627A	56-Kbps US-only modem PC card (for support only)
P1980A	USB Wireless LAN 802.11b PC card
P1981A	USB Wireless LAN access point PC card
F1985A	USB-NIC Ethernet adapter
F2135B/C	Wireless Comm access point PC card
F2136B	Wireless Comm PC card (128-bit)
F2196A	3Com Bluetooth PC card
<b>Security Accessories</b>	
F1645A	Kensington MicroSaver Notebook Security System
F1747A	Port Defcon 1 Notebook Security System
<b>Other</b>	
P1534A	HP amplified external speakers
P1977A	USB Compact Flash & IBM Microdrive reader
P1978A	USB web camera
F2100A	USB optical mouse

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## Internal Design

The motherboard PCA is the central component of the notebook's design, and 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. In addition, the table on page 1-16 lists the roles that the replaceable modules play in each of the notebook's functional subsystems.



**Figure 1-8. Replaceable Module Diagram**

**Table 1-7. Functional Structure**

<b>Function</b>	<b>Components Used</b>	<b>Component Roles</b>
<b>Bootup</b>	CPU module Motherboard Floppy disk module Hard disk drive	Main processor. Primary system circuitry. 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 PCA	No onboard RAM. Changeable RAM (2 slots). Video RAM.
<b>Power</b>	Battery Motherboard  Switchboard PCA AC adapter	Power storage. Power control circuitry, AC adapter socket, lid switch, system-off switch, power supply. Power switch, standby button. AC-to-DC converter.
<b>Display</b>	Motherboard Display assembly Video PCA	Video controller. Display output, backlight, power converter for backlight. Display drivers, LVDS processing, display/graphics controller, video RAM.
<b>Hard disk</b>	Motherboard Hard disk drive	Hard disk controller. Hard disk mechanism.
<b>Floppy drive</b>	Motherboard Floppy disk module	I/O controller, floppy connector. Floppy disk mechanism.
<b>Keyboard</b>	Motherboard Keyboard	Keyboard controller, keyboard BIOS. Key switches.
<b>Touch pad</b>	Motherboard Top case	Keyboard BIOS. Touch pad sensor, click buttons, controller (PS/2 output).
<b>Audio</b>	Motherboard  Switchboard PCA Headphone PCA Top case	Audio controller, audio decoder, speaker amplifier, external microphone jack. Microphone. Earphone amplifier. Speakers.
<b>Status</b>	Motherboard Switchboard PCA CD player PCA	LED circuitry, keyboard controller. Status LEDs. CD/DVD status display.
<b>Serial</b>	Motherboard	I/O controller, serial connector.
<b>Parallel</b>	Motherboard	I/O controller, parallel connector.
<b>PS/2 port</b>	Motherboard	Keyboard controller, PS/2 connector.
<b>USB</b>	Motherboard	Bus controller, USB connectors.
<b>PCMCIA</b>	Motherboard PCMCIA sockets	PCMCIA controller. PCMCIA connectors.

## Removal and Replacement

This chapter shows 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>• Battery (page 2-4).</li> <li>Carrier, hard disk drive (page 2-15).</li> <li>Case, bottom (page 2-35).</li> <li>Case, top (page 2-22).</li> <li>Cover, keyboard (page 2-10).</li> <li>• Cover, mini-PCI (page 2-9).</li> <li>• Cover, SDRAM (page 2-9).</li> <li>• Covers, screw (page 2-9).</li> <li>Display assembly (page 2-18).</li> <li>Doors, PCMCIA (page 2-38).</li> <li>Drive, CD/DVD (page 2-34).</li> <li>Drive, floppy disk (page 2-32).</li> <li>Drive, hard disk (page 2-14).</li> </ul>	<ul style="list-style-type: none"> <li>Heatsink assembly (with fan) (page 2-29).</li> <li>Keyboard (page 2-12).</li> <li>Module, CPU (page 2-30).</li> <li>• Module, SDRAM (page 2-5).</li> <li>PCA, CD player (page 2-24).</li> <li>PCA, headphone (page 2-41).</li> <li>• PCA, mini-PCI (page 2-7).</li> <li>PCA, motherboard (page 2-35).</li> <li>PCA, switchboard (page 2-41).</li> <li>PCA, video (page 2-27).</li> <li>Saddle, hinge set (page 2-25).</li> <li>Socket, PCMCIA (page 2-41).</li> </ul>
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### Caution

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



### Notes

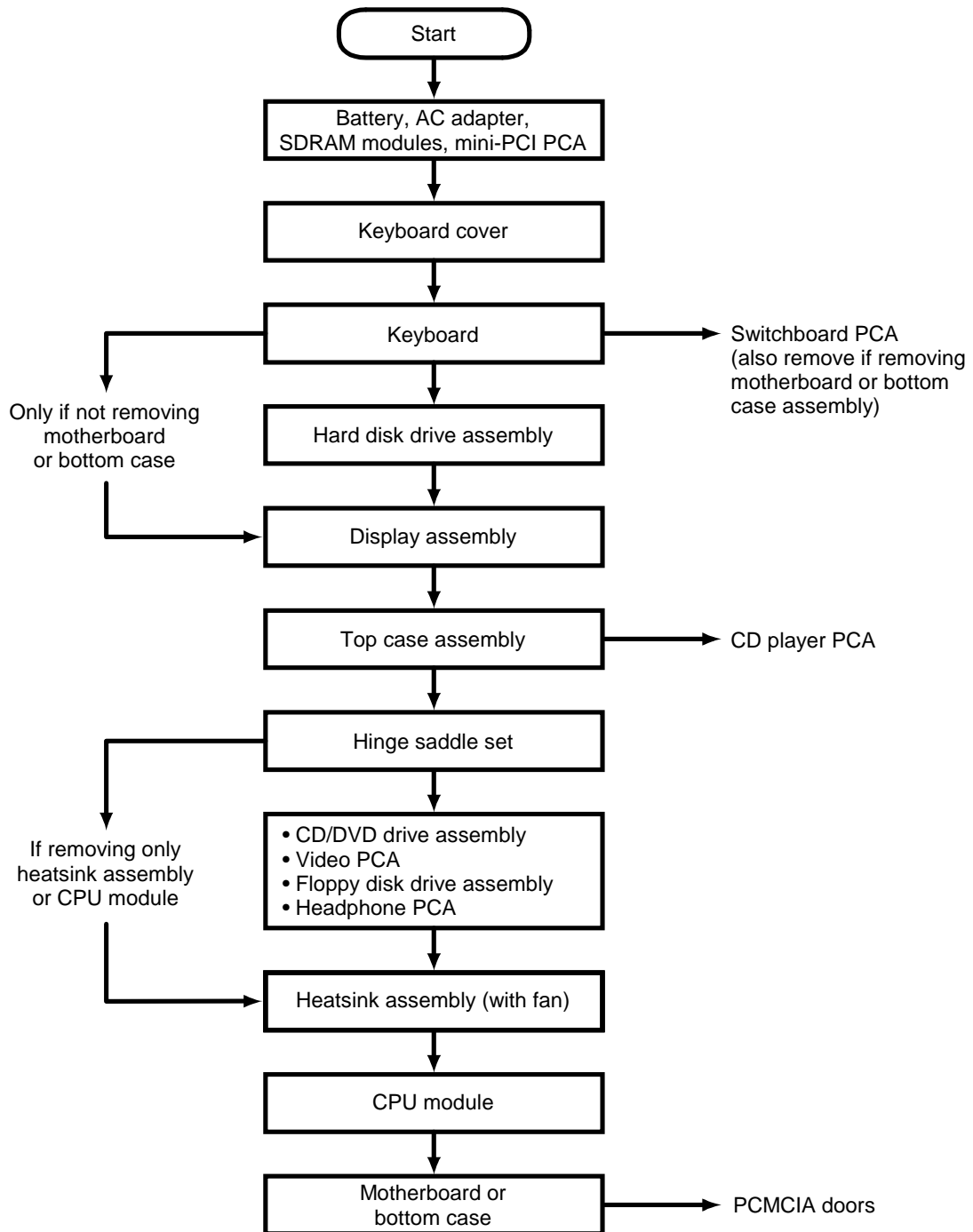
To reassemble a component, perform the removal procedure in reverse order. Any special notes required for reassembly are included at the end of each section.

■ Symbols like this throughout this chapter 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 M2.5x5 mm T-head screw.)

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# Disassembly Flowchart

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



**Figure 2-1. Disassembly Flow**



**Table 2-2. Required Equipment**

- #0 Phillips screwdriver, preferably magnetized.
- Small flat-blade screwdriver.
- 5 mm hexagonal socket screwdriver.
- Electrostatic device (wristband and pad).

**Table 2-3. Recommended Screw Torques**

<b>Screw Thread Size</b>	<b>Torque (cm-kgf)</b>	<b>Torque (in-lbf)</b>
M2.5 (2–11 mm long)	3.0 – 3.5	2.6 – 3.0
M2.5 (12–19 mm long)	2.5 – 3.0	2.2 – 2.6
M3	3.0 – 3.5	2.6 – 3.0

## NOTES

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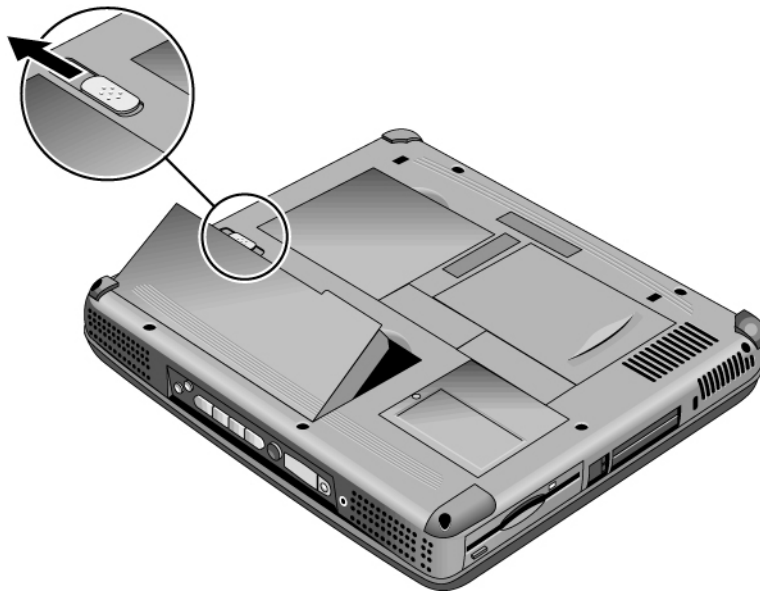
## Removing the Battery (User-Replaceable)

### Required Equipment

- None.

### Removal Procedure

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



**Figure 2-2. Removing the Battery**

### Reassembly Notes

- Insert the front (rounded) end of the battery into the battery compartment, and lower the back end in until it clicks into place.

---

## Removing an SDRAM Module (User-Replaceable)

The notebook has no SDRAM on its motherboard, but has slots for two SDRAM modules.

**Table 2-4. SDRAM Module Replacement Part Numbers**

Description	Part Number	Exchange Part Number
Module, SDRAM, 128 MB, PC133 SODIMM	1818-8504	
Module, SDRAM, 256 MB, PC133 SODIMM	1818-8635	

### Caution

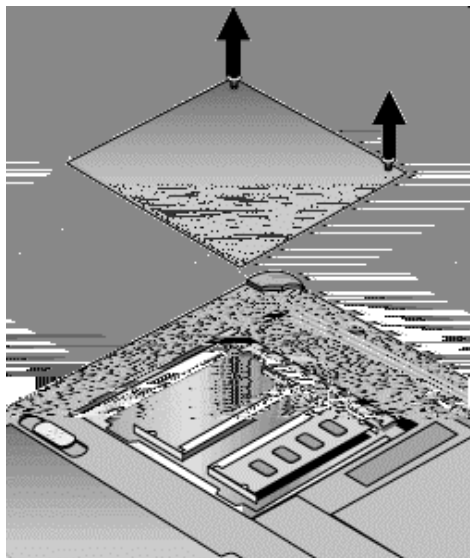
Provide proper grounding and handle the SDRAM module only by its edges, or you could damage the module through electrostatic discharge.

### Required Equipment

- #0 Phillips screwdriver.

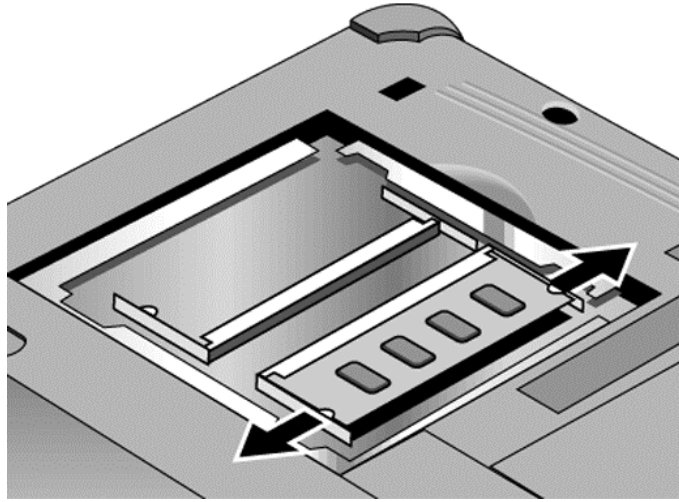
### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. On the bottom of the notebook, loosen both screws holding the SDRAM cover (the cover retains the screws), and remove the cover.



**Figure 2-3. Removing the SDRAM Cover**

3. Press outward to release the latches at the sides of the SDRAM module, so the free edge of the module pops up.



**Figure 2-4. Removing an SDRAM Module**

4. Pull the module out of the connector.

#### **Reassembly Notes**

- Gently 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 module until the latches snap closed.

---

## Removing the Mini-PCI PCA (selected models) (User-Replaceable)

Certain notebook models include a mini-PCI PCA that contains either a modem or modem/LAN.

**Table 2-5. Mini-PCI PCA Replacement Part Numbers**

Description	Part Number	Exchange Part Number
PCA, mini-PCI (LAN/modem)	F2409-60907	
PCA, mini-PCI (LAN/modem) Malaysia	F2409-60908	
PCA, mini-PCI (modem)	F2409-60909	
PCA, mini-PCI (modem) Malaysia	F2409-60910	

### **Caution**

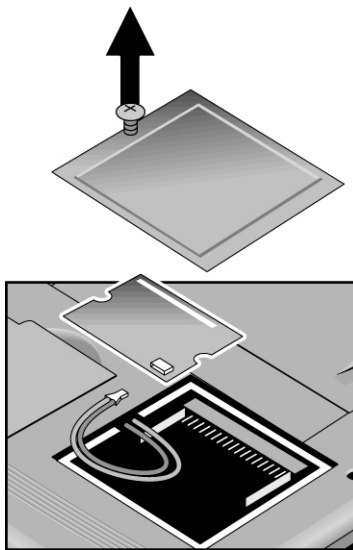
Provide proper grounding and handle the PCA only by its edges, or you could damage it through electrostatic discharge.

### **Required Equipment**

- #0 Phillips screwdriver.

### **Removal Procedure**

1. Unplug the AC adapter, if present, and remove the battery.
2. Loosen the screw holding the mini-PCI cover (the cover retains the screw), and remove the cover.
3. Press outward to release the latches at the sides of the PCA, and carefully lift its free edge up. Note that the PCA has several sticky pads on the side facing the motherboard.
4. Disconnect the cable (modem models only) or cables (modem/LAN models only) from the PCA.
5. Gently pull the PCA out of its connector.



**Figure 2-5. Removing the Mini-PCI PCA**

**Reassembly Notes**

- Reattach the cable (modem models only) or cables (modem/LAN models only) to the PCA, and tuck them into the compartment.
- Gently press the PCA into the connector at an angle of about 30°, until it is fully inserted. Then press down on both sides of the PCA until the latches snap closed.
- Make sure sticky pads on the underside of the PCA are intact. Replace if needed.

---

## Replacing Small Parts (User-Replaceable)

The user can replace the following small parts.

**Table 2-6. Replacing Small Parts (User-Replaceable)**

<b>Part</b>	<b>Replacement Procedure</b>
<b>Cover, mini-PCI</b>	On the bottom of the notebook, loosen the screw in the mini-PCI cover (the cover retains the screw) and remove the cover.
<b>Cover, SDRAM</b>	On the bottom of the notebook, loosen the screws in the SDRAM module cover (the cover retains the screws) and remove the cover.
<b>Covers, screw (on display bezel)</b>	Insert a small flat-blade screwdriver under the cover and pry it loose. To replace, firmly press the adhesive side of the cover into the recess.

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# Removing the Keyboard Cover

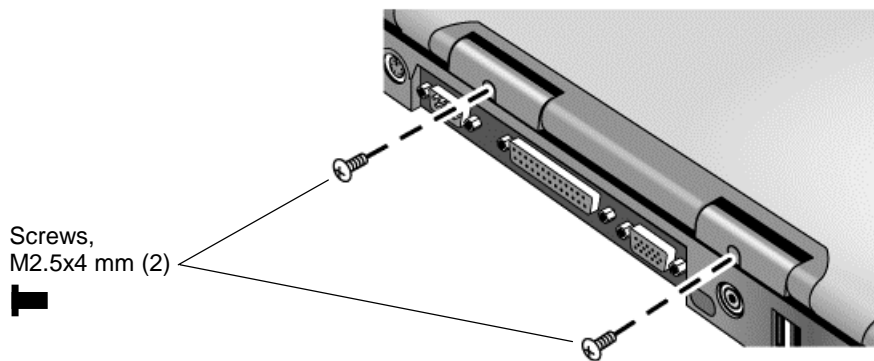
(HP Authorized Service Providers Only)

## Required Equipment

- #0 Phillips screwdriver.
- Small flat-blade screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Close the display, and remove both screws from the backs of the hinge covers.



**Figure 2-6. Removing the Keyboard Cover Retaining Screws**

3. Open the notebook's display so that it lays flat.
4. Use the flat-blade screwdriver to carefully pry up the inside edges of the hinge covers until the cover pops loose, then lift the cover off.





**Figure 2-7. Removing the Keyboard Cover**

#### **Reassembly Notes**

- Tuck the display cables into the notch just to the right of the left display hinge.
- Hold the cover by the hinge covers, bow the center upwards slightly, and snap it into place. This may be easier if you bow the center of the panel upwards slightly as you install it. Note the cover's retaining tabs at the left and center of the cover's bottom edge, and at its upper left and right corners. Make sure these tabs snap back into place when reinstalling the cover.

---

# Removing the Keyboard

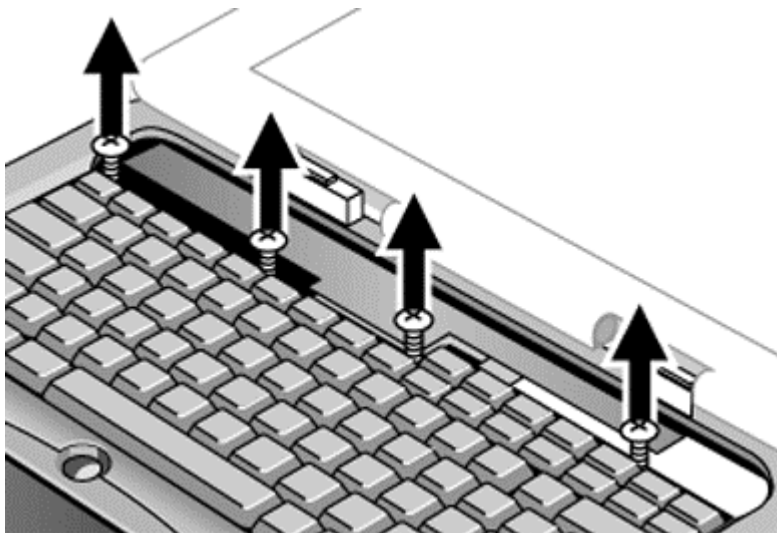
(HP Authorized Service Providers Only)

## Required Equipment

- #0 Phillips screwdriver.
- Small flat-head screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove the keyboard cover (page 2-10).
3. Loosen the four retaining screws along the top of the keyboard (the keyboard retains the screws).



