HP Omnibook XE3

(Intel CPU Version: Technology Code GF)
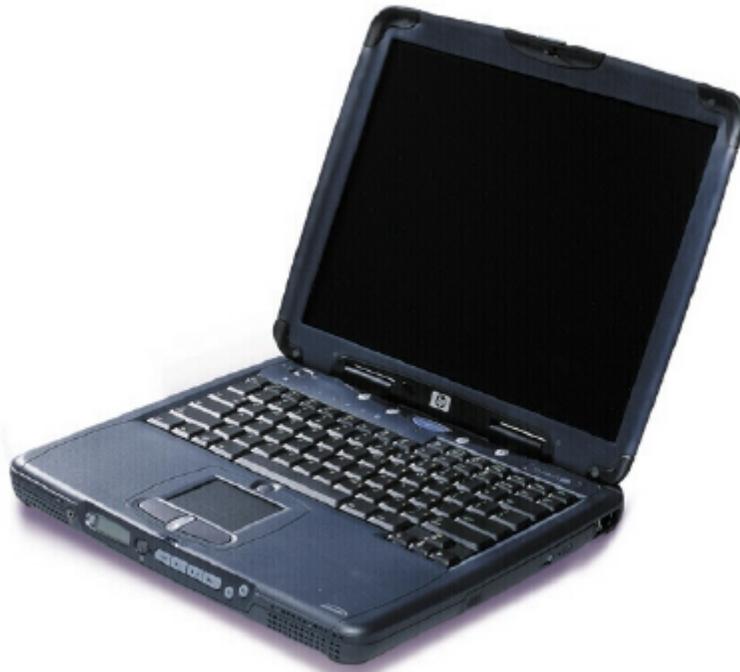
Service Manual

Notice

In a continuing effort to improve the quality of our products, technical and environmental information in this document is subject to change without notice.

Hewlett-Packard Company
Mobile Computing Division
19310 Pruneridge Ave.
Cupertino, CA 95014, U.S.A.

Edition History

Edition 1 .... August 2000

Edition 2 .... November 2001

Contents

Figures

Tables

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	http://www.hp.com/notebooks (European mirror: http://www.europe.hp.com/notebooks)	
HP Partnership Web	http://partner.americas.hp.com	Restricted to Authorized Resellers only.
HP Asia Pacific Channel Support Centre for DPSP Partners	http://www.hp.com.au	Restricted to DPSP Partners only.
HP/MCD Web Site	http://www.mcd.hp.com	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	http://www.microsoft.com	Information and updates for Windows operating systems.

1

Product Information

The Omnibook XE3 series is HP's all-in-one business notebook computer, targeted at small- to medium-sized businesses. It combines affordability, value, ease-of-use, and quality in a convenient package that integrates easily into any SMB environment. It also incorporates several new technologies and an enhanced industrial design for greater ease-of-use, quality, and reliability.