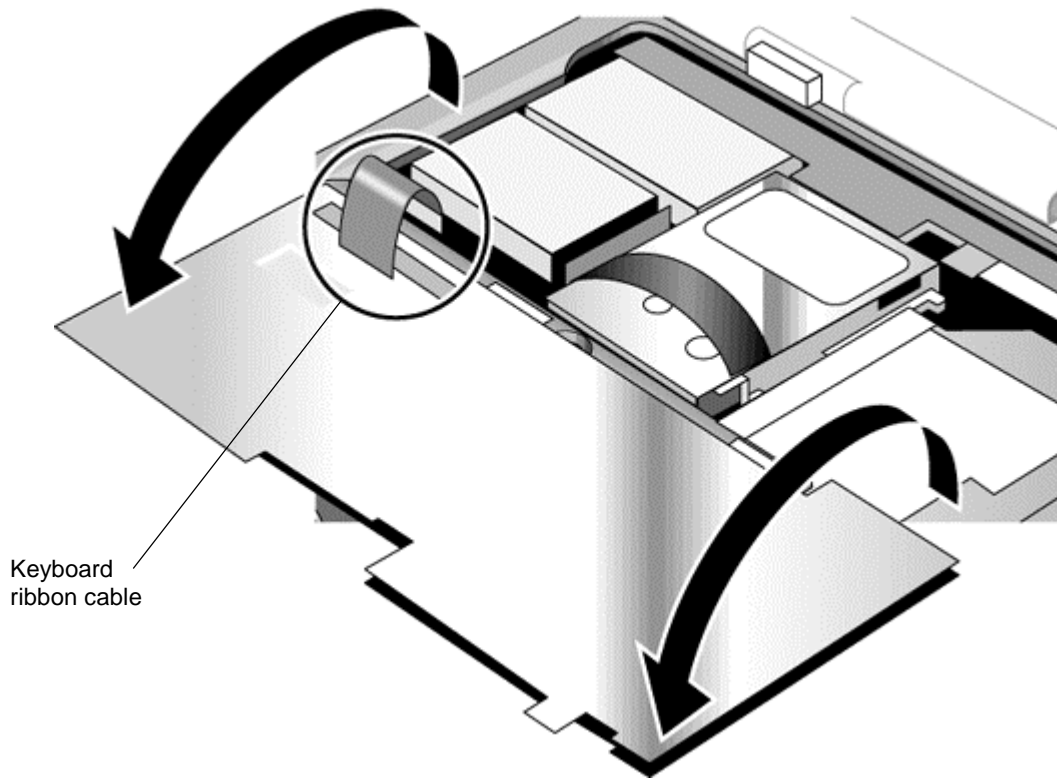
**Figure 2-8. Loosening the Keyboard Retaining Screws**

4. Raise the top of the keyboard, then lift the keyboard up and out of the notebook. Be careful not to pull on the ribbon cable connecting the keyboard to the notebook.

### Caution

Be careful not to touch the heatsink until it has cooled. It could be hot if the notebook was running recently.

5. Lay the keyboard face down on the top case, forward of its normal position, and disconnect the ribbon cable from the motherboard.



**Figure 2-9. Disconnecting the Keyboard Cable**

**Reassembly Notes**

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

---

# Removing the Hard Disk Drive

(HP Authorized Service Providers Only)

**Table 2-7. Hard Disk Drive Replacement Part Numbers**

Description	Part Number	Exchange Part Number
Drive, hard disk (10 GB, 9.5 mm, Hitachi)	F1664-60902	F1664-69002
Drive, hard disk (10 GB, 9.5 mm, Hitachi)	F2072-60908	F2072-69108
Drive, hard disk (10 GB, 9.5 mm, IBM DJSA-210)	F1660-60912	F1660-69112
Drive, hard disk (20 GB, 9.5 mm, Hitachi)	F2072-60913	F2072-69113
Drive, hard disk (20 GB, 9.5 mm, IBM [Diablo] ATA100)	F1660-60914	F1660-69114
Drive, hard disk (30 GB, 9.5 mm, Toshiba ATA66)	F2332-60903	F2332-69003

## Required Equipment

- #0 Phillips screwdriver.

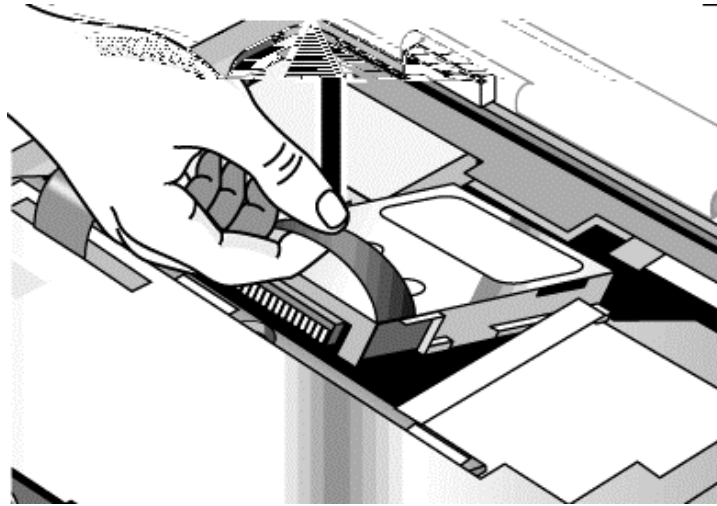
## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).

### Caution

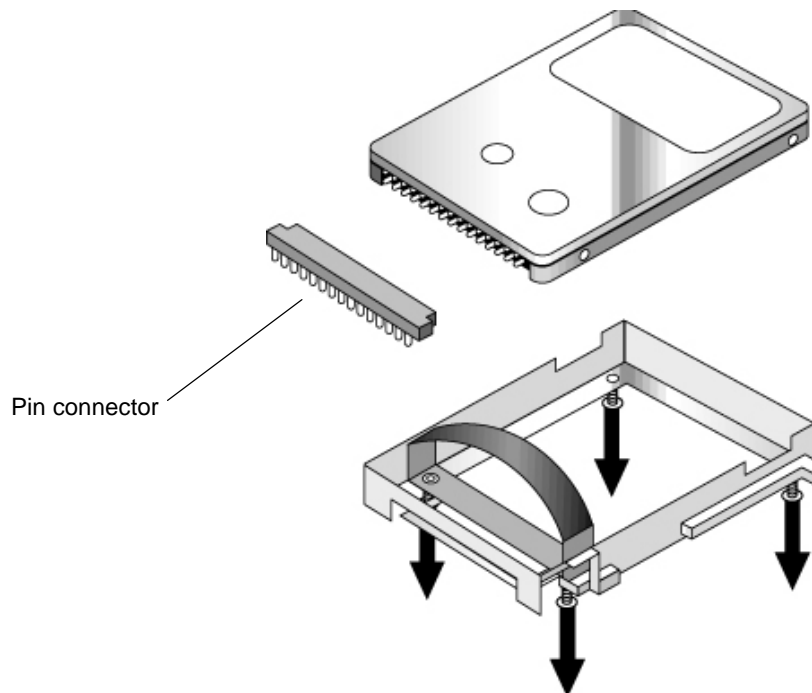
Be careful not to touch the heatsink until it has cooled. It could be hot if the notebook was running recently.

3. Loosen the four screws attaching the hard drive carrier to the motherboard (the carrier retains the screws).
4. Use the strap on the hard drive to carefully pull the drive off of its connector and out of the notebook.



**Figure 2-10. Removing the Hard Disk Drive**

5. Loosen all four screws in the underside of the hard drive carrier (the carrier retains the screws), then slide the drive back and up out of the case.



**Figure 2-11. Removing the Hard Disk Carrier**

6. Carefully remove the pin connector from the end of the drive by working alternately at each side, so that the connector slides off evenly without bending the connector pins.

#### **Reassembly Notes**

- Carefully put the pin connector back onto the pins on the end of the new hard drive. Work at each end alternately so that the connector slides on evenly without bending the connector pins.
- Make sure the tabs on the back of the hard disk carrier fit into their slots on top of the hinge saddle.
- Be careful not to trap the heatsink, keyboard, or speaker cables beneath the hard drive.

## Recovering and Reinstalling Software

You can use the *Recovery CDs* to recover an original build or reinstall the HP custom software. To recover a specific application, see “To recover an application” in the *Reference Guide*.

The *Recovery CDs* provide all HP notebook–specific Windows drivers; these drivers are in the following directories:

- On the hard drive, under `c:\hp\drivers`.
- On the *Recovery CDs*, under `\hp\drivers`.
- On the HP notebook web site at <http://www.hp.com/notebooks>. This web site contains the latest software drivers.

### To recover the factory software installation

The following procedure describes how to recover the notebook’s original Windows software and operating system. The process can take 10 to 15 minutes. (For more information about recovering the factory installation of Windows, see the file `readme.txt` in the root directory of the *Recovery CDs*.)

#### Caution

This procedure formats the hard disk drive, which erases all data on the drive. After formatting, you must reinstall any applications.

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

1. Back up all data from the hard disk.
2. Connect the AC adapter to the notebook.
3. Insert *Recovery CD* disk 1 into the notebook’s CD/DVD drive.
4. Turn on or restart the computer.
5. When the HP logo appears, press Esc to display the Boot menu.
6. Select the CD-ROM/DVD drive as the first boot device, then press Enter.
7. When the *Recovery CD* dialog box appears, follow the displayed instructions. If prompted, accept the recommended partition size.

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

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

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

---

# Removing the Display Assembly

(HP Authorized Service Providers Only)

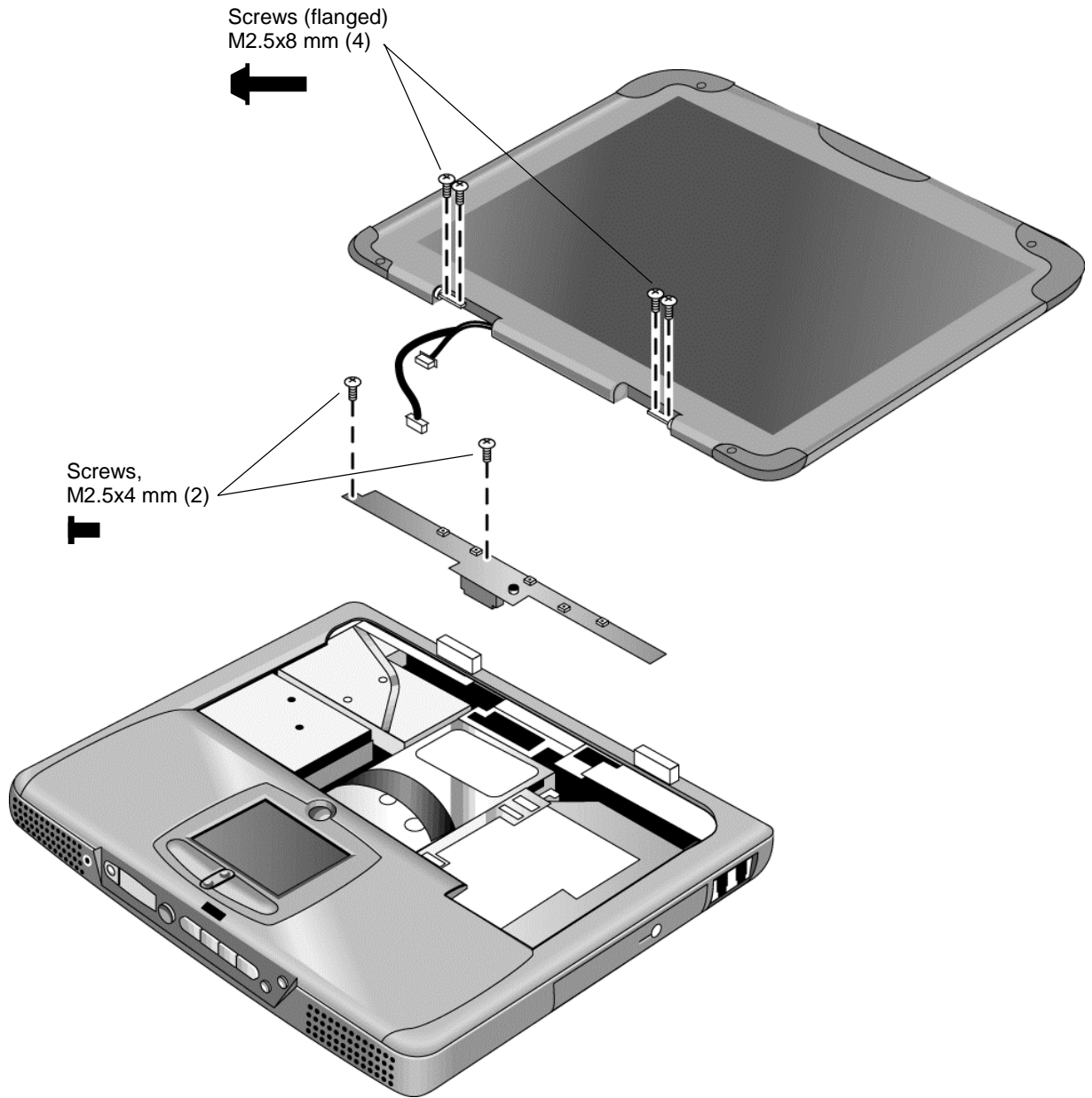
## Required Equipment

- #0 Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
3. Remove both screws from the switchboard PCA, and carefully lift the PCA off the connector underneath it. (Notice the retaining hook at the right end of the PCA.) Be carefully not to pull on the cable attached to the PCA.
4. Disconnect the cable from the switchboard PCA, and remove the PCA from the notebook.
5. Disconnect the cable from the video PCA.
6. Remove the four flanged screws from the display hinges. This may be easier if you support the display so that it remains approximately flat.
7. Lift the display off of the notebook.





**Figure 2-12. Removing the Display**

#### **Reassembly Notes**

- While installing the hinge screws, support the display so that it remains approximately flat.
- Before installing the switchboard PCA, make sure the large display cable lies within the notch in the hinge saddle.
- When installing a new display assembly, follow the procedure given in “Installing a New Display Assembly” on the following page.

## Installing a New Display Assembly

When installing a new display, you must make sure to set the DIP switches on the video PCA to match the particular display assembly.

### Caution

Setting the DIP switches improperly could damage the display assembly.

1. Find the manufacturer of the display: this is shown on a label attached to the display assembly.
2. Find the display's manufacturer and model in the table below, and set the DIP switches on the video PCA as shown.

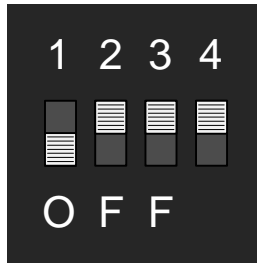
**Table 2-8. Motherboard Video DIP Switch Settings for Technology Code GE Models**

Model	1	2	3	4
Hitachi 15.0-in TFT SXGA+	ON	OFF	OFF	OFF
Hitachi 15.0-in TFT XGA	OFF	ON	OFF	OFF
UNIPAC 13.3-in TFT XGA	OFF	OFF	ON	OFF
CPT 14.1-in TFT XGA	ON	OFF	ON	OFF
IBM 14.1-in TFT XGA	OFF	ON	ON	OFF
LG 15.0-in TFT XGA	ON	ON	ON	OFF
UNIPAC 14.1-in TFT XGA	OFF	OFF	OFF	ON
LG 13.3-in TFT XGA	ON	OFF	OFF	ON
LG 14.1-in TFT XGA	OFF	ON	OFF	ON
IBM 15.0-in TFT SXGA+	ON	ON	OFF	ON
CPT 15.0-in TFT SXGA+	OFF	ON	ON	ON

**Table 2-9. Motherboard Video DIP Switch Settings for Technology Code GD Models**

Model	1	2	3	4
Samsung 14.1-in TFT XGA	ON	OFF	OFF	OFF
Hitachi 15.0-in TFT XGA	OFF	ON	OFF	OFF
UNIPAC 13.3-in TFT XGA	OFF	OFF	ON	OFF
CPT 14.1-in TFT XGA	ON	OFF	ON	OFF
IBM 14.1-in TFT XGA	OFF	ON	ON	OFF
LG 15.0-in TFT XGA	ON	ON	ON	OFF
UNIPAC 14.1-in TFT XGA	OFF	OFF	OFF	ON
LG 13.3-in TFT XGA	ON	OFF	OFF	ON
LG 14.1-in TFT XGA	OFF	ON	OFF	ON
HannStar 15.0-in TFT XGA	ON	OFF	ON	ON
CPT 15.0-in TFT SXGA+	OFF	ON	ON	ON

As an example, the following figure shows the DIP switches set to OFF-ON-ON-ON:



**Figure 2-13. Video PCA DIP Switches**

---

# Removing the Top Case

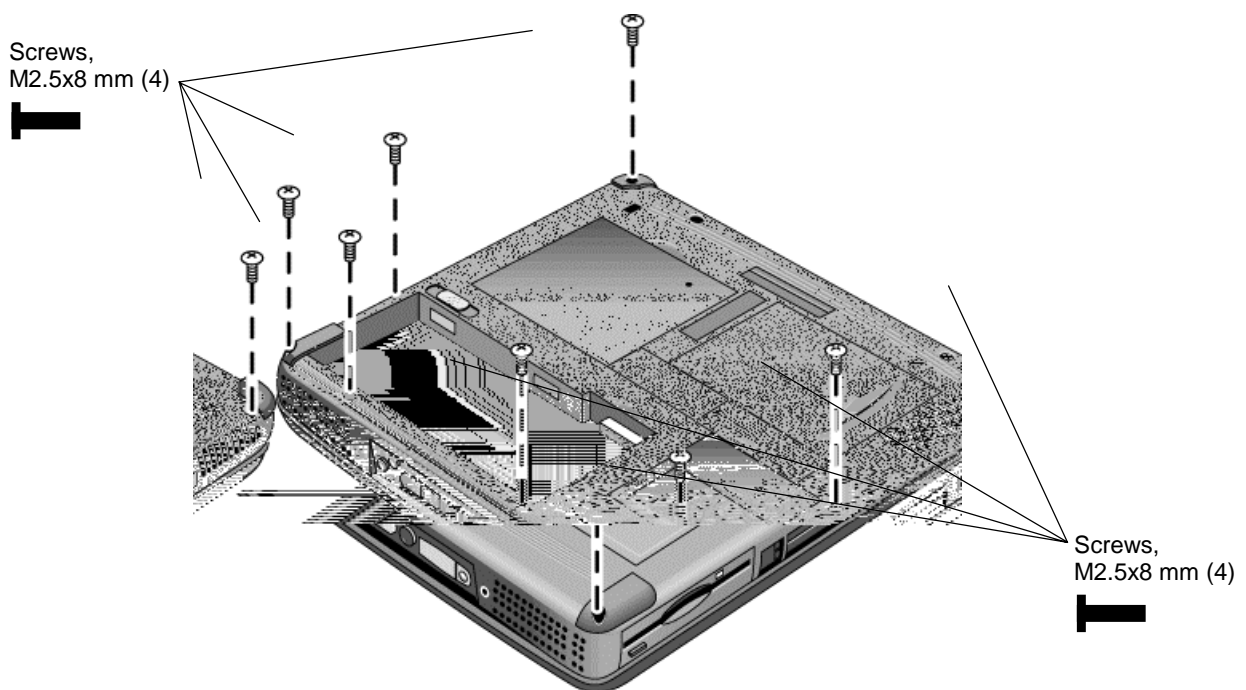
(HP Authorized Service Providers Only)

## Required Equipment

- #0 Phillips screwdriver.

## Removal Procedure

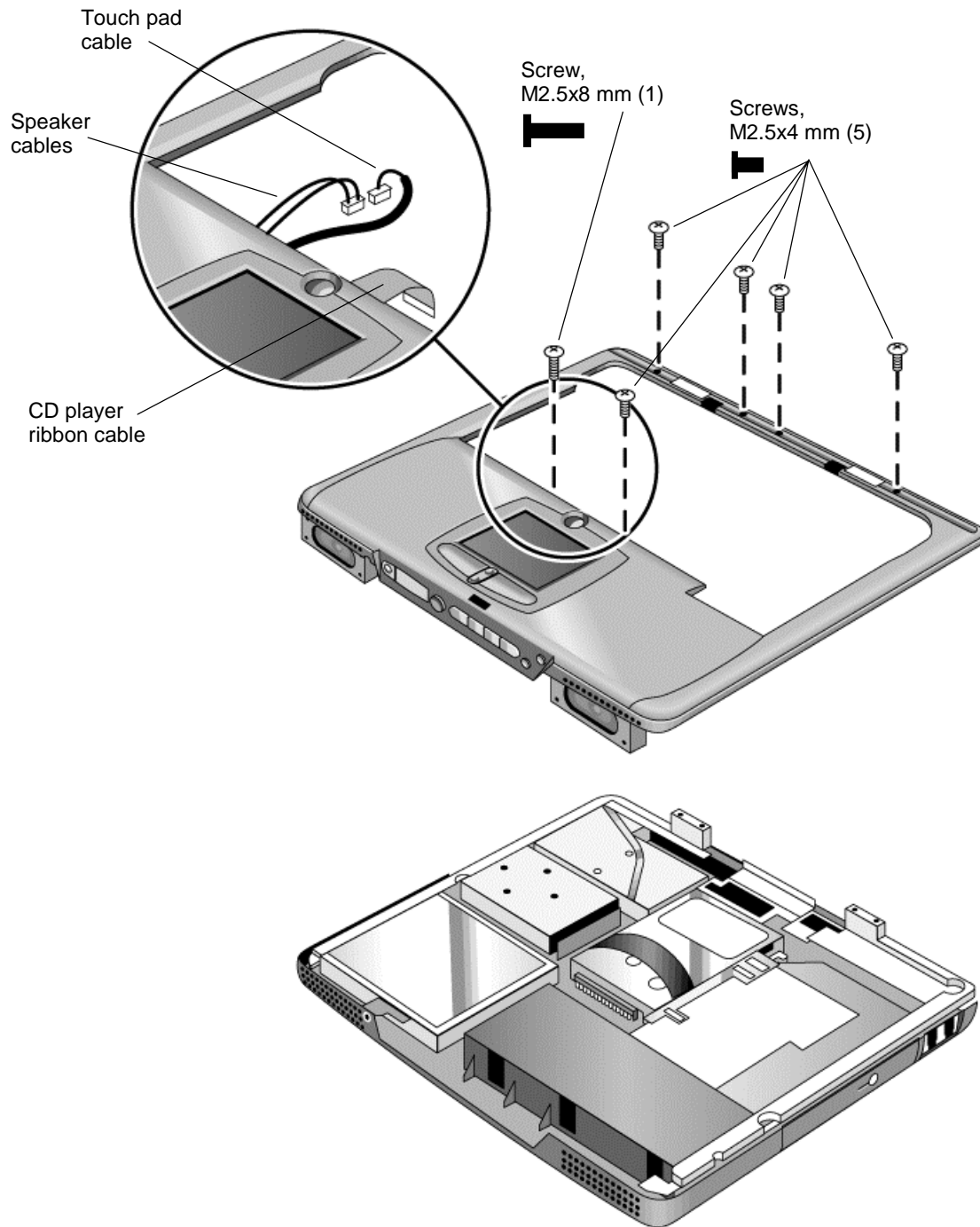
1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
3. Remove the eight retaining screws from the bottom case.



**Figure 2-14. Removing the Top Case Retaining Screws**

4. Disconnect the touch pad cable and speaker cable from the motherboard.
5. Remove the six retaining screws from the top case.
6. Raise the back of the top case, then gradually loosen the case, moving toward the front of the notebook (the right rear corner may require extra care to work free).
7. Carefully lift the top cover forward and off of the notebook. Be careful not to pull on the CD player PCA ribbon cable beneath the case.

8. Release the CD player PCA cable from the motherboard.



**Figure 2-15. Removing the Top Case**

**Reassembly Notes**

- Make sure the touch pad cable and speaker cable connectors are fully inserted squarely in their sockets.
- Make sure the tabs along the edges of the case snap shut.

---

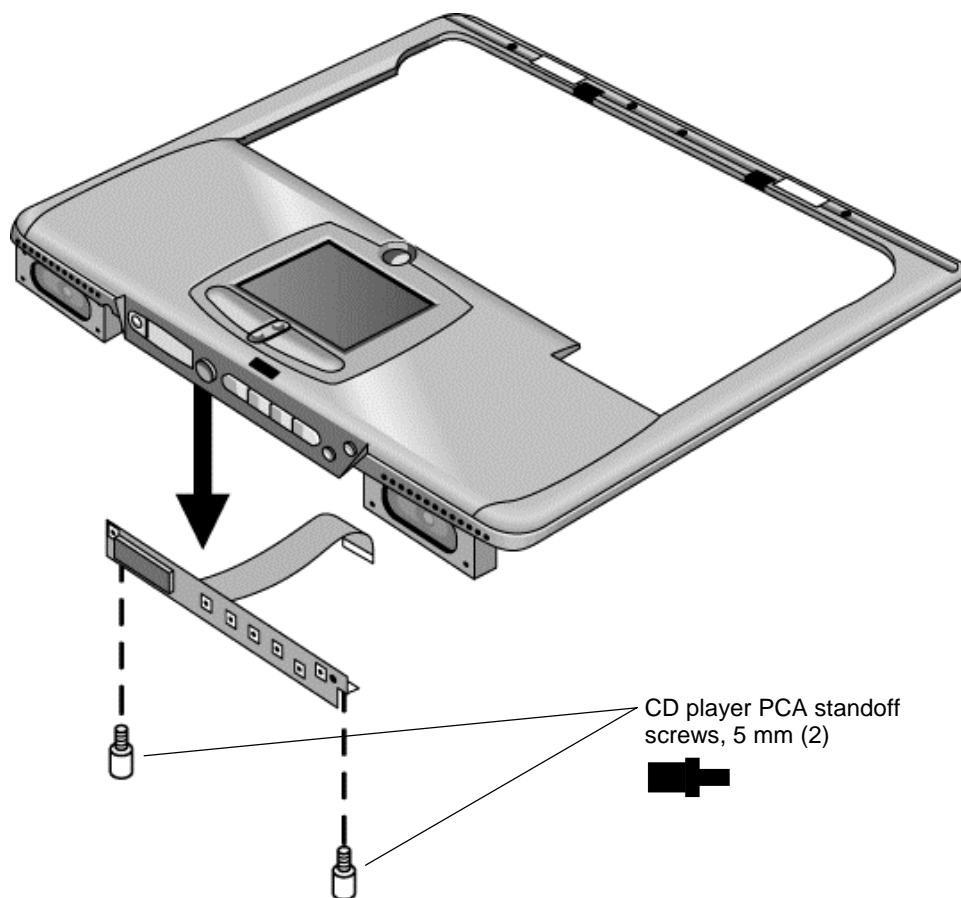
## Removing the CD Player PCA (selected models) (HP Authorized Service Providers Only)

### Required Equipment

- #0 Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
3. Remove both standoff screws (use a 5 mm socket screwdriver), and lift the PCA out of the top case.



**Figure 2-16. Removing the CD Player PCA**

---

## Removing the Hinge Saddle Set

(HP Authorized Service Providers Only)

### Required Equipment

- #0 Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
3. Remove the two retaining screws from the bottom case.

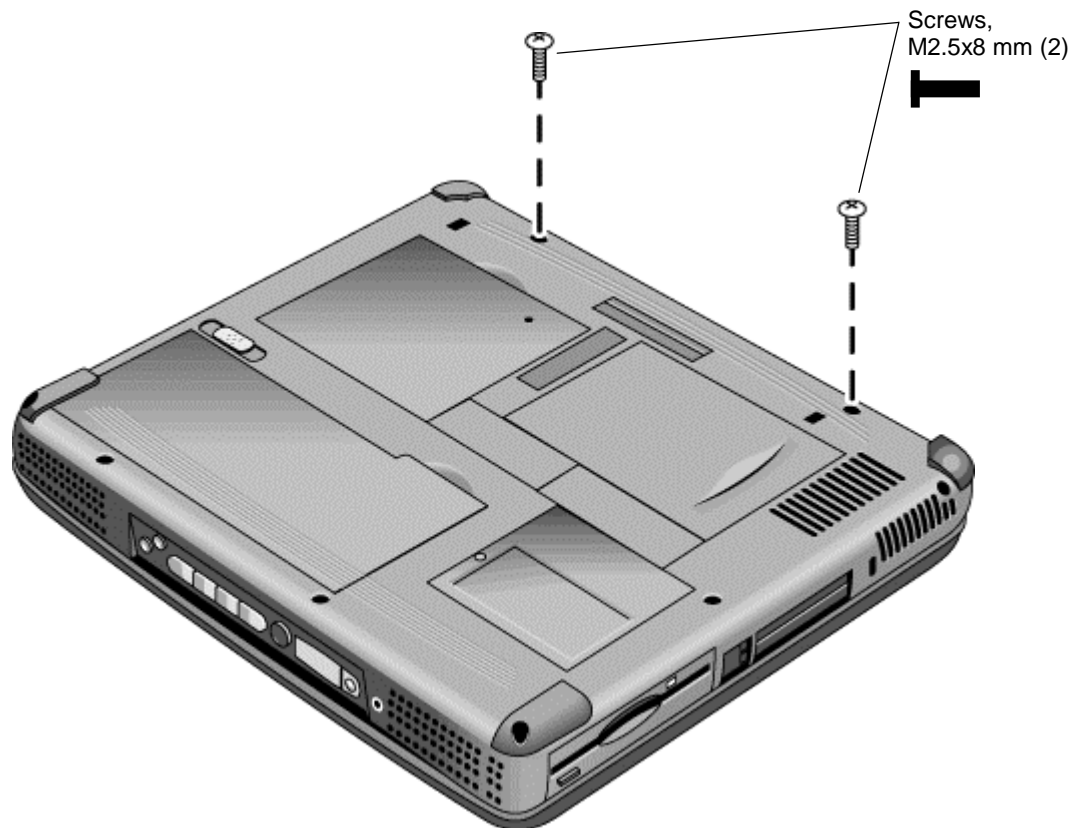
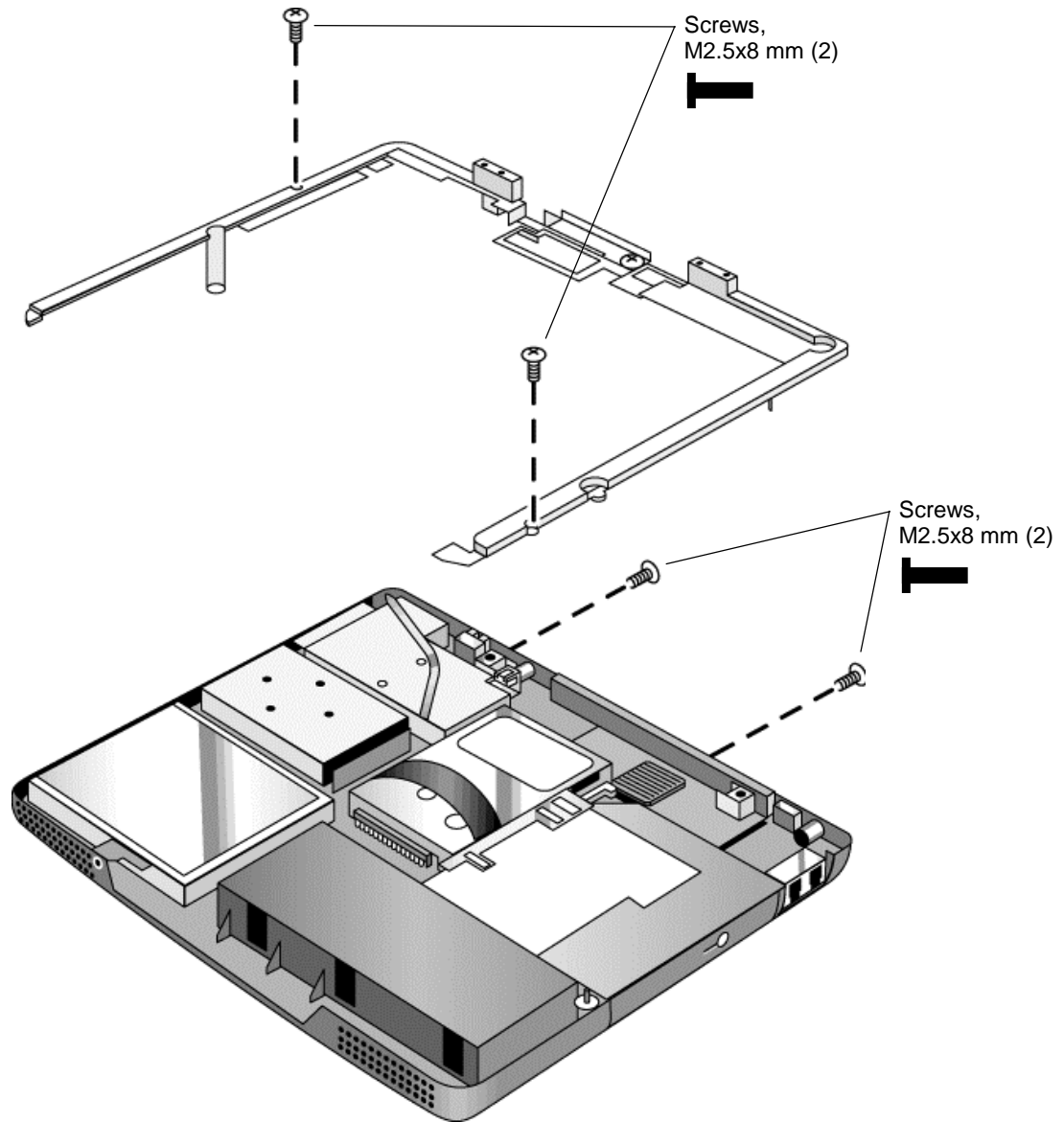


Figure 2-17. Removing the Hinge Saddle Retaining Screws

4. Remove the retaining screws from the back of the notebook, just below the display hinges.
5. Remove both retaining screws from the hinge saddle set.
6. Lift the hinge saddle set out of the notebook. You may need to free the hinge saddle from the clip in the bottom case near the LAN/modem ports to remove it.



**Figure 2-18. Removing the Hinge Saddle**

#### **Reassembly Notes**

- Make sure the posts on the underside of the hinge saddle line up with the hinge support openings in the bottom case, and that the holes in the front ends of the saddle fit over the alignment posts in the bottom case.



---

# Removing the Video PCA

## (HP Authorized Service Providers Only)

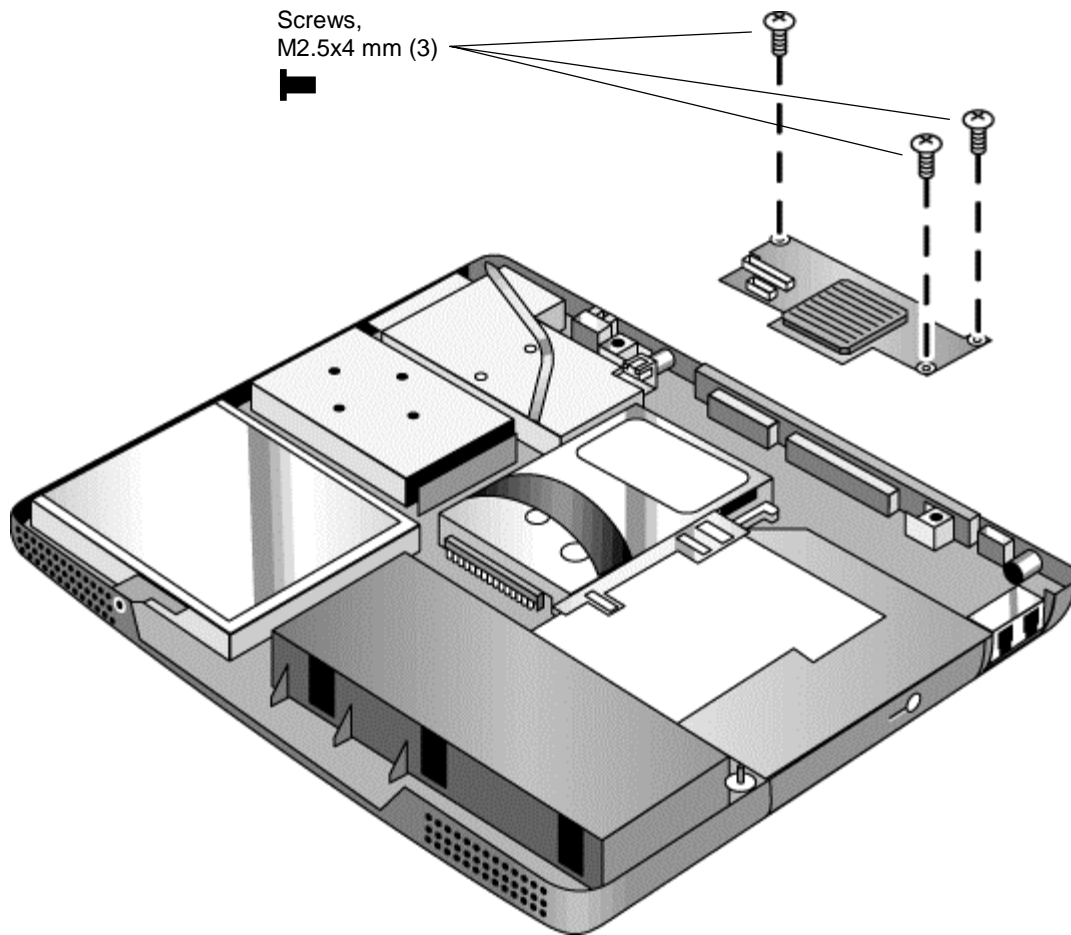
### Required Equipment

- #0 Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
  - Hinge saddle set (page 2-25).
3. Note and record the settings of the PCA's DIP switches.

4. Remove all three retaining screws from the PCA, and carefully lift it off of the connectors underneath it.



**Figure 2-19. Removing the Video PCA**

#### **Reassembly Notes**

- Set the DIP switches on the new PCA to match the settings from the PCA you are replacing and the notebook's display type. See the settings tables on page 2-20.
- Make sure the protective pads on the PCA are intact, and replace if needed.
- Make sure the PCA is firmly set on its connectors.