Table 1-1. Omnibook XE3 Series Models

Product	CPU [1]	Display	Hard Drive	Standard SDRAM	Full-featured [2]	CD/DVD [3]	Mini-PCI PCA [4]	Battery	OS [5]
F3941H [6]	Pentium III 1.06 GHz	15.0-in TFT XGA	20 GB	2x128 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F3942H [6]	Pentium III 1.06 GHz	15.0-in TFT SXGA+	30 GB	2x256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F4310H [6]	Celeron 933 MHz	14.1-in TFT XGA	10 GB	256 MB	No	DVD (8x)	Modem/LAN	9 Li-Ion	XP
F4109AV [6]	BTCO	BTCO	BTCO	BTCO	Yes	BTCO	Modem/LAN	BTCO	XP
F4199AV [6]	BTCO	BTCO	BTCO	BTCO	No	BTCO	Modem/LAN	BTCO	XP
F4255AV [6]	BTCO	BTCO	BTCO	BTCO	Yes	BTCO	Modem/LAN	BTCO	XP
F4256AV [6]	BTCO	15.0-in TFT SXGA+	BTCO	BTCO	Yes	BTCO	Modem/LAN	BTCO	XP
F4257AV [6]	BTCO	15.0-in TFT SXGA+	BTCO	BTCO	Yes	BTCO	Modem/LAN	BTCO	XP
F3889H [6][7]	Celeron 933 MHz	14.1-in TFT XGA	10 GB	2x128 MB	No	CD	Modem	NiMH	XP
F3963H [6][7]	Celeron 866 MHz	14.1-in TFT XGA	10 GB	128 MB	No	CD	Modem	NiMH	XP
F3962H [6][7]	Celeron 866 MHz	14.1-in TFT XGA	20 GB	2x128 MB	No	DVD (8x)	Modem	NiMH	XP
F3957H [6][7]	Celeron 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F3958H [6][7]	Celeron 933 MHz	14.1-in TFT XGA	20 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F3959H [6][7]	Pentium III 933 MHz	14.1-in TFT XGA	20 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F3964H [6][7]	Celeron 933 MHz	15.0-in TFT XGA	20 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F3960H [6][7]	Pentium III 1.06 GHz	15.0-in TFT SXGA+	30 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F4302HG [6][8]	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	XP
F4303HG [6][8]	Pentium III 1.06 GHz	15.0-in TFT XGA	30 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F4304H	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	No	CD	Modem/LAN	NiMH	XP
F4305H	Pentium III 1.06 GHz	14.1-in TFT XGA	20 GB	128 MB	Yes	CD-RW	Modem/LAN	9 Li-Ion	XP
F4306H	Pentium III 1.13 GHz	15.0-in TFT SXGA+	30 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	XP
F3943H/HG	Celeron 866 MHz	14.1-in TFT XGA	10 GB	64 MB	No	CD	Modem/LAN	NiMH	98/2K/XP
F3944H/HG	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	No	CD	Modem/LAN	NiMH	98/2K/XP
F3946H	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	CD	Modem/LAN	9 Li-Ion	98/2K/XP
F3947HT/ JT/HG/JG	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	No	DVD (8x)	Modem/LAN	NiMH	98/2K/XP
F3948H	Pentium 866 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	CD	Modem/LAN	9 Li-Ion	98/2K/XP
F3949H	Pentium 866 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3950H/HT/ JT/HG/JG	Pentium 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3951H	Pentium 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	CDRW	Modem/LAN	9 Li-Ion	98/2K/XP
F3952H	Pentium 933 MHz	15.-in TFT XGA	20 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3953H	Pentium 933 MHz	15.0-in TFT SXGA+	20 GB	256 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP

Product	CPU [1]	Display	Hard Drive	Standard SDRAM	Full-featured [2]	CD/DVD [3]	Mini-PCI PCA [4]	Battery	OS [5]
F3954H/HT/ JT/HG/JG	Pentium III 1.06 GHz	14.1-in TFT XGA	20 GB	256 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3955H/HT/ JT/HG/JG	Pentium III 1.06 GHz	14.1-in TFT XGA	30 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	98/2K/XP
F3956H/HG	Pentium III 1.06 GHz	15.-in TFT XGA	30 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	98/2K/XP
F3961HT/JT/ HG/JG	Pentium III 1.06 GHz	15.0-in TFT SXGA+	30 GB	2x256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	98/2K/XP
F3967H/HG	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3968H	Pentium 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	Combo	Modem/LAN	9 Li-Ion	98/2K/XP
F4311H	Celeron 866 MHz	14.1-in TFT XGA	10 GB	64 MB	No	CD	Modem/LAN	NiMH	98/2K/XP
F3935H	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	No	CD	Modem/LAN	NiMH	98/2K/XP
F3936H	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	CD	Modem/LAN	9 Li-Ion	98/2K/XP
F3937H	Celeron 933 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3938H	Pentium 866 MHz	14.1-in TFT XGA	10 GB	128 MB	Yes	CD	Modem/LAN	9 Li-Ion	98/2K/XP
F3939H	Pentium 866 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3969H	Pentium 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3970H	Pentium 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	CDRW	Modem/LAN	9 Li-Ion	98/2K/XP
F3971H	Pentium 933 MHz	14.1-in TFT XGA	20 GB	128 MB	Yes	Combo	Modem/LAN	9 Li-Ion	98/2K/XP
F3972H	Pentium 933 MHz	15.-in TFT XGA	20 GB	128 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3973H	Pentium 933 MHz	15.0-in TFT SXGA+	20 GB	256 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3974H	Pentium III 1.06 GHz	14.1-in TFT XGA	20 GB	256 MB	Yes	DVD (8x)	Modem/LAN	9 Li-Ion	98/2K/XP
F3975H	Pentium III 1.06 GHz	15.0-in TFT XGA	30 GB	256 MB	Yes	Combo	Modem/LAN	9 Li-Ion	98/2K/XP
F3881H	Pentium III 866 MHz	15.0-in TFT XGA	20 GB	256 MB	Yes	DVD (8x)	Modem/LAN	6 Lion	XP
F3965H/J	Celeron 866 MHz	14.1-in TFT XGA	20 GB	128 MB	No	CD	LAN	NiMH	XP
F3966H/J	Pentium 866 MHz	14.1-in TFT XGA	20 GB	128 MB	No	CD	LAN	NiMH	XP

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

BTCO = Built To Customer Order.