---

# Removing the Heatsink Assembly (with Fan)

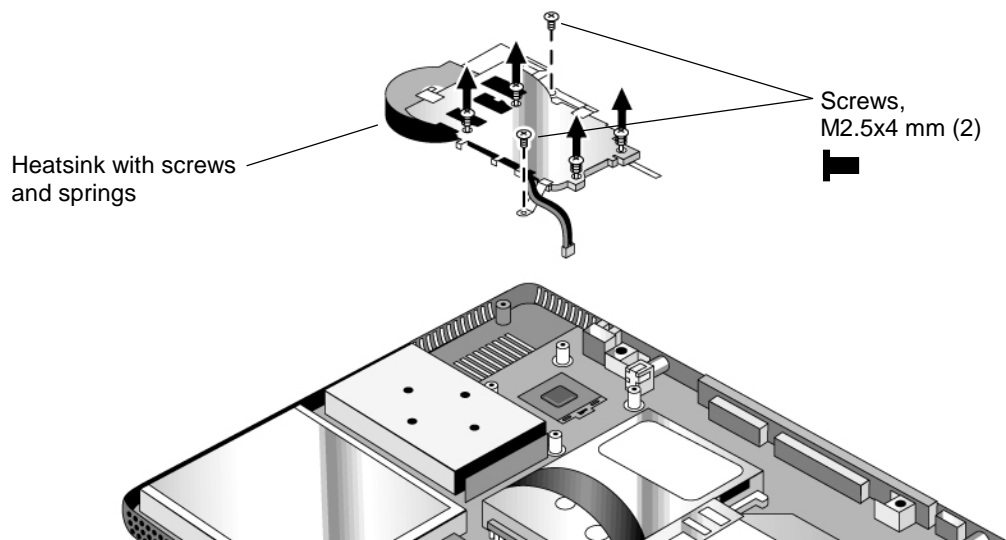
(HP Authorized Service Providers Only)

## Required Equipment

- #0 Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
  - Hinge saddle set (page 2-25).
3. Disconnect the fan cable from the motherboard.
4. Loosen the four retaining screws with springs attached to them (the heatsink retains these screws).
5. Remove the two remaining screws.
6. Lift the heatsink out of the notebook.



**Figure 2-20. Removing the Heatsink Assembly**

## Reassembly Notes

- Make sure the fan cable is not pinned under the assembly.
- Make sure the thermal pad on the heatsink is not damaged, and replace if necessary.

---

# Removing the CPU Module

(HP Authorized Service Providers Only)

**Table 2-10. CPU Module Replacement Part Numbers**

Description	Part Number	Exchange Part Number
Module, CPU (AMD Athlon, 1.1 GHz)	1822-0582	F3930-69101
Module, CPU (AMD Athlon, 1 GHz)	1822-0259	F2409-69104
Module, CPU (AMD Athlon, 950 MHz)	1822-0258	F3928-69101
Module, CPU (AMD Athlon, 900 MHz)	1822-0257	F2409-69103
Module, CPU (AMD Duron, 900 MHz)	1822-0580	F3931-69101
Module, CPU (AMD Duron, 850 MHz)	1822-0497	F2410-69102
Module, CPU (AMD Duron, 800 MHz)	1822-0528	F2410-69101

## Required Equipment

- #0 Phillips screwdriver.
- Small flat-blade screwdriver.
- AMD CPU removal kit.

## Removal Procedure

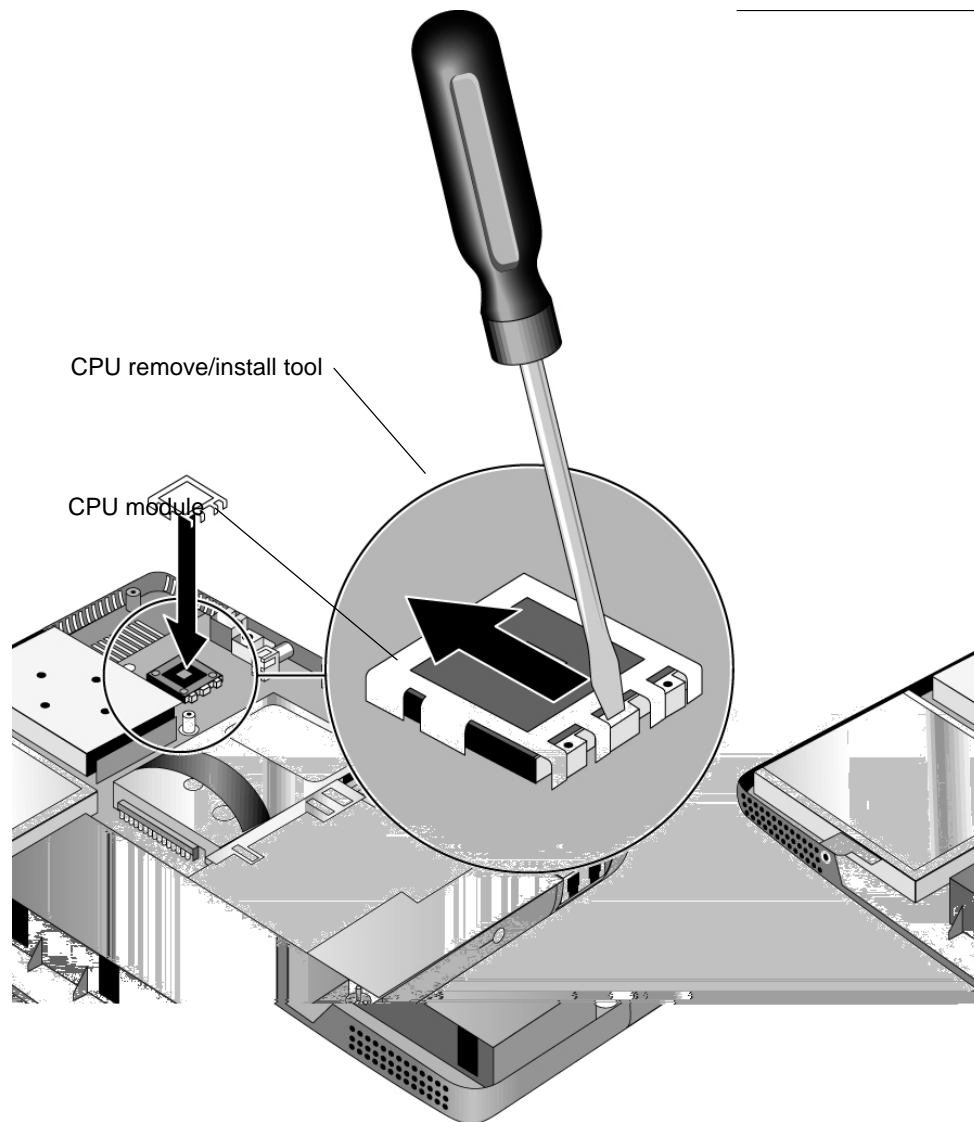
### Caution

Be careful not to touch the upper surface of the CPU module. Handle it only by its edges, or you could damage it.

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
  - Hinge saddle set (page 2-25).
  - Heatsink assembly (page 2-29).
3. Carefully place the CPU removal tool over the CPU.
4. Insert the tip of a flat-blade screwdriver into the notch marked OPEN on the CPU mount bracket, and tilt the screwdriver toward the CPU.

### Caution

Make sure the screwdriver applies pressure to the CPU removal tool, and not to the CPU itself.



**Figure 2-21. Removing the CPU Module**

### Reassembly Notes

- Two of the CPU module's corners have no pins, and two corners of the CPU socket have no holes. Align the module for reinstallation accordingly.
- Make sure none of the module's pins are bent or otherwise damaged.
- Make sure the round pads on top of the CPU module are intact, and replace if needed.
- Insert the tip of a flat-blade screwdriver into the notch marked LOCK on the CPU mount bracket, and tilt the screwdriver toward the CPU. Make sure the screwdriver applies pressure to the CPU removal tool, and not to the CPU itself.

---

# Removing the Floppy Disk Drive

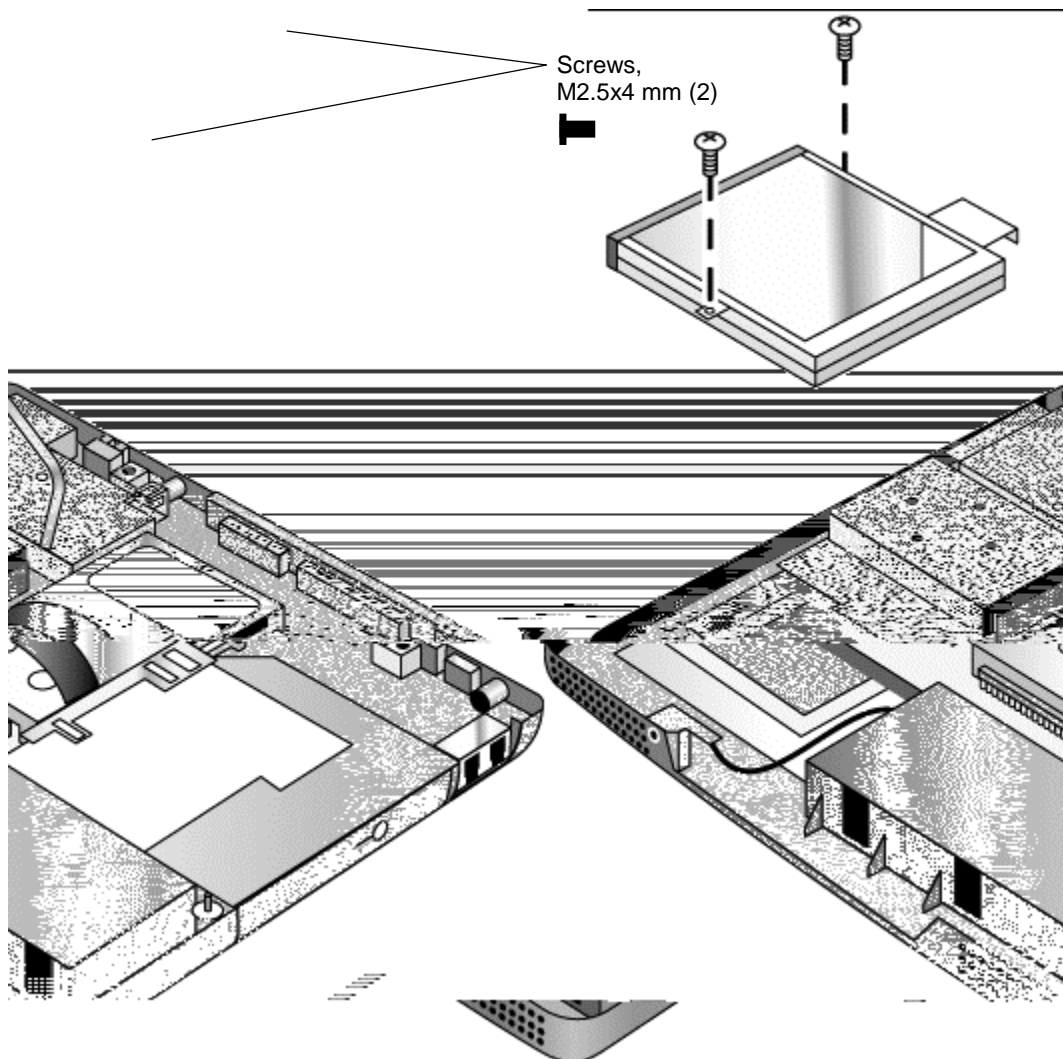
(HP Authorized Service Providers Only)

## Required Equipment

- #0 Phillips screwdriver.

## Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
  - Hinge saddle set (page 2-25).
2. Release the drive's ribbon cable from its connector on the motherboard.
3. Remove the two retaining screws.
4. Lift the floppy drive out of the notebook.



**Figure 2-22. Removing the Floppy Disk Drive**

**Reassembly Notes**

- Make sure the headphone PCA lies under the floppy disk drive bracket.
- Make sure the headphone PCA cable is not trapped under the floppy disk drive.

---

## Removing the CD/DVD Drive

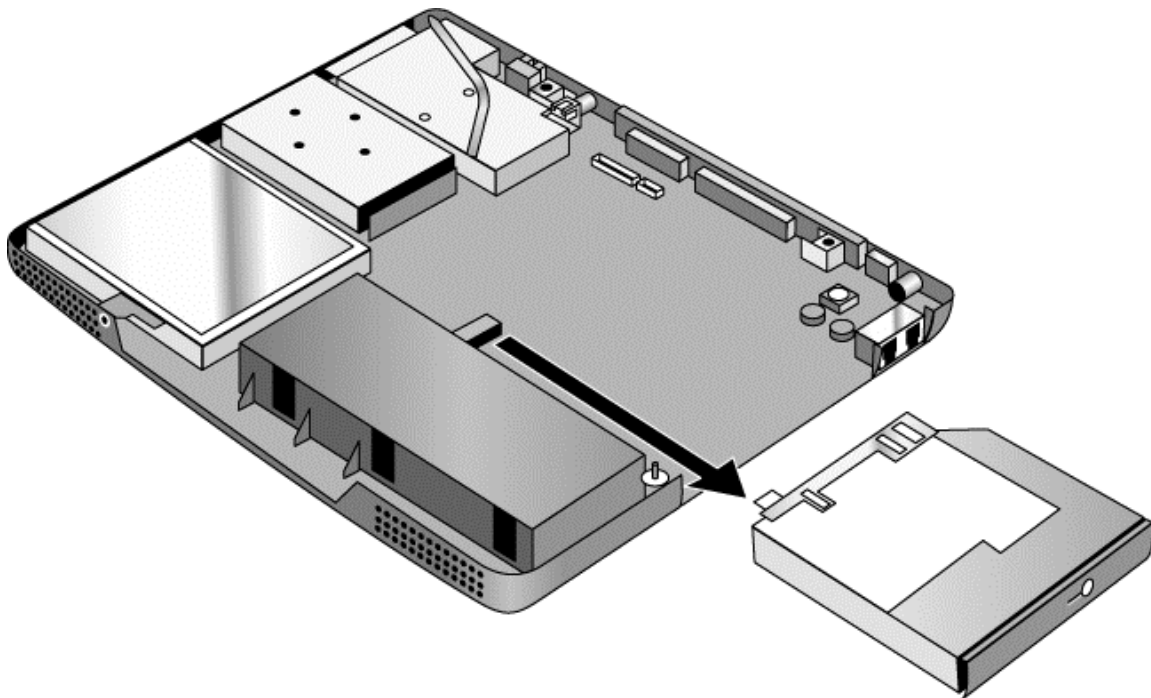
(HP Authorized Service Providers Only)

### Required Equipment

- #0 Phillips screwdriver.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Hard disk drive (page 2-14).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
  - Hinge saddle set (page 2-25).
2. Pull the drive to the right, off of its connector and out of the notebook.



**Figure 2-23. Removing the CD/DVD Drive**

### Reassembly Notes

- Place the drive so that its connector aligns with that on the motherboard, then gently press it to the left and into place.



---

# Removing the Motherboard or Bottom Case

## (HP Authorized Service Providers Only)

### Required Equipment

- #0 Phillips screwdriver.
- 5 mm hexagonal socket screwdriver.

### When Installing a New Motherboard

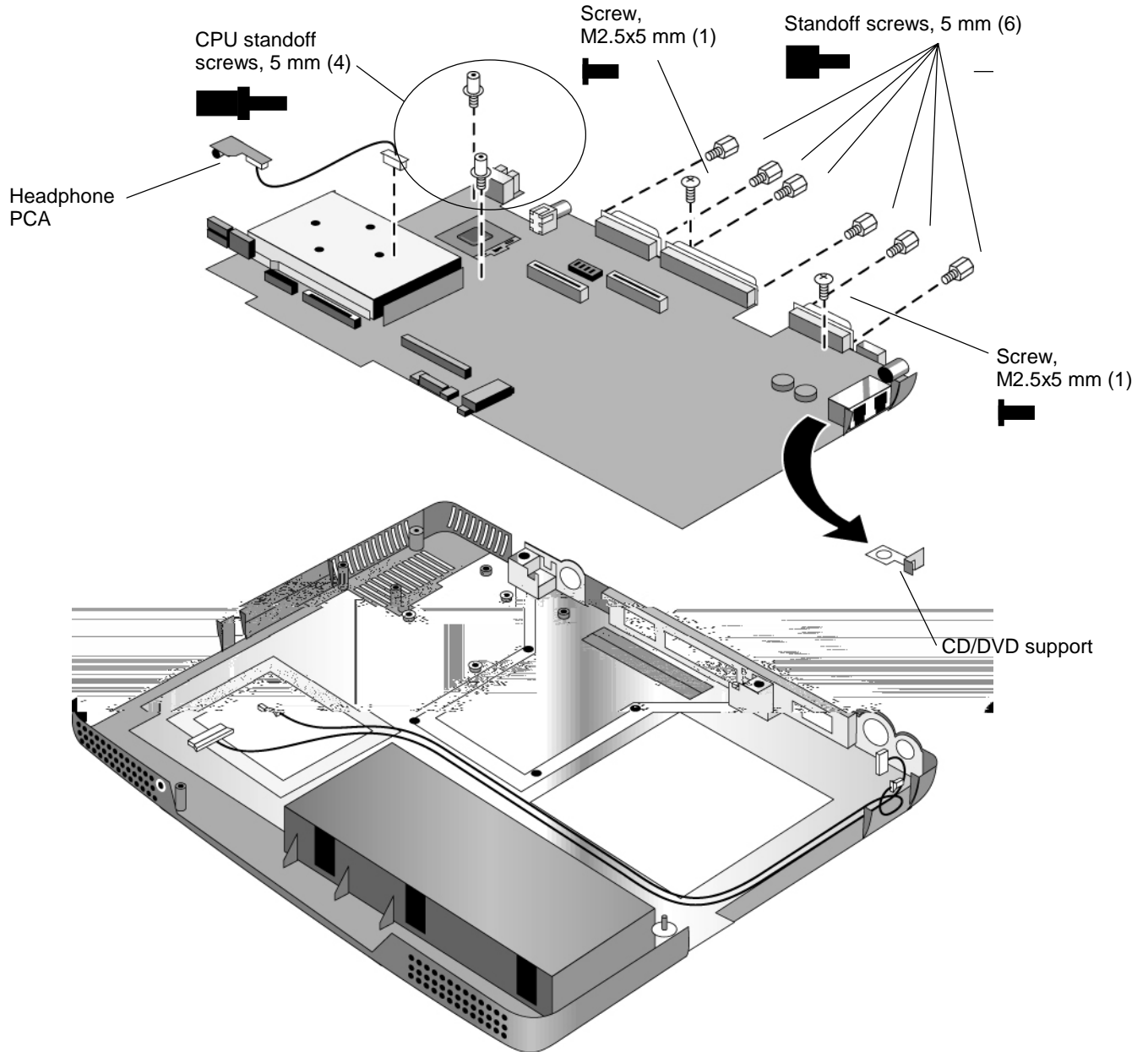
Before replacing the motherboard, you must (if possible) electronically store the motherboard's serial number and service ID for transfer to the new motherboard.

1. Exit Windows and boot to a DOS prompt:
2. Run ESN.EXE from one of these sources:
  - On a factory software installation, change to \hp\drivers\hputils and type **esn** at the prompt.
  - or –
  - Copy \hp\drivers\hputils\ESN.EXE from the *Recovery CD*, then run it on the notebook.
3. Save the serial number and service ID.

### Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.
2. Remove these additional assemblies:
  - Battery (page 2-4).
  - SDRAM modules (page 2-5).
  - Mini-PCI PCA (page 2-7).
  - Keyboard cover (page 2-10).
  - Keyboard (page 2-12).
  - Hard disk drive (page 2-14).
  - Display assembly (page 2-18).
  - Top case (page 2-22).
  - Hinge saddle set (page 2-25).
  - Video PCA (page 2-27).
  - Heatsink assembly (page 2-29).
  - CPU module (page 2-30).
  - Floppy disk drive (page 2-32).
  - CD/DVD drive (page 2-34).
3. Remove the standoff screws from the back of the notebook.
4. Remove both retaining screws from the motherboard.
5. Disconnect the cable (modem models only) or cables (modem/LAN models only) at the right rear corner of the motherboard.

6. Disconnect the cable from the headphone PCA, and remove the PCA.
7. Remove the CPU standoffs.
8. Remove the CD/DVD drive support from near the right rear corner of the motherboard.
9. Lift the front edge of the motherboard slightly, then lift the motherboard forward and out of the bottom case.



**Figure 2-24. Removing the Motherboard**

#### Reassembly Procedure

- When reinstalling the motherboard, see “Reinstalling the Motherboard” on page 2-37.
- When reinstalling the bottom case, see “Replacing the Bottom Case” on page 2-38.

# Reinstalling the Motherboard

## Reassembly Procedure

1. Insert the I/O connectors through their openings in the bottom case, then lower the motherboard into place.
  - Be careful not to trap the modem or modem/LAN cable(s) or headphone PCA cable under the motherboard (modem and modem/LAN models only).
  - Fit the modem cable through the notch on the edge of the motherboard, and make sure the LAN cable doesn't block the nearby screw tab.
  - Make sure the alignment posts in the bottom case fit through the holes at the back left and front right corners of the motherboard.
2. Reconnect the cable (modem models only) or cables (modem/LAN models only) at the right rear corner of the motherboard.
3. Reconnect the headphone PCA cable.

## When Installing a New Motherboard

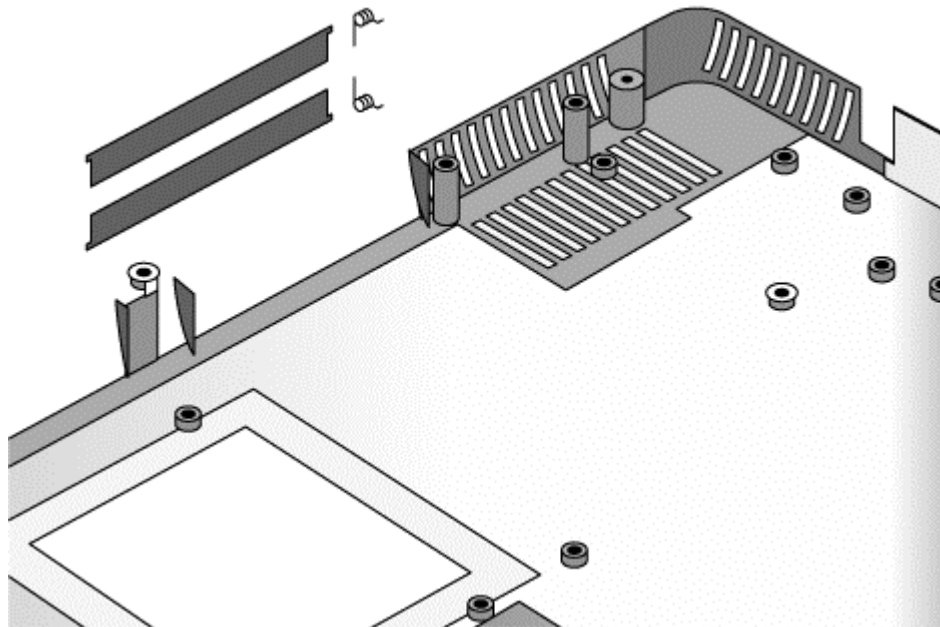
After installing a new motherboard, you must electronically transfer to it the serial number and service ID from the previous motherboard.

1. Exit Windows and boot to a DOS prompt.
2. Run ESN.EXE from the same source you ran it from when saving the serial number and service ID from the previous motherboard:
  - On a factory software installation, change to `\hp\drivers\hputils` and type **esn** at the prompt.  
– or –
  - Copy `\hp\drivers\hputils\ESN.EXE` from the *Recovery CD*, then run it on the notebook.
3. Install the serial number and service ID.
  - If you are prompted for the serial number, type the serial number shown on the bottom of the case.
  - If a serial number has already been stored, you must call an HP support center to change it.

## Replacing the Bottom Case

### Installation Procedure

1. Install a new Microsoft Product ID label.
2. Transfer the old serial number label and install a new overlay, or create a new serial number label using the steps below.
3. If you need to install or replace the PCMCIA doors, refer to the figure below.

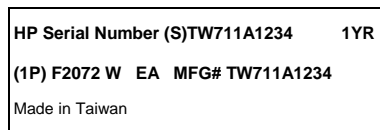


**Figure 2-25. Installing the PCMCIA Doors**

## 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 vi) under Support/Service in Technical Support Information, or from <http://www.mcd.hp.com>. Store it with other Word templates on a PC connected to a laser printer. The latest version includes fields for warranty period and manufacturing location.

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. While holding the paper label in place, attach a serial label overlay into the outer recess. It covers and protects the serial label.



**Figure 2-26. Example of Serial Number Label**

# Removing Notebook Components

(HP Authorized Service Providers Only)

## Required Equipment

- #0 Phillips screwdriver.
- Small flat-blade screwdriver.
- 5 mm hexagonal socket screwdriver.

## Removal Procedure

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

**Table 2-11. Removing Notebook Components**

Component	Removal Procedure	Additional Steps
Case, bottom	See page 2-35.	
Case, top	See page 2-22.	
Cover, keyboard	See page 2-10.	
CPU module	See page 2-30.	
Display assembly	See page 2-18.	
Doors, PCMCIA	Mini-PCI PCA (page 2-7). Keyboard cover (page 2-10). Keyboard (page 2-12). Hard disk drive (page 2-14). Display assembly (page 2-18). Top case (page 2-22). Hinge saddle set (page 2-25). Video PCA (page 2-27). Heatsink assembly (page 2-29). CPU module (page 2-30). Floppy disk drive (page 2-32). CD/DVD drive (page 2-34). Motherboard (page 2-35).	See the figure on page 2-38.
Drive, CD/DVD	See page 2-34.	
Drive, floppy disk	See page 2-32.	
Heatsink assembly	See page 2-29.	

<b>Component</b>	<b>Removal Procedure</b>	<b>Additional Steps</b>
<b>Keyboard</b>	See page 2-12.	
<b>PCA, CD player</b>	See page 2-24.	
<b>PCA, headphone</b>	Keyboard cover (page 2-10). Keyboard (page 2-12). Display assembly (page 2-18). Top case (page 2-22). Hinge saddle set (page 2-25).	Remove the retaining screw from the PCA, disconnect the cable to the motherboard, and lift the PCA out of the notebook. You can lift the floppy drive slightly for access.
<b>PCA, motherboard</b>	See page 2-35.	
<b>PCA, switchboard</b>	Keyboard cover (page 2-10). Keyboard (page 2-12).	Remove both screws (M2.5x4 mm) from the PCA, and carefully lift the PCA off of the connector beneath it. <i>Be careful not to pull on the cable attached to the PCA.</i> Disconnect the cable from the PCA and remove the PCA from the notebook.
<b>PCA, video</b>	See page 2-27.	
<b>Saddle, hinge set</b>	See page 2-25.	
<b>Socket, PCMCIA</b>	Keyboard cover (page 2-10). Keyboard (page 2-12). Display assembly (page 2-18). Top case (page 2-22). Hinge saddle set (page 2-25).	Remove the four screws attaching the PCMCIA socket to the motherboard (M2.5x5 mm), and remove the socket.





# Troubleshooting and Diagnostics

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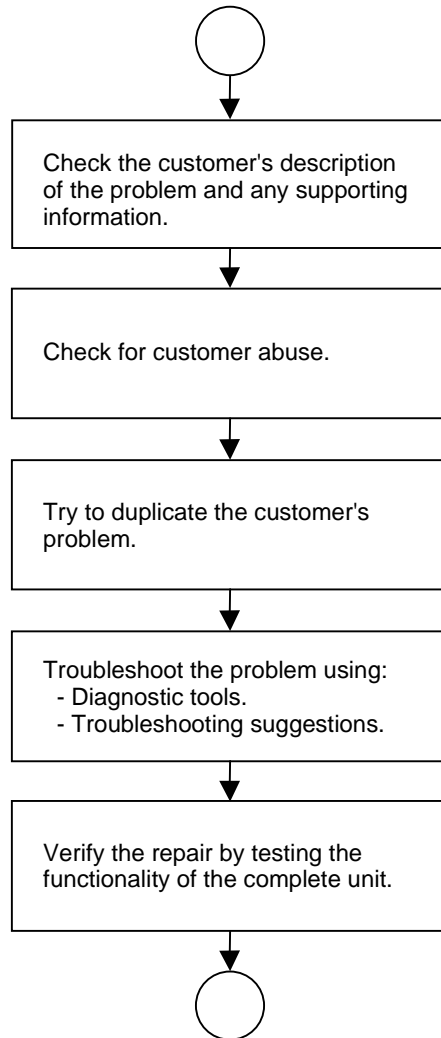
This chapter includes troubleshooting and diagnostic information for testing the functionality of the notebook, and for identifying faulty components.

- Troubleshooting information
  - Checking for customer abuse (page 3-3).
  - Troubleshooting the problem (page 3-4).
  - Verifying the repair (page 3-4).
  - Suggestions for troubleshooting (page 3-5).
- Diagnostic tools
  - e-DiagTools diagnostic program (page 3-22).
  - Power-on self-test (page 3-28).
  - Sycard PCCtest 450 PC Card (page 3-31).
  - Desktop/Windows Management Interface (page 3-32).
  - BIOS Setup utility (page 3-33).

---

# 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 units may 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 unit shows any of the following, customer abuse is declared:
  - Missing parts.
  - Broken plastic parts.
  - Parts not original to the unit.
  - Damaged or missing keys on the keyboard.

Table 3-2 on page 3-6 includes additional criteria for determining customer abuse to specific parts of the unit.

**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 (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 is more than one symptom, 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 the possible causes.
  - The e-DiagTools diagnostic program tests most of the notebook's components using automatic and interactive tests, and will be your primary troubleshooting tool. Other tools include the power-on self-test, DMI/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 in Table 3-2 on page 3-6 include general suggestions for repairing units that show specific failure symptoms.

Swapping modules that may 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 system-off switch: this resets the notebook, 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 all of the following tests:

- **e-DiagTools Basic Diagnostic Test.** Run the basic test of the e-DiagTools diagnostic program (page 3-22).

–and–

- **Function Tests.** Run tests that check the repaired function, such as in the e-DiagTools diagnostic program (page 3-22).

–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 PCCTest 450	DMI/TopTools (if installed)	BIOS Setup
<b>Bootup</b>		Tests		Describes	Configures
<b>Processor</b>	Tests (System menu)	Tests		Describes	
<b>Memory</b>	Tests (Memory menu)	Tests		Describes	Describes
<b>Batteries</b>		Tests (CMOS battery only)			
<b>Display</b>	Tests (Video menu)			Describes	
<b>Hard disk</b>	Tests (IDE menu)	Tests		Describes	Describes
<b>Floppy drive</b>	Tests (FDD menu)	Tests		Describes	Describes
<b>Keyboard</b>	Tests (KBD menu)	Tests		Describes	
<b>Pointing Devices</b>	Tests (Misc menu)			Describes	Configures
<b>Audio</b>	Tests (System, Misc menus)				
<b>Serial</b>	Tests* (Misc menu)			Describes	
<b>Parallel</b>	Tests* (Misc menu)			Describes	
<b>LAN</b>				Describes	
<b>Modem</b>	Tests** (User menu)				
<b>PS/2 port</b>	Tests† (KBD, Misc menus)				
<b>USB</b>	Tests† (USB menu)			Describes	
<b>PCMCIA</b>	Tests* † (Misc menu)		Tests		
<b>AC adapter</b>				Status	
<b>CD/DVD drive</b>	Tests (IDE menu)	Tests (with boot CD)		Describes	

\* The diagnostic test is more thorough if you use a loop-back connector.

\*\* 3Com modem only; the test checks only the internal hardware up to the mini-PCI PCA, and does not check the mini-PCI panel or any external cabling.

† Use an appropriate external device to exercise the port. See the help text for the tests in the menu.

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, check to see what replaceable modules are involved in the system function and what roles they play. See Figure 1-8 on page 1-15 and Table 1-7 on page 1-16.			
<b>Startup</b>			
Does not boot on AC or battery.	<p>Check the power source. Press the system-off switch to reset the notebook, then press the standby button to turn the notebook on.</p> <p>Unplug the AC adapter, remove the battery and any PC cards, then reconnect power and try again.</p> <p>Do not use the touch pad while booting or resuming.</p> <p>Remove the battery, AC adapter, and any PC cards. Plug in the AC adapter, reset the notebook using the system-off switch, then press the standby button to turn the notebook on.</p> <p>Remove all but one SDRAM module and try again. Reinsert any other SDRAM modules and try again.</p>	<p>AC adapter.</p> <p>SDRAM module.</p> <p>CPU module.</p> <p>Video PCA.</p> <p>Motherboard.</p> <p>Display assembly.</p> <p>Hard drive.</p>	<p>Check AC adapter. Remove any SDRAM modules and try again.</p> <p>If power status light does not turn on, 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 switchboard PCA; replace motherboard.</p> <p>If power status light and display turn on and BIOS completes, but OS does not start from hard disk or from floppy drive, replace CPU module, then motherboard. If OS starts from floppy drive, use <i>Recovery CDs</i> to reinstall factory software onto hard drive; replace hard drive.</p>
Beeps once, spins hard disk, repeats, but does not boot.		SDRAM module.	Make sure at least one SDRAM module is installed.
Does not boot on battery, but boots on AC.	<p>Make sure battery is properly installed and fully charged.</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>Make sure floppy drive is installed correctly.</p> <p>Use BIOS Setup to check boot order and make sure floppy drive controller (FDD) is enabled.</p>	<p>Floppy drive or contacts.</p> <p>Motherboard.</p>	
Does not boot from CD in CD/DVD drive.	<p>Make sure CD is bootable.</p> <p>Use BIOS Setup to check boot order.</p> <p>Restart notebook.</p>	<p>CD/DVD drive.</p> <p>Motherboard.</p>	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
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.
Sluggish startup or shutdown.	Check disk using Tools tab in disk's Properties sheet, and use Disk Defragmenter to optimize hard drive. Delete temporary and unneeded files.	Hard drive.	Use suggestions shown at left.
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/Battery</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.	
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.	
Notebook turns off immediately after turning on.	Battery is probably extremely low. Connect AC adapter or replace battery.	Battery.	
Battery does not charge.	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 down. Check for blocked air vents.	Battery or contacts. AC adapter. Motherboard. Heatsink assembly.	Check battery and AC adapter. Check heatsink assembly.
AC adapter does not power notebook.	Try another AC adapter, if available.	AC adapter. Motherboard.	AC adapter cannot be repaired, and must be replaced.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<p>Notebook has short operating time.</p>	<p>Turn down display brightness.</p> <p>Check timeout settings in Power Options in Control Panel.</p> <p>Restart computer, press F6 when HP logo appears, and follow onscreen instructions. This calibrates the battery, and requires four to five hours. You cannot use computer during this process.</p> <p>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.)</p> <p>When playing DVD movies on battery power, use Power Options in Control Panel to select Portable/Laptop power scheme.</p> <p>When using applications with automatic save feature (such as MS Word), extend save time or disable to reduce hard disk access and power usage.</p> <p>PCMCIA card use can affect battery life. Some PCMCIA cards draw power even while not in use.</p> <p>Heavy modem use can affect battery operating time.</p>	<p>Battery.</p> <p>Motherboard.</p>	<p>Battery capacity often decreases after a year or more.</p>
<p>Battery indicator is inaccurate.</p>	<p>Time Remaining is an estimate based on how much power the notebook is using at that moment. It therefore depends on the current task, and assumes power will be used at the same rate until the battery runs out. So, for example, if the notebook is performing a task requiring a good deal of power (such as reading from a CD or DVD), the value will probably show too little time remaining.</p>		



Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>Standby/resume</b>			
General problems.	Close all applications before going into (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.		
Notebook resumes slowly from standby.	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.	The computer won't suspend if it has an active connection to another computer.  If the computer is busy, it normally waits to finish the current operation before suspending.		
Does not automatically enter hibernate mode as expected.	Make sure hibernate support is enabled in Power Options in Control Panel. Also, make sure the hibernate timeouts (Power Schemes tab) for AC and battery power are not set to Never.		
COM port locks up after resuming.	When using fax software in auto-receive mode, disable auto-receive or exit fax software before putting notebook into (or allowing to enter) standby or hibernate mode. Otherwise, COM port will lock up on resuming, and will not work until notebook restarts.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>Display</b>			
Dark display, no light.	Make sure notebook is turned on and warmed up. Check power supply. Adjust display brightness. Press Fn+F5 several times. Make sure SDRAM modules are installed properly. Make sure display cable is connected to motherboard and switchboard PCA. Make sure video PCA is installed properly. Make sure CPU module is installed properly. Try external monitor.	Display cable connection. SDRAM modules. Video PCA. CPU module. Display assembly. Motherboard.	Set DIP switch on video PCA to match label on display (see page 2-20). Check cable connection. Replace SDRAM modules. Replace CPU module. Replace display assembly. If external monitor displays no image, replace motherboard.
White display.	Adjust display brightness.	Display assembly. Switchboard PCA.	
Erratic display.		Display cable connection. Video PCA. 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.
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. Check settings in BIOS Setup.	External display. Motherboard.	
Display difficult to read or part of desktop not visible.	Check display resolution (default is 1024 x 768). Use HP Desktop Zoom to adjust size of desktop icons and labels.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
TV display does not work properly after resuming from standby.	Use BIOS Setup to set Video Display Device to Auto.		
Cannot switch to TV display by pressing Fn+F5.	Fn+F5 switches only between internal LCD and external display connected to VGA port, and will not switch to TV display connected to TV output port.		
<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 drive 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 drive immediately. Check hard drive installation. Check for alternate noise sources, such as PCMCIA drive or fan.	Depends on source of noise.	
Files are corrupted.	Run virus scan program. Check disk using Tools tab in disk's Properties sheet. Back up files if possible, then use <i>Recovery CDs</i> to reformat hard disk and reinstall factory software.		Use suggestions shown at left.
Disk capacity is less than normal.	Check 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.	Use suggestions shown at left.
Disk's reported capacity is less than actual size.	Hard disk allocates space to diagnostic software. This space is unavailable for other uses, and not included hard disk capacity reported by Windows.		
<b>Floppy drive</b>			
General problems.	Make sure floppy drive is installed correctly. Check settings in BIOS Setup.	Floppy drive or contacts. Motherboard.	
Drive does not write to floppy disks.	Make sure floppy disk is not write-protected.	Floppy drive.	