Units with 64 MB SDRAM will NOT support Windows XP.

[1]   Intel Mobile Pentium III or Intel Mobile Celeron processor.

[2]   Full-featured models include multimedia buttons, LCD status display, IR port, and docking-connector. Defeatured models include none of these.

[3]   Combo optical drive = DVD + CD-RW.

[4]   All modems 56K. All LAN support Ethernet 10Base-T (10 Mbps) and 100Base-T (100 Mbps).

[5]   OS = Windows 98 (98), Windows 2000 (2K), or Windows XP.

[6]   These SKUs do not have a serial port.

[7]   France and U.K. only.

[8]   Mexico only.

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, **GF**.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
GF	Omnibook XE3	Initial platform technology.
	Pavilion N5XXXX series (X is any number 0-9)	Intel processors, Windows XP operating system, cosmetic change (new lighter blue color on all plastics), second SDRAM memory access door, new IEEE 1394 port on selected models, no serial port.

Features

The following illustrations show the notebook's main external features. For an exploded view of the notebook, see page 4-2.
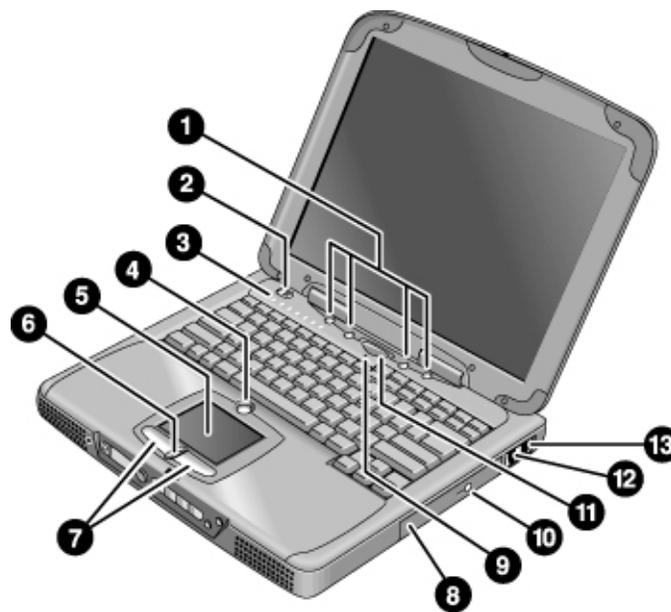
Figure 1-1. Top/Right View

1. One-Touch buttons.
2. Power switch.
3. Status lights (left to right: power status, battery status, caps lock, num lock, scroll lock, floppy drive access, hard drive access, CD/DVD drive access). See page 1-8.
4. Pad Lock touch pad on/off button.
5. Touch pad (pointing device).
6. Scroll up/down toggle.

7. Click buttons.
8. CD, CD-RW, DVD, or CD-RW/DVD drive.
9. Built-in microphone.
10. CD/DVD eject button.
11. Standby button (blue).
12. Modem port (selected models).
13. LAN port (selected models).
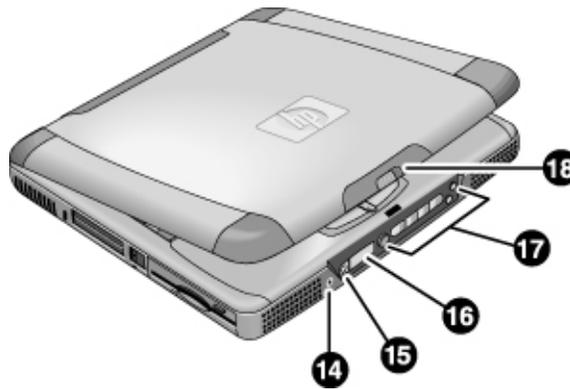
Figure 1-2. Front View

14. Headphone jack.

15. Status panel mode select button (selected models).

16. Status panel (selected models).

17. Multimedia buttons (selected models).

18. Latch (to open computer).
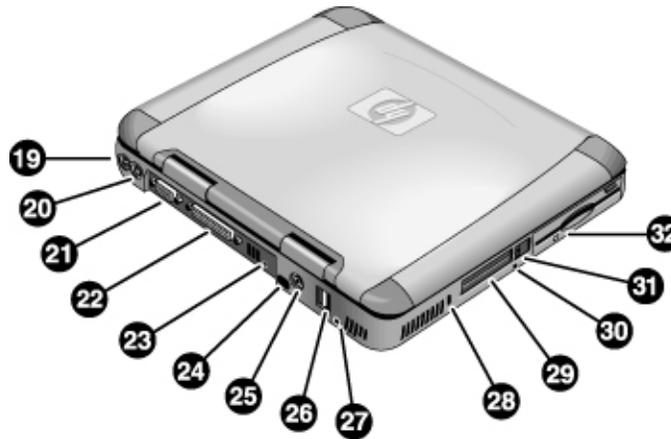
Figure 1-3. Rear/Left View

19. AC adapter jack.

20. PS/2 port (external mouse or keyboard).

21. VGA port (external monitor).

22. Parallel port.

23. IEEE 1394 port (selected models).

24. Infrared port (selected models).

25. TV output port.

26. USB ports.

27. Microphone jack.

28. Kensington lock slot (security connector).

29. PC card slots (upper and lower).

30. System-off switch (for resetting notebook).

31. PC card eject buttons.

32. Floppy disk drive.
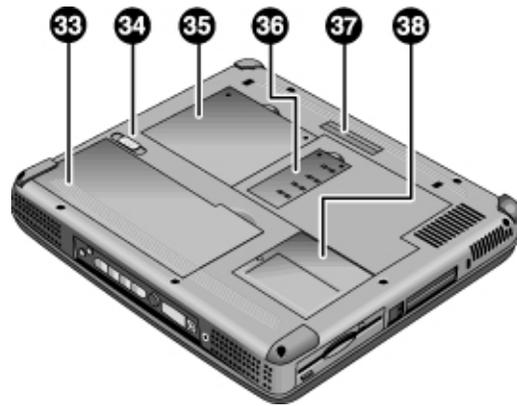
Figure 1-4. Bottom View

33. Battery.

34. Battery latch.

35. Primary RAM cover.

36. Secondary RAM cover.

37. Port replicator connector (selected models).

38. Mini-PCI cover.

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
Display-off mode 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").
Standby mode 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, Shut Down, Standby (Windows 98 or 2000). –or– Click Start, Turn Off Computer, Stand By (Windows XP).	Press the blue standby button to return to your current session ("Instant-On").
Hibernate mode Power status LED turns off. Saves maximum power. Saves the current session to disk, then turns off. Restores network connections.	Click Start, Shut Down, Hibernate (Windows 2000). –or– Click Start, Turn Off Computer, then press and hold Shift and click Hibernate (Windows XP).	Press the blue standby button to recover your previous session.
Turn off 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, Shut Down, Shut down (Windows 98 or 2000). –or– Click Start, Turn Off Computer, Turn Off (Windows XP). –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.
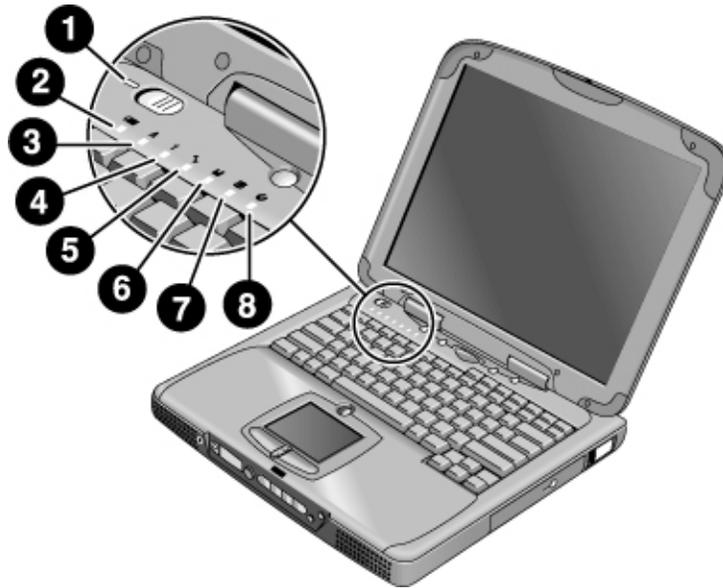
Figure 1-5. Status Lights

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	**Power status** Green: the notebook is on. Amber: the notebook is in standby mode. No light: the notebook is off or in hibernate mode.
(battery icon)	**Battery status** 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.
A	**Caps Lock** Caps Lock is active.
1	**Num Lock** Num Lock is active. (The Keypad Lock must also be on to use the embedded keypad.)
(scroll lock icon)	**Scroll Lock** Scroll Lock is active.
(floppy disk icon)	**Floppy disk drive activity** Green: the notebook is accessing the floppy disk drive.
(hard disk icon)	**Hard disk drive activity** Green: the notebook is accessing the hard disk drive.
(CD/DVD icon)	**CD/DVD drive activity** 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.
Fn+F2	Increases the display brightness.
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, shut down Windows: click Start, Shut Down, Shut down (Windows 98 or 2000) or Start, Turn Off Computer, Turn Off (Windows XP).