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 may vary for other media.		
Cannot read any CD or DVD.	Restart the notebook. Make sure the CD/DVD drive is inserted 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 the 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, the last change is hard-coded on the DVD drive, and is permanent. Refer to the 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. Make sure CD/DVD drive is installed properly.	CD/DVD drive. Motherboard.	
DVD doesn't play with two displays.	Before starting DVD player, press Fn+F5 to switch to one display. You cannot switch displays once DVD player is started.  If using both displays, DVD image will not appear on any display set up as “secondary”. Open Display in Control Panel, click Advanced on Settings tab, and change settings.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Problems with display resolution or color when playing DVDs.	Set resolution or color depth before starting DVD player. You cannot change these once DVD player is started. Some combinations of color depth and resolution not supported in DVD playback. If needed, reduce color depth or display resolution.		
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.	Try reinserting ribbon cable in connector on motherboard.	Keyboard. Motherboard.	
External keyboard does not work.	Check connections.	External keyboard. Motherboard.	
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. Top case. Motherboard.	
<b>Touch pad</b>			
General problems.	Restart notebook. Slide and hold power switch four seconds to reset notebook. Avoid touching touch pad while booting or resuming. Check settings in Control Panel.	Top case. Motherboard.	
Click button does not work.		Top case. Motherboard.	
<b>Memory</b>			
Out of memory error.	Make sure C drive is not running out of free space. Use memory troubleshooter in Windows Help. Not all third-party memory cards have been tested for use with notebook. Check HP Notebook web site for list of approved memory cards.	SDRAM module.	
Memory doesn't increase after adding SDRAM.	Make sure SDRAM modules are installed properly.	SDRAM module.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<b>Mouse</b>			
External PS/2 mouse doesn't work.	Check connection. Put notebook in standby mode or turn it off before attaching mouse. Install all drivers included with mouse. Restart notebook.	Mouse. Top case. Motherboard.	
<b>Audio</b>			
No sound is audible.	Increase sound volume. Make sure sound is enabled (software controls). Check for sound resource conflicts in Device Manager. Sound may not operate properly in MS-DOS mode. Check speaker cable connection.	Top case. Motherboard.	Check operation using headphones or external speakers.
Built-in microphone does not record.	Check software controls for recording sound. Make sure switchboard PCA is connected properly.	Switchboard PCA. Top case. Motherboard.	Check operation using external microphone.
Feedback from speakers.	Reduce sound volume. In Volume Control, click Options, Properties, select Playback, and enable microphone. Then make sure microphone is muted.		
PC card detection beep at startup is loud and cannot be adjusted.	Download latest audio driver from technical support area of HP Notebook web site (see page vi).		
<b>Serial/Parallel/USB</b>			
General problems.	Check connections. Restart notebook. Check port settings in Device Manager. Check settings in Control Panel. Use troubleshooters in Windows Help. For USB: contact device vendor and HP Notebook web site (see page vi) for latest USB drivers. For USB: if the device is powered by the USB port, try the other port.	Series/parallel/USB device. Motherboard.	Use loop-back connector when testing serial or parallel port—see page 3-24.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Serial mouse doesn't work.	Check connection. Restart notebook. Check mouse and ports settings in Control Panel. Make sure mouse was installed according to manufacturer's instructions.	Mouse. Motherboard.	
Serial modem doesn't work.	See "Modem," below. Check connection. Check modem settings in Control Panel. Use modem troubleshooter in Windows Help. Disable internal modem in Device Manager.		
<b>Modem</b>			
Modem will not connect at 56K.	Verify that host modem supports 56K (V.90) connection speed. Try connecting later in case line quality or other external factor is cause of problem.		
Modem will not connect at any speed.	Make sure notebook's modem is properly connected to wall telephone jack. Check cables. Verify settings in Control Panel. Make sure parity, speed, word length, and stop bits match on sending and receiving modems. Restart notebook. Run Windows modem diagnostics or modem troubleshooter in Windows Help. Open Device Manager. If modem is disabled, enable it. If it has a conflict, try disabling another device. Use analog telephone line, not PBX or digital line. In a hotel, ask for data line. Try disabling error correction and data compression. Download latest modem driver from technical support area of HP notebook web site (see page vi).	Mini-PCI PCA. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Modem doesn't dial or no dial tone.	<p>Check all cables and connections.</p> <p>Connect a standard telephone to the phone line and make sure the line is working.</p> <p>Try another telephone line, preferably one used for a fax machine or modem.</p> <p>If you're in a foreign country, the dial tone may not be recognized by the modem. In Control Panel, disable option that waits for dial tone.</p> <p>Phone message recording services provided by phone companies use "broken dial tone" to indicate waiting message. This can prevent notebook from detecting dial tone.</p>	Mini-PCI PCA. Motherboard.	
Modem dials incorrectly.	<p>Check number you entered, including digits required for outside access or long distance.</p> <p>Check dialing options in Control Panel—look for duplicate digits for outside access or long distance.</p> <p>In foreign country, modem may not recognize dial tone. In Control Panel, disable option that waits for dial tone.</p> <p>Disable call-waiting.</p>		
Modem seems slow.	<p>Check for excess line noise or static (often difficult to eliminate on international calls). Contact telephone company if needed.</p> <p>Disable call-waiting.</p> <p>Eliminate extra connections in the line. If possible, connect directly to wall jack.</p> <p>Try another telephone line, preferably one used for a fax machine or modem.</p>	Mini-PCI PCA.	
Modem isn't detected.	<p>Check modem setup in Control Panel. Check COM port.</p> <p>Open Device Manager. If modem is disabled, enable it. If conflict exists, try disabling another device.</p> <p>If running fax software using fax Class 2, try Class 1.</p>	Mini-PCI PCA. Motherboard.	



Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Modem connects, but transferred data is bad.	Verify settings in Control Panel. Make sure parity, speed, word length, and stop bits match on sending and receiving modems. Disable error correction and data compression.	Mini-PCI PCA.	
Modem doesn't fax.	If using fax Class 2 in fax software, try Class 1. Close any other communications programs. If faxing by printing from application, make sure fax printer is selected. Turn off power management features temporarily.		
General problems.	If serial or PC card modem is not working, disable internal modem in Control Panel. Download latest modem driver from technical support area of HP Notebook web site (see page vi).	Mini-PCI PCA. Motherboard.	
<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 Panels.	Keyboard cover. Switchboard PCA. 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 Panels.		
<b>Printing</b>			
Serial or parallel printer doesn't print	Make sure printer is on. Make sure printer cable is securely attached at both ends. Make sure cable or cable adapter is appropriate for printer type. Use print troubleshooter in Windows Help.	Cable. 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 computer to another network station (if applicable).</p> <p>Try connecting cable to another computer or network station. 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>Check settings in Device Manager. If network adapter is disabled, enable it. If conflict exists, try disabling another device.</p> <p>Use networking troubleshooter in Windows Help.</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 m (330 ft).</p>	Mini-PCI PCA. Motherboard.	
Can't browse My Network Places.	<p>Check with network administrator to make sure network supports NetBEUI protocol.</p> <p>Use Windows Search to locate computer on network.</p>		
Can't log in to Netware servers.	If Netware server uses IPX/SPX protocol, may need to force frame type to match server's frame type. Check with network administrator.		
Computer stops responding after booting.	If using a TCP/IP network with no DHCP server, long delay can occur at startup because DHCP is enabled. Contact network administrator for proper TCP/IP configuration.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
<p><b>PC card</b></p> <p>Miscellaneous problems.</p>	<p>Remove and reinsert PC card.</p> <p>Restart notebook.</p> <p>Try card in other slot or in another computer.</p> <p>Check for conflicts or refresh device list in Device Manager. If card requires an IRQ, make sure one is available.</p> <p>Check HP Notebook web site for installation instructions and information about supported PC cards (page vi).</p> <p>Download current drivers from card manufacturer's web site.</p>	<p>PC card.</p> <p>PCMCIA socket.</p> <p>Motherboard.</p>	<p>Using a flashlight, look for bent pins inside PCMCIA socket.</p> <p>If both slots have problems,</p> <p>U, v 1M</p>

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Notebook gets abnormally hot.	<p>Always set notebook on a flat surface, so air can flow freely around and underneath.</p> <p>Make sure air vents are clear.</p> <p>Check heatsink installation.</p> <p>Games and other programs that drive CPU usage toward 100% can contribute, as can charging battery.</p>	Heatsink.	Check heatsink for proper fan operation or damage.
Notebook pauses or runs sluggishly.	<p>May be normal Windows behavior (background processing can affect response time).</p> <p>Certain background operations (such as virus scanning software) 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. If needed, use Power Options in Control Panels to change hard disk time-out to match standby time-out.</p> <p>Some file browsers respond slowly while processing graphics or waiting for broken network connections to time out.</p> <p>Check for overheating—see previous symptom.</p> <p>If notebook's hard disk drive runs frequently (as indicated by notebook's hard disk drive access light) while notebook appears to be paused or running slowly, consider installing additional SDRAM. For best performance with Windows XP, notebook should have a least 128 MB of SDRAM.</p> <p>Check available free disk space. Delete temporary and unneeded files.</p>	Heatsink. CPU module. Motherboard.	If notebook slows after period of continuous activity, check heatsink—see previous symptom.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Notebook still on but stops responding.	<p>Press Ctrl+Alt+Del and end any application not responding.</p> <p>Slide and hold power switch four seconds to turn off and reset notebook, then press blue standby button to turn notebook back on.</p> <p>If this fails, insert a straightened paper clip into system-off switch, then press blue standby button to turn notebook back on.</p>		

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# Diagnostic Tools

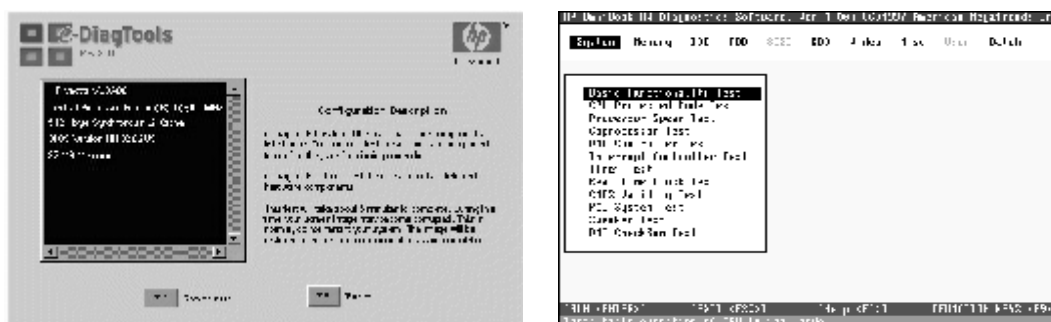
This section describes the following diagnostic tools you can use for troubleshooting and repairing the notebook:

- e-DiagTools diagnostic program (below).
- Power-on self-test (page 3-28).
- Sycard PCCtest 450 PC Card (page 3-31).
- Desktop Management Interface (page 3-32).
- BIOS Setup utility (page 3-33).

## e-DiagTools Diagnostic Program

The e-DiagTools hardware diagnostic program provides two levels of testing:

- Basic user-level hardware test.
- Advanced individual hardware tests.



**Figure 3-2. e-DiagTools Screens — Basic and Advanced**

The tests are designed to run after the system restarts, 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 restarts when you exit the program so drivers can be loaded.

### Updating e-DiagTools

You can download the latest version of e-DiagTools from the HP Notebook web site (see page vi). Follow the instructions included with the new version.

## Running e-DiagTools

1. Restart the notebook.
2. When the HP logo appears, press F10 to start the diagnostic test.
3. When the menu appears, press Enter to run e-DiagTools.
4. The first time you run the program, you are prompted to select the language for the program.
5. Press F2 to proceed with the basic tests.

You can also proceed directly to the advanced tests from this point by pressing Ctrl-F9 (in which case skip to step 10, below).

6. When the hardware detection finishes, check the list of detected hardware.

### Note

If a device is not detected or fails its test, it might be configured incorrectly in BIOS Setup. You can confirm this by running BIOS Setup and checking the settings—see “BIOS Setup Utility” on page 3-33.

7. **Run the basic test.** Press F2 to start the basic hardware test.

If the basic test fails, you can press F6 and start a Wizard that runs a set of advanced tests for the failed component. Then generate a support ticket.

8. To exit without running the advanced tests, press F4 to view the Support Ticket. Press F3 to exit.

9. **Optional: Run the advanced tests.** Press F2 to open the advanced test screen.

10. Select and run the appropriate tests. Note that individual tests do not appear if the hardware they test is not detected. Press the following keys to run tests:

Enter	Runs the highlighted test.
F5 or Space	Marks/unmarks the highlighted test.
F6	Marks/unmarks all tests in the current menu.
F7	Marks/unmarks all tests in all menus.
F10	Runs all marked tests.

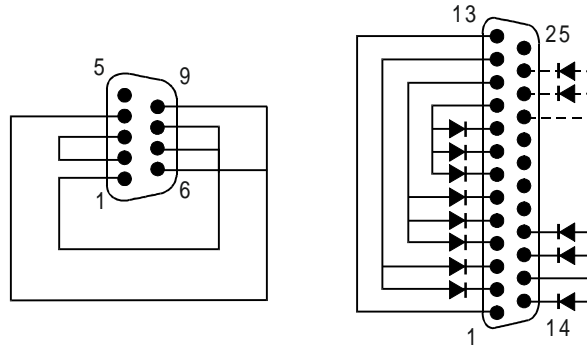
(Press F9 for a list of all function keys.)

If a test fails, the error code and description are logged, and the error code is displayed temporarily. If several errors occur, look for patterns that might indicate a common cause. See Table 3-3 on page 3-25 for repair suggestions. Consider these suggestions in combination with other troubleshooting information.

11. **Save the Support Ticket.** Press T to update and display a Support Ticket containing system and test information.
12. When you are finished running tests, press Esc to exit the advanced tests.
13. **Optional:** To save the Support Ticket to a floppy disk, press F7 then Alt+C.
14. **Exit.** Press F3 and then any key to exit and restart the notebook.

15. **Optional: Open the Support Ticket.** In Windows, click Start, Programs (or All Programs), HP e-DiagTools, e-DiagTools for Windows.
16. Click View to display the Support Ticket.
17. To add information about the problem, click Comments and type the information, then click OK.  
To save or print the Support Ticket, click Save As or Print.

Note that the serial and parallel port tests are more thorough if you connect a loop-back connector to the port before running the test for that port. See the wiring diagrams below.



**Figure 3-3. Serial and Parallel Loopback Connectors**



## Interpreting the Results

The following table lists test groups, error codes, and suggestions for follow-up actions. Consider these suggestions in combination with other troubleshooting information.

**Table 3-3. e-DiagTools Error Codes**

Code	Suggestions	Code	Suggestions
<b>System Tests</b>		020Ah – 0211h	Repeat the test. Run Windows disk-checking tools. Replace the hard disk.
0001h – 0008h	Make sure the CPU module is seated properly. Replace the CPU module.	0220h	Replace the motherboard.
0009h	Replace the CPU module. Replace the motherboard.	0240h	Replace the hard disk. Replace the motherboard.
0010h – 0016h	Make sure the CPU module is seated properly. Replace the CPU module.	0252h – 0254h	Repeat the test. Replace the hard disk.
001Eh – 002Fh	Make sure the CPU module is seated properly. Replace the CPU module. Replace the motherboard.	025Ah – 0260h	Repeat the test. Run Windows disk-checking tools. Replace the hard disk.
0030h – 0032h	Replace the motherboard.	0265h	Check hard disk connection. Replace the hard disk. Replace the motherboard.
0040h	Replace the motherboard.	0275h	Replace the hard disk.
0041h	Use the Device Manager to check IRQ assignments for all devices.	0280h	Check hard disk connection. Replace the hard disk. Replace the motherboard.
0050h – 0070h	Replace the motherboard.	0281h	Replace the hard disk.
0071h – 0076h	Reset the notebook, then run BIOS Setup and verify settings. Replace the motherboard.	0290h	Repeat the test. Replace the hard disk.
0077h	Replace the motherboard.	0293h – 0296h	Replace the hard disk.
0078h	Reset the notebook, then run BIOS Setup and verify settings. Replace the motherboard.	02AAh	Check hard disk connection. Replace the hard disk. Replace the motherboard.
0079h – 008Ah	Replace the motherboard.	02CCh	Repeat the test. Run BIOS Setup and check the hard disk type. Replace the hard disk. Replace the motherboard.
00C0h – 00CCh	Replace the CPU module.	02EEh	Reset the notebook. Use BIOS Setup to return all settings to default values. Replace the hard disk.
<b>Memory Tests</b>		02F1h	Use the <i>Recovery CDs</i> to reformat the hard disk and reinstall factory software.
The addresses below are absolute (32-bit) addresses, and are not in the segment:offset format.		02F3h	Run Windows disk-checking tools. Use the <i>Recovery CDs</i> to reformat the hard disk and reinstall factory software.
0100h – 0160h	Check the installation of the SDRAM modules. Replace the SDRAM modules (each 01000000h represents 16 MB). Replace the motherboard. Replace the CPU.	02F4h – 02F5h	Use the <i>Recovery CDs</i> to reformat the hard disk and reinstall factory software.
0182h	Unload HIMEM.SYS or any programs using the extended memory allocated by HIMEM.SYS.	02FFh	Check the hard disk connection. Replace the hard disk. Replace the motherboard.
0183h – 0190h	Check the installation of the SDRAM modules. Replace the SDRAM modules (each 01000000h represents 16 MB). Replace the motherboard. Replace the CPU.	9602h – 9607h	(See Hard Disk Tests at end of table.)
01A0h – 01B3h	Replace the CPU. Replace the motherboard.	<b>Floppy Disk Tests</b>	
<b>Hard Disk Tests</b>		0301h – 0304h	Replace the floppy drive. Replace the motherboard.
0201h	Replace the hard disk. Replace the motherboard.	0305h	Run the Floppy Disk Controller test. Make sure the floppy diskette is fully inserted in the drive. Make sure the drive is properly installed. Replace the diskette. Replace the floppy drive. Replace the motherboard.
0202h – 0204h	Check test parameters and repeat the test. Replace the hard disk.	0306h	Replace the floppy drive.
0205h	Replace the motherboard.	0307h – 030Bh	Run the Floppy Disk Controller test. Make sure the floppy diskette is fully inserted in the drive. Make sure the drive is properly installed. Replace the diskette. Replace the floppy drive. Replace the motherboard.
0207h	Run BIOS Setup and check the hard disk type. Check the hard disk connection. Replace the hard disk. Replace the motherboard.	030Ch	Replace the floppy drive.
0208h – 0209h	Repeat the test.		

Code	Suggestions
<b>Keyboard Tests</b>	
0400h – 0401h	Replace the motherboard.
0410h – 0414h	Check the keyboard ribbon cable connection. Replace the keyboard. Replace the motherboard.
0415h	Replace the keyboard. Replace the switchboard PCA. Replace the motherboard.
0416h – 0418h	Replace the keyboard. Replace the motherboard.
900Fh	Replace the switchboard PCA. Replace the motherboard.
901Ch	Replace the keyboard. Replace the motherboard.
901Dh	Replace the CD player PCA. Replace the motherboard.
<b>Serial Port Tests</b>	
0601h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0602h	Replace the motherboard.
0603h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0604h – 0605h	Replace the motherboard.
0606h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0607h	Make sure the loopback connector is installed and constructed properly. Replace the motherboard.
0608h – 0619h	Replace the motherboard.
<b>Parallel Port Tests</b>	
0701h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0702h	Replace the motherboard.
0704h – 0706h	Replace the motherboard.
0707h	Connect the loopback connector.
0708h – 0709h	Replace the motherboard.
<b>Audio Tests</b>	
0801h – 0804h	Check the speaker connection. Replace the top case. Replace the motherboard.
0806h – 0816h	If external speakers are being used, make sure the speakers are properly connected. Rerun the test. Replace the speakers that fail this test repeatedly.
08C0h – 08C2h	Check the speaker connections. Replace the top case. Replace the motherboard.
08D0h – 08F3h	Replace the motherboard.

Code	Suggestions
<b>Video Tests</b>	
0900h – 0905h	Replace the video PCA. Replace the motherboard.
0911h	If this test fails on the internal display, replace the video PCA. Replace the motherboard.
0912h – 0933h	Replace the video PCA. Replace the motherboard.
2100h – 2102h	Replace the display assembly. Replace the video PCA. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
2110h – 2120h	Replace the video PCA. Replace the motherboard. Replace the display assembly.
2130h	Replace the display assembly. Replace the video PCA. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
2140h – 2141h	Replace the video PCA. Replace the motherboard. Replace the display assembly.
2150h	Replace the display assembly. Replace the video PCA. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
9016h	Reset the notebook. Replace the motherboard.
9017h	See page 5-2 for cosmetic guidelines. If warranted, replace the display assembly.
<b>CD Tests</b>	
0A00h	Insert a CD in the drive.
0A01h	Repeat the test. Replace the CD drive.
0A02h	No repair. (Automatic close not supported.)
0A03h	Insert a different CD in the drive and repeat the test. Make sure the CD drive is installed properly. Replace the CD drive. Replace the motherboard.
0A04h	Insert a data CD in the drive and repeat the test.
0A05h	Insert a different CD in the drive and repeat the test. Make sure the CD drive is installed properly. Replace the CD drive. Replace the motherboard.
0A06h	Insert a data CD in the drive and repeat the test. Replace the drive.
0A07h	Repeat the test. Replace the drive.
0A08h	Insert an audio CD and repeat the test. Replace the drive.
0A09h	Repeat the test. Replace the drive.
0A10h – 0A11h	Insert an audio CD and repeat the test. Replace the drive.
0A12h	Insert a different multisession CD and repeat the test. Replace the drive.
<b>SMBUS Tests</b>	
0E00h – 0E20h	Replace the motherboard.

Code	Suggestions
<b>TI CardBus Tests</b>	
1201h	Remove any mini-PCI PCA and repeat the test.
1202h – 1203h	Replace the motherboard.
1205h – 1206h	Insert a different PC Card and repeat the test. Replace the PCMCIA socket. Replace the motherboard.
1207h	Reset the notebook. Replace the motherboard.
<b>USB Tests</b>	
1301h – 1316h	Replace the motherboard.
9006h	(See USB Port Test below.)
<b>ACPI Tests</b>	
1701h – 1702h	Replace the motherboard.
<b>DVD Tests</b>	
1900h – 1904h	Insert a different DVD in the drive and repeat the test. Replace the DVD drive.
1905h	Make sure the DVD Drive region and DVD Media region match. If the region is not set for the drive, use an unencrypted DVD.
<b>LAN/Modem Tests (3Com modem only)</b>	
8000h	Repeat the test with the LAN cable/phone line unplugged. Replace the cable/phone line. Check the connections. Replace the mini-PCI PCA. Replace the motherboard.  Note: the test checks only the internal hardware up to the mini-PCI PCA, and does not check the mini-PCI panel or external cabling.
<b>Fan Tests</b>	
9001h	If the fan is already running, you may not hear a change. Check the heatsink connection. Replace the heatsink. Replace the motherboard.
9002h	Reset the notebook. Replace the motherboard.

## Power-On Self-Test

### Note

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

The POST (power-on self-test) is a series of initialization routines and diagnostic tests that the system BIOS runs when the notebook boots. The system BIOS will not boot the operating system if system memory, the CPU, DMA, or the interrupt controller fails the POST diagnostic tests. POST progress is indicated by a sequence of codes, and error messages are displayed if possible.

You should not necessarily interpret the failure of one or more POST tests as a hardware, software, or firmware failure. If an error message appears, *confirm the problem using other diagnostic tools*. Not all POST messages indicate a hardware, software, or firmware failure—some messages are for information only.

First, confirm the failure by performing a “clean” boot: If the computer fails to restart with a clean boot, it requires repair.

1. Remove all accessories, including SDRAM modules, 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 system-off switch to return the notebook to a known state.

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

**Table 3-4. POST Terminal-Error Beep Codes**

Beep Codes*	POST Description
1	One short beep before boot.
1-2	Search for option ROMs.
1-2-2-3	BIOS ROM checksum.
1-3-1-1	Test DRAM refresh.
1-3-1-3	Test NS87570 Keyboard Controller (part of motherboard).
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.
1-4-1-1	RAM failure on data bits xxxx of high byte of memory bus.
2-1-2-3	Check ROM copyright notice.
2-2-3-1	Test for unexpected interrupts.
1 long-2 short	Improper video configuration (check video PCA DIP switches, replace video PCA) or external ROM checksum failure.
1 long-5 short	Display DIP switches and EEPROM settings do not match (check DIP switch settings).
* Up to four groups of short beeps, except as noted.	

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 3-5. POST Messages**

Message	Description
<b>0200 Failure Fixed Disk</b>	The hard disk is not working or not configured properly. Make sure the disk is installed properly. Use BIOS Setup to make sure the hard disk type is correctly identified.
<b>0210 Stuck key</b>	A key is stuck on the keyboard.
<b>0211 Keyboard error</b>	The keyboard is not working.
<b>0212 Keyboard Controller Failed</b>	The keyboard controller failed its test. The motherboard may need to be replaced (it 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>	The 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>	The CMOS clock battery indicator shows that the battery is dead. Connect the AC adapter for at least 24 hours. Replace the motherboard.
<b>0251 System CMOS checksum bad – Default configuration used</b>	System CMOS has been corrupted or modified incorrectly, perhaps by an application that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter BIOS Setup and enter your own values. 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>	The timer test failed. Replace the motherboard.
<b>0270 Real time clock error</b>	The real-time clock failed the BIOS test. The motherboard may need to be replaced.
<b>0280 Previous boot incomplete – Default configuration used</b>	The previous POST did not complete successfully. POST loads default values and offers to run BIOS Setup. If 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>	The memory size found by POST differed from CMOS.
<b>02B0 Diskette drive A error</b> <b>02B1 Diskette drive B error</b>	Drive A: or B: is present but fails the BIOS POST diskette tests. Make sure the drive is installed properly and defined with the proper diskette type in BIOS Setup.
<b>02B2 Incorrect Drive A type – run SETUP</b>	The type of floppy drive A: is not correctly identified in BIOS Setup.
<b>02B3 Incorrect Drive B type – run SETUP</b>	The type of floppy drive B: is not correctly identified in BIOS Setup.
<b>02D0 System cache error – Cache disabled</b>	The RAM cache failed and BIOS disabled the cache. The CPU may need to be replaced. A disabled cache slows system performance considerably.
<b>02F0: CPU ID:</b>	CPU socket number for Multi-Processor error.
<b>02F4: EISA CMOS not writeable</b>	ServerBIOS2 test error: Cannot write to EISA CMOS.

Message	Description
<b>02F5: DMA Test Failed</b>	ServerBIOS2 test error: Cannot write to extended DMA (Direct Memory Access) registers.
<b>02F6: Software NMI Failed</b>	ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).
<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 specified device.
<b>Allocation Error for: device</b>	Resolve the resource conflict for the specified device.
<b>CD ROM Drive</b>	CD ROM Drive identified.
<b>Entering SETUP ...</b>	Starting the BIOS Setup program.
<b>Failing Bits: nnnn</b>	The hex number <i>nnnn</i> is a map of the bits at the RAM address that failed the memory test. Each 1 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>	An I/O device has an IRQ conflict.
<b>PS/2 Mouse Boot Summary Screen:</b>	A PS/2 mouse is installed.
<b>nnnn kB Extended RAM Passed</b>	Where <i>nnnn</i> is the amount (in KB) of SDRAM successfully tested.
<b>nnnn Cache SRAM Passed</b>	Where <i>nnnn</i> is the amount (in KB) of system cache successfully tested.
<b>nnnn kB Shadow RAM Passed</b>	Where <i>nnnn</i> is the amount (in KB) of shadow RAM successfully tested.
<b>nnnn kB System RAM Passed</b>	Where <i>nnnn</i> is the amount (in KB) of system RAM successfully tested.
<b>Operating system not found</b>	No operating system was found 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>	A parity error was found in the system bus. (Parity is a method for checking errors in binary data: a parity error indicates that some data has been corrupted.) The BIOS attempts to locate the address and display it on the screen, and otherwise displays ????.
<b>Parity Check 2 nnnn</b>	A parity error was found in the I/O bus. The BIOS attempts to locate the address and display it on the screen, and otherwise displays ????.
<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 resume 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>	A PS/2 mouse was identified.
<b>System BIOS shadowed</b>	System BIOS was copied to shadow RAM.
<b>UMB upper limit segment address: nnnn</b>	Displays the address <i>nnnn</i> of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS that can be reclaimed by a virtual memory manager.
<b>Video BIOS shadowed</b>	Video BIOS was copied to shadow RAM.

## Sycard PCCtest 450/460 CardBus Card (Optional)

The PCCtest 450 and 460 CardBus Cards (version 1.05) available from Sycard Technology are the only recommended diagnostic tool that tests the functionality of the PCMCIA slots using a PCMCIA card. Each is a Type II PC Card that works with compatible 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 test software disk. (Software updates are available at the Sycard Technology web site: <http://www.sycard.com>.)
- Configuration headers (PC Card/16-bit and CardBus/32-bit) that attach to the card.

In addition, you will need this:

- CardBus extender card (such as the Sycard PCCextend 70) to avoid wear on the Sycard PCMCIA connector.

The Sycard PCCtest 450 and 460 provide the following tests. See the Sycard documentation for details about running the tests.

**Table 3-6. Sycard PCCtest Commands**

	Slot	PCMCIA PC Card (16-bit) test (PC Card configuration header)	CardBus (32-bit) test (CardBus configuration header)
<b>XE3/N5000 (technology codes GE and GD)</b>	Upper	PCT450 -1 -v -b75	TESTCB -1 -v -b75
	Lower	PCT450 -0 -v -b75	TESTCB -0 -v -b75

## Desktop and Windows Management Interfaces (DMI/WMI)

### Note

HP TopTools are not supported on Pavilion models.

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

### Installing the DMI Package

The DMI package is either preinstalled on the computer'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. Install the package as follows.

#### To install the DMI/WMI preloaded on the hard disk:

- In Windows, click Start, All Programs, HP TopTools for Notebooks, Setup.

#### To install the DMI from the *Recovery CDs* or from floppy disks:

1. Insert *Recovery CD* disk 1 into the CD/DVD drive, or insert floppy disk #1 into the floppy drive.
2. Select and run the SETUP program from the dmi\disk1 directory on the CD (under \hp\drivers), or from floppy disk #1.

### Using DMI/WMI

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

- A README.TXT file: click Start, All Programs, HP TopTools for Notebooks, Read me.
- A Windows online help file describing Hewlett-Packard's implementation of DMI (group and attribute definitions): click Start, All Programs, HP TopTools, HP TopTools Help.

### Uninstalling the DMI Package

1. Click Start, All Programs, HP TopTools for Notebooks, Uninstall WMI.
2. Restart the notebook.



## BIOS Setup Utility

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

### Running the BIOS Setup Utility

1. Restart the computer.
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 again, and marks the conflicting settings.

**Table 3-7. BIOS Setup Menus and Parameters**

Omnibook XE3: Settings for BIOS version GE.M1.02 (Autumn 2001).		
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 mm/dd/yy format.	
Floppy Drive	Sets the floppy drive type.	Detected and set automatically
Internal Hard Disk	Sets the hard disk drive size.	Detected and set automatically
Quiet Boot	When enabled, hides summary of power-on self-test and messages during boot.	Enabled
Video Display Device	Sets whether the notebook automatically switches to an external display if one is detected (Auto), or uses both the built-in and external displays (Both).	Auto
Video Expansion	When enabled, the video image covers the entire display in lower resolution modes. When disabled, the video image is centered in the display.	Disabled
Television Type	NTSC or PAL standard.	NTSC
System Memory	Shows the system memory size.	Detected automatically
Extended Memory	Shows the extended memory size.	Detected automatically
CPU Serial Number (on selected models)	When enabled, makes Intel CPU serial number available to software.	Enabled

<b>System Devices Menu</b>	<b>Description</b>	<b>Default</b>
PS/2 Pointing Devices	Enables (Both) or disables (Auto) the internal pointing devices when an external PS/2 mouse is connected.	Auto
External Fn Key	<b>Not on all models.</b> Sets whether left Ctrl+left Alt on an external keyboard is interpreted as the Fn key.	Enabled
IDE Controller (selected models)	Enables the primary channel (Primary), primary and secondary channel (Both), or neither (Disabled).	Both
FDD Controller	Enables the floppy drive.	Enabled
LCD Status Panel Display	Enables display on the status panel.	Enabled
LCD Status Panel Date Format	Sets the date format used in the status panel.	mm/dd/yy
LCD Status Panel Time Format	Sets the time format used in the status panel.	hh:mm AM/PM (24-hour format)
<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 administrator password must be set first.) The password can have no more than 8 characters (0–9, A–Z), and cannot include special or accented characters.	Enter
Set Supervisor 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 notebook boots. Requires the administrator password for changes.	Enabled
<b>Boot Menu</b>	<b>Description</b>	<b>Default</b>
	Shows the order of boot devices. Use the F5 and F6 keys to change the order.	1. Hard Drive 2. Floppy Disk 3. CD-ROM/DVD Drive
<b>Exit Menu</b>	<b>Description</b>	
Saving Changes and Exit	Saves Setup changes to CMOS, then exits and reboots.	
Discarding Changes and Exit	Discards any Setup changes made since last save, then exits and reboots. Does not affect security, date, or time changes.	
Get Default Values	Restores default settings, and remains in Setup. Does not affect security, date, or time changes.	
Load Previous Values	Discards any Setup changes made since last save, and remains in Setup. Does not affect security, date, or time changes.	
Save Changes	Saves Setup changes to CMOS, and remains in Setup. Security settings are saved when changed.	

## Updating the Notebook's BIOS

Hewlett-Packard may from time to time provide updates to the notebook's BIOS. Use e-DiagTools for Windows to download and install BIOS these updates as needed.

### **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 PC 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), 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 is completed, reset the system: insert a pin or straightened paper clip into the recess on the left side of the computer, underneath the PC card eject buttons.

BIOS updates are also available from the HP Customer Care web site ([www.hp.com/go/support](http://www.hp.com/go/support)).



## Replaceable Parts

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This chapter contains an exploded view of the notebook, and the following lists of parts:

- Replaceable parts for technology code GE (page 4-3) and technology code GD (page 4-5).
- Accessory replaceable parts (page 4-7).
- Part number reference (page 4-8).

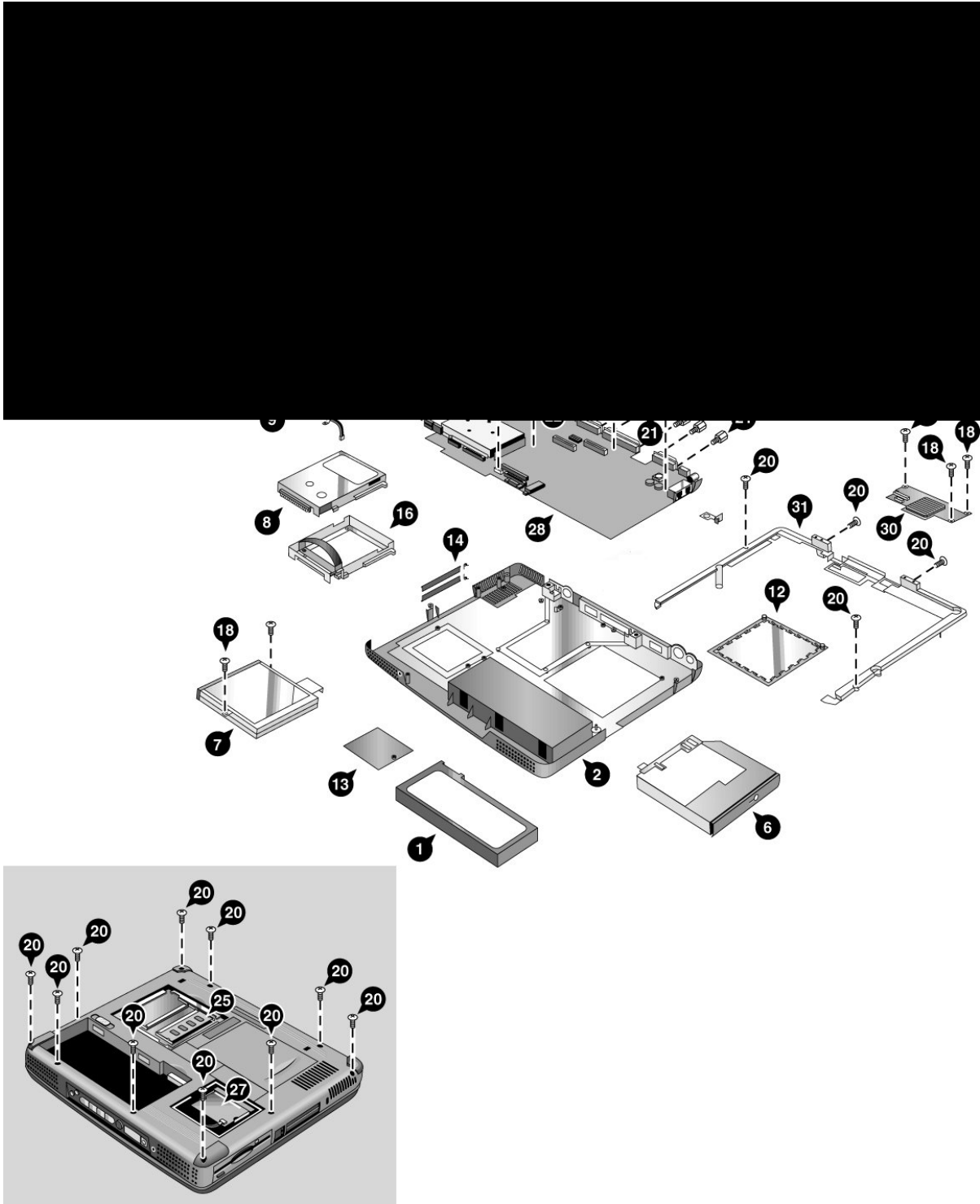


Figure 4-1. Exploded View

**Table 4-1. Replaceable Parts for Technology Code GE Models**

	Description	Part Number	Exchange Part Number	User-Repl.
1	Battery, Li-Ion (6-cell)	F3925-60902		Yes
1	Battery, Li-Ion (9-cell)	F3925-60901		Yes
1	Battery, NiMH	F3925-60903		Yes
2	Case, bottom	F3925-60960		No
3	Case, top (defeated)	F3925-60922		No
3	Case, top (full-featured)	F3925-60923		No
4	Cover, keyboard	F3925-60915		No
5	Display, 14.1-in	F3925-60904	F3925-69004	No
5	Display, 15-in	F3925-60905	F3925-69005	No
5	Display, 15.0-in SXGA+	F3925-60908	F3925-69008	No
6	Drive, CD	F3925-60936		No
6	Drive, CD-RW (8x)	F3925-60937		No
6	Drive, DVD	F3925-60938		No
6	Drive, DVD/CD-RW Combo	F3925-60939		No
7	Drive, floppy disk	F3925-60935		No
8	Drive, hard disk (10 GB, 9.5 mm, Hitachi)	F1664-60902	F1664-69002	No
8	Drive, hard disk (10 GB, 9.5 mm, Hitachi)	F2072-60908	F2072-69108	No
8	Drive, hard disk (10 GB, 9.5 mm, IBM DJSA-210)	F1660-60912	F1660-69112	No
8	Drive, hard disk (20 GB, 9.5 mm, Hitachi)	F2072-60913	F2072-69113	No
8	Drive, hard disk (20 GB, 9.5 mm, IBM [Diablo] ATA100)	F1660-60914	F1660-69114	No
8	Drive, hard disk (30 GB, 9.5 mm, Toshiba ATA66)	F2332-60903	F2332-69003	No
9	Heatsink assembly (with fan)	F2111-60949		No
10	Keyboard, French	F2111-60917		No
10	Keyboard, Japanese	F2111-60935		No
10	Keyboard, Spanish	F2111-60919		No
10	Keyboard, U.K. English	F2111-60916		No
10	Keyboard, U.S. English	F2111-60915		No
	Kit, base labels (XE3—includes rating label, safety label, business card holder, barcode overlay)	F3925-60965		No
	Kit, cables (includes modem cable, LAN cable, audio cable, and headphone PCA)	F2330-60916		No
	Kit, covers	F3925-60921		Yes
12	Cover, SDRAM	(see above kit)		Yes
13	Cover, mini-PCI	(see above kit)		Yes
14	Doors, PCMCIA (with springs)	(see above kit)		Yes
15	Module, CPU (AMD Athlon, 1.1 GHz)	1822-0582	F3930-69101	No
15	Module, CPU (AMD Athlon, 1 GHz)	1822-0259	F2409-69104	No
15	Module, CPU (AMD Athlon, 950 MHz)	1822-0258	F3928-69101	No
15	Module, CPU (AMD Athlon, 900 MHz)	1822-0257	F2409-69103	No
15	Module, CPU (AMD Duron, 900 MHz)	1822-0580	F3931-69101	No
16	Kit, hard disk drive carrier (includes bracket, strap, connector, mounting screws)	F2111-60956		No
	Kit, LCD screw covers (includes covers for all display sizes)	F3925-60975		Yes

	Description	Part Number	Exchange Part Number	User-Repl.
	Kit, screws (includes all screws needed to replace all notebook FRUs)	F3925-60976		No
18	Screw, M2.5x4 mm	(see above kit)		No
19	Screw, M2.5x5 mm	(see above kit)		No
20	Screw, M2.5x8 mm	(see above kit)		No
21	Standoff screw, 5 mm	(see above kit)		No
22	Heatsink standoff screw, 5 mm	(see above kit)		No
23	CD player PCA standoff screw, 5 mm	(see above kit)		No
24	Screw, M2.5x8 mm, flanged	(see above kit)		
25	Module, SDRAM, 128 MB, PC133 SODIMM	1818-8504		Yes
25	Module, SDRAM, 256 MB, PC133 SODIMM	1818-8635		Yes
26	PCA, CD player	F2111-60946		No
27	PCA, mini-PCI (LAN/modem)	F2409-60907		Yes
27	PCA, mini-PCI (LAN/modem) Malaysia	F2409-60908		Yes
27	PCA, mini-PCI (modem)	F2409-60909		Yes
27	PCA, mini-PCI (modem) Malaysia	F2409-60910		Yes
28	PCA, motherboard (full featured)	F3925-60950	F3925-69050	No
28	PCA, motherboard (defeated)	F3925-60967	F3925-69067	No
29	PCA, switchboard	F2111-60941		No
30	PCA, video	F2330-60911		No
30	PCA, video, SXGA+	F2409-60912		No
31	Set, hinge saddle	F2330-60910		No
	Set, thermal pad	F2111-60951		No
32	Socket, PCMCIA (2-slot)	F2111-60960		No



**Table 4-2. Replaceable Parts for Technology Code GD Models**

	Description	Part Number	Exchange Part Number	User-Repl.
1	Battery, Li-Ion (9-cell)	F2111-60901		Yes
2	Case, bottom	F2330-60914		No
3	Case, top (defeated)	F2300-60903		No
3	Case, top (full-featured)	F2111-60947		No
4	Cover, keyboard	F2111-60939		No
5	Display, 13.3-in (cole gray)	F2111-60980	F2111-69080	No
5	Display, 13.3-in (silver)	F2330-60906	F2330-69006	No
5	Display, 14.1-in (cole gray)	F2111-60911	F2111-69011	No
5	Display, 14.1-in (silver)	F2330-60904	F2330-69004	No
5	Display, 14.1-in (blue)	F2300-60912	F2300-69012	No
5	Display, 15-in (cole gray)	F2111-60913	F2111-69013	No
5	Display, 15-in (silver)	F2330-60905	F2330-69005	No
5	Display, 15-in (blue)	F2300-60917	F2300-69017	No
6	Drive, CD	F2111-60954		No
6	Drive, CD-RW (4x)	F2300-60904		No
6	Drive, CD-RW (8x)	F2300-60918		No
6	Drive, DVD	F2111-60955		No
6	Drive, DVD/CD-RW Combo	F2300-60905		No
7	Drive, floppy disk	F2111-60953		No
8	Drive, hard disk (20 GB, 9.5 mm, Hitachi)	F2072-60913	F2072-69113	No
8	Drive, hard disk (20 GB, 9.5 mm, IBM [Diablo] ATA100)	F1660-60914	F1660-69114	No
8	Drive, hard disk (30 GB, 9.5 mm, Toshiba ATA66)	F2332-60903	F2332-69003	No
9	Heatsink assembly (with fan)	F2111-60949		No
10	Keyboard, French	F2111-60917		No
10	Keyboard, Japanese	F2111-60935		No
10	Keyboard, Spanish	F2111-60919		No
10	Keyboard, U.K. English	F2111-60916		No
10	Keyboard, U.S. English	F2111-60915		No
	Kit, base labels (XE3—includes rating label, safety label, business card holder, barcode overlay)	F2111-60968		No
	Kit, base labels Pavilion—includes rating label, safety label, business card holder, barcode overlay)	F2111-60969		No
	Kit, cables (includes modem cable, LAN cable, audio cable, and headphone PCA)	F2330-60916		No
	Kit, covers	F2330-60909		Yes
12	Cover, SDRAM	(see above kit)		Yes
13	Cover, mini-PCI	(see above kit)		Yes
14	Doors, PCMCIA (with springs)	(see above kit)		Yes
15	Module, CPU (AMD Athlon, 1 GHz)	1822-0259	F2409-69104	No
15	Module, CPU (AMD Athlon, 900 MHz)	1822-0257	F2409-69103	No
15	Module, CPU (AMD Duron, 850 MHz)	1822-0497	F2410-69102	No
15	Module, CPU (AMD Duron, 800 MHz)	1822-0528	F2410-69101	No
16	Kit, hard disk drive carrier (includes bracket, strap, connector, mounting screws)	F2111-60956		No

	Description	Part Number	Exchange Part Number	User-Repl.
	Kit, LCD screw covers (includes covers for all display sizes)	F2111-60914		Yes
	Kit, screws (includes all screws needed to replace all notebook FRUs)	F2111-60972		No
18	Screw, M2.5x4 mm	(see above kit)		No
19	Screw, M2.5x5 mm	(see above kit)		No
20	Screw, M2.5x8 mm	(see above kit)		No
21	Standoff screw, 5 mm	(see above kit)		No
22	Heatsink standoff screw, 5 mm	(see above kit)		No
23	CD player PCA standoff screw, 5 mm	(see above kit)		No
24	Screw, M2.5x8 mm, flanged	(see above kit)		
25	Module, SDRAM, 128 MB, PC133 SODIMM	1818-8504		Yes
25	Module, SDRAM, 256 MB, PC133 SODIMM	1818-8635		Yes
26	PCA, CD player	F2111-60946		No
	PCA, display inverter, 13.3-in TFT	F2330-60925		No
	PCA, display inverter, 14.1-in TFT	F2330-60926		No
	PCA, display inverter, 15.0-in TFT	F2330-60927		No
27	PCA, mini-PCI (LAN/modem)	F2409-60907		Yes
27	PCA, mini-PCI (LAN/modem) Malaysia	F2409-60908		Yes
27	PCA, mini-PCI (modem)	F2409-60909		Yes
27	PCA, mini-PCI (modem) Malaysia	F2409-60910		Yes
28	PCA, motherboard AMD H2.1 (modem/LAN)	F2409-60903	F2409-69003	No
28	PCA, motherboard AMD H2.1/defeatured (modem/LAN)	F2409-60904	F2409-69004	No
28	PCA, motherboard AMD H2.1 (modem only)	F2409-60905	F2409-69005	No
28	PCA, motherboard AMD H2.1/defeatured (modem only)	F2409-60906	F2409-69006	No
29	PCA, switchboard	F2111-60941		No
30	PCA, video	F2330-60911		No
31	Set, hinge saddle	F2330-60910		No
	Set, thermal pad	F2111-60951		No
32	Socket, PCMCIA (2-slot)	F2111-60960		No

**Table 4-3. Accessory Replaceable Parts**

<b>Description</b>	<b>Part Number</b>	<b>Exchange Part Number</b>	<b>User Repl.</b>
AC adapter, auto (72-watt, Europe only)	F2297-80001		Yes
Adapter, PS/2 "Y" (F1469A)	F1469-80001		Yes
Auto/airline AC adapter (75-watt)	F1455-80003		Yes
Power cord, replacement (Australia/New Zealand)	8120-6312		Yes
Power cord, replacement (U.S./Canada/Taiwan/Mexico/Philippines)	8120-6313		Yes
Power cord, replacement (Europe/Israel/Egypt/Saudi Arabia)	8120-6314		Yes
Power cord, replacement (Japan)	8120-6316		Yes
Power cord, replacement (India)	8121-0702		Yes
Power cord, replacement (S. Africa)	8120-6317		Yes
Power cord, replacement (Argentina)	8120-8367		Yes
Power cord, replacement (People's Rep. Of China)	8120-8373		Yes
Power cord, replacement (Chile)	8120-8452		Yes
Power cord, replacement (Hong Kong, Singapore, U.K.)	8120-8699		Yes
Module, SDRAM, 128 MB, PC133 SODIMM	1818-8504		Yes
Module, SDRAM, 256 MB, PC133 SODIMM	1818-8635		Yes
Ultraslim AC adapter (60-watt, 19-V output)	0950-3988		Yes

**Note**

In the Part Number column in the following table, parts are labeled with their model's technology code (GE or GD). Parts with no label can be used on models of either code.

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

<b>Part Number (technology code)</b>	<b>Exchange Part Number</b>	<b>Description</b>	<b>User Repl.</b>
0950-3988		Ultraslim AC adapter (60-watt, 19-V output)	Yes
1818-8504		Module, SDRAM, 128 MB, PC133 SODIMM	Yes
1818-8504		Module, SDRAM, 128 MB, PC133 SODIMM	Yes
1818-8635		Module, SDRAM, 256 MB, PC133 SODIMM	Yes
1822-0257	F2409-69103	Module, CPU (AMD Athlon, 900 MHz)	No
1822-0258 (GE)	F3928-69101	Module, CPU (AMD Athlon, 950 MHz)	No
1822-0259	F2409-69104	Module, CPU (AMD Athlon, 1 GHz)	No
1822-0497 (GD)	F2410-69102	Module, CPU (AMD Duron, 850 MHz)	No
1822-0528 (GD)	F2410-69101	Module, CPU (AMD Duron, 800 MHz)	No
1822-0580 (GE)	F3931-69101	Module, CPU (AMD Duron, 900 MHz)	No
1822-0582 (GE)	F3930-69101	Module, CPU (AMD Athlon, 1.1 GHz)	No
8120-6312		Power cord, replacement (Australia/New Zealand)	Yes
8120-6313		Power cord, replacement (U.S./Canada/Taiwan/ Mexico/Philippines)	Yes
8120-6314		Power cord, replacement (Europe/Israel/Egypt/ Saudi Arabia)	Yes
8120-6316		Power cord, replacement (Japan)	Yes
8120-6317		Power cord, replacement (S. Africa)	Yes
8120-8367		Power cord, replacement (Argentina)	Yes
8120-8373		Power cord, replacement (People's Rep. Of China)	Yes
8120-8452		Power cord, replacement (Chile)	Yes
8120-8699		Power cord, replacement (Hong Kong, Singapore, U.K.)	Yes
8121-0702		Power cord, replacement (India)	Yes
F1455-80003		Auto/airline AC adapter (75-watt)	Yes
F1469-80001		Adapter, PS/2 "Y" (F1469A)	Yes
F1660-60912 (GE)	F1660-69112	Drive, hard disk (10 GB, 9.5 mm, IBM DJSA-210)	No
F1660-60914	F1660-69114	Drive, hard disk (20 GB, 9.5 mm, IBM [Diablo] ATA100)	No
F1664-60902 (GE)	F1664-69002	Drive, hard disk (10 GB, 9.5 mm, Hitachi)	No
F2072-60908 (GE)	F2072-69108	Drive, hard disk (10 GB, 9.5 mm, Hitachi)	No
F2072-60913	F2072-69113	Drive, hard disk (20 GB, 9.5 mm, Hitachi)	No
F2111-60901 (GD)		Battery, Li-Ion (9-cell)	Yes
F2111-60911 (GD)	F2111-69011	Display, 14.1-in (cole gray)	No
F2111-60913 (GD)	F2111-69013	Display, 15-in (cole gray)	No
F2111-60914 (GD)		Kit, LCD screw covers (includes covers for all display sizes)	Yes
F2111-60915		Keyboard, U.S. English	No
F2111-60916		Keyboard, U.K. English	No
F2111-60917		Keyboard, French	No

Part Number (technology code)	Exchange Part Number	Description	User Repl.
F2111-60919		Keyboard, Spanish	No
F2111-60935		Keyboard, Japanese	No
F2111-60939 (GD)		Cover, keyboard	No
F2111-60941		PCA, switchboard	No
F2111-60946		PCA, CD player	No
F2111-60947 (GD)		Case, top (full-featured)	No
F2111-60949		Heatsink assembly (with fan)	No
F2111-60951		Set, thermal pad	No
F2111-60953 (GD)		Drive, floppy disk	No
F2111-60954 (GD)		Drive, CD	No
F2111-60955 (GD)		Drive, DVD	No
F2111-60956		Kit, hard disk drive carrier (includes bracket, strap, connector, mounting screws)	No
F2111-60960		Socket, PCMCIA (2-slot)	No
F2111-60968 (GD)		Kit, base labels (XE3—includes rating label, safety label, business card holder, barcode overlay)	No
F2111-60969 (GD)		Kit, base labels Pavilion—includes rating label, safety label, business card holder, barcode overlay)	No
F2111-60972 (GD)		Kit, screws (includes all screws needed to replace all notebook FRUs)	No
F2111-60980 (GD)	F2111-69080	Display, 13.3-in (cole gray)	No
F2297-80001		AC adapter, auto (72-watt, Europe only)	Yes
F2300-60903 (GD)		Case, top (defeatured)	No
F2300-60904 (GD)		Drive, CD-RW (4x)	No
F2300-60905 (GD)		Drive, DVD/CD-RW Combo	No
F2300-60912 (GD)	F2300-69012	Display, 14.1-in (blue)	No
F2300-60917 (GD)	F2300-69017	Display, 15-in (blue)	No
F2300-60918 (GD)		Drive, CD-RW (8x)	No
F2330-60904 (GD)	F2330-69004	Display, 14.1-in (silver)	No
F2330-60905 (GD)	F2330-69005	Display, 15-in (silver)	No
F2330-60906 (GD)	F2330-69006	Display, 13.3-in (silver)	No
F2330-60909 (GD)		Kit, covers	Yes
F2330-60910		Set, hinge saddle	No
F2330-60911		PCA, video	No
F2330-60914 (GD)		Case, bottom	No
F2330-60916		Kit, cables (includes modem cable, LAN cable, audio cable, and headphone PCA)	No
F2330-60925 (GD)		PCA, display inverter, 13.3-in TFT	No
F2330-60926 (GD)		PCA, display inverter, 14.1-in TFT	No
F2330-60927 (GD)		PCA, display inverter, 15.0-in TFT	No
F2332-60903	F2332-69003	Drive, hard disk (30 GB, 9.5 mm, Toshiba ATA66)	No
F2409-60903 (GD)	F2409-69003	PCA, motherboard AMD H2.1 (modem/LAN)	No
F2409-60904 (GD)	F2409-69004	PCA, motherboard AMD H2.1/defeatured (modem/LAN)	No
F2409-60905 (GD)	F2409-69005	PCA, motherboard AMD H2.1 (modem only)	No
F2409-60906 (GD)	F2409-69006	PCA, motherboard AMD H2.1/defeatured (modem only)	No

Part Number (technology code)	Exchange Part Number	Description	User Repl.
F2409-60907		PCA, mini-PCI (LAN/modem)	Yes
F2409-60908		PCA, mini-PCI (LAN/modem) Malaysia	Yes
F2409-60909		PCA, mini-PCI (modem)	Yes
F2409-60910		PCA, mini-PCI (modem) Malaysia	Yes
F2409-60912 (GE)		PCA, video, SXGA+	No
F3925-60901 (GE)		Battery, Li-Ion (9-cell)	Yes
F3925-60902 (GE)		Battery, Li-Ion (6-cell)	Yes
F3925-60903 (GE)		Battery, NiMH	Yes
F3925-60904 (GE)	F3925-69004	Display, 14.1-in	No
F3925-60905 (GE)	F3925-69005	Display, 15-in	No
F3925-60908 (GE)	F3925-69008	Display, 15.0-in SXGA+	No
F3925-60915 (GE)		Cover, keyboard	No
F3925-60921 (GE)		Kit, covers	Yes
F3925-60922 (GE)		Case, top (defeated)	No
F3925-60923 (GE)		Case, top (full-featured)	No
F3925-60935 (GE)		Drive, floppy disk	No
F3925-60936 (GE)		Drive, CD	No
F3925-60937 (GE)		Drive, CD-RW (8x)	No
F3925-60938 (GE)		Drive, DVD	No
F3925-60939 (GE)		Drive, DVD/CD-RW Combo	No
F3925-60950 (GE)	F3925-69050	PCA, motherboard (full featured)	No
F3925-60960 (GE)		Case, bottom	No
F3925-60965 (GE)		Kit, base labels (XE3—includes rating label, safety label, business card holder, barcode overlay)	No
F3925-60967 (GE)	F3925-69067	PCA, motherboard (defeated)	No
F3925-60975 (GE)		Kit, LCD screw covers (includes covers for all display sizes)	Yes
F3925-60976 (GE)		Kit, screws (includes all screws needed to replace all notebook FRUs)	No

## 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 HP Customer Care 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 may 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 may 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 (Thin Film Transistor) 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 may 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 notebook display.*

HP notebook 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 notebook 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 may 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 may also exist on the replacement display, and may require the customer to use a work-around to obscure the cosmetic imperfection.
4. If the cosmetic imperfection *does* meet the standards outlined in the table below, but nonetheless clearly obscures data or information in normal operating conditions with no work-around, then consider replacing the display. (For example: a group of pixels obscures a character in a document rendering the character difficult to interpret.) Work-arounds might include changing the background color of the window; changing the display brightness; repositioning the window; changing the font size or color, or changing display settings such as resolution.
5. Displays with cosmetic imperfections that do not conform to the following 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 that customer. Customers who require a more perfect display solution, without bright or dim spots (pixels) should consider switching to an HPA (High-Performance Addressing) 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. XE3 TFT LCD Guidelines (13.3/14.1/15.0-in XGA, 15.0-in SXGA+)**

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, scratches (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 A bright or dark dot is a subpixel (red, green, or blue dot) that is stuck on or off. b A polarizer dent or bubble is 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.	





- 1. Product Information**
- 2. Removal and Replacement**
- 3. Troubleshooting and Diagnostics**
- 4. Replaceable Parts**
- 5. Reference Information**

English  
Printed in Taiwan

1 2 3 4 5 6 7 8 9 10 11 12  
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Part Number (P)F2113-90026