- Press Ctrl+Alt+Del, then click Shut Down.

- Slide and hold the power switch for about five seconds, until the display shuts down.

- Insert a straightened paper clip into the system-off switch on the left side of the notebook (beneath the PC card eject buttons).
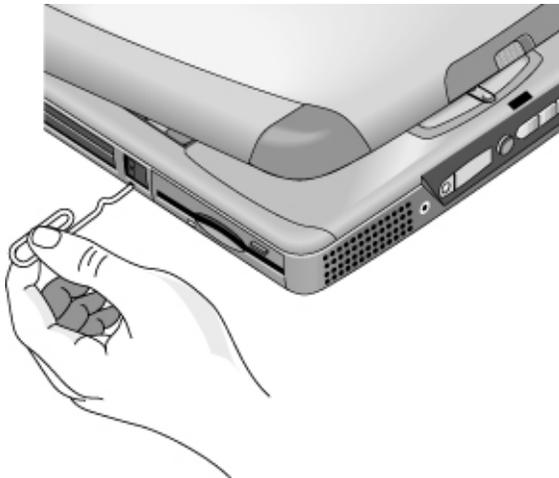
Figure 1-6. Resetting the Notebook

After the notebook turns off, press the blue standby button to restart it.

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*.
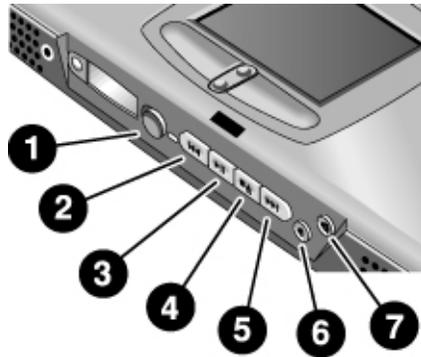
Figure 1-7. Multimedia Buttons

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 (in Europe: www.europe.hp.com/notebooks).

Hardware Specifications

Table 1-5. XE3 Series Hardware Specifications

|	
Physical Attributes	**Size:** 13.03 x 10.72 x 1.59 in (331 x 272.4 x 40.5 mm) for 13.3/14.1-in TFT LCD. 13.46 x 10.92 x 1.65 in (342 x 276.6 x 42.0 mm), excluding rubber thickness, for 15-in TFT LCD. **Weight:** 7 lbs (3.2 kg) minimum.
Processor	933-MHz to 1.13-GHz Intel Mobile Pentium III processor with SpeedStep technology. –or– 866- to 933-MHz Intel Celeron-T processor.
Chip Set	Ali M1647 + M1535.
SDRAM	133 MHz SDRAM (PC133). No SDRAM on board. Two 1.25-in. slots for expansion up to 1024 MB, using two 512-MB SODIMM modules (144 pin, 3.3 V). Supports 64/128/256/512-MB SODIMMs.
Mass Storage	**Hard disk drive:** – 10, 20, or 30 GB, PCI Bus Master Enhanced IDE. – 9.5 mm, 2.5 in. – Supports Ultra DMA/33/66/100. **Floppy disk drive:** 1.44 MB, 12.7 mm, 3-mode module. **Optical drive:** 24x CD, 8x DVD, 24x-8x CDRW, 4x-24x-4x DVD-CD-RW (Combo), 12.7 mm module.
Display	13.3/14.1/15.0-in XGA (1024x768) or 15.0-in SXGA+ (1400x1050) TFT LCD.
Graphics Controller	Intel 830M graphics controller. 8 to 32 MB of video memory (shared with main system memory and dynamically allocated, based on application needs).
Power	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 hr (system off), 3 hr (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.
Keyboard and Pointing Devices	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. NS 87570 keyboard controller.
Audio System	CD player with built-in control buttons and status display (selected models). Two stereo speakers. Built-in microphone. Microphone and headphone jacks.

Audio	ESS Allegro (1988) – Integrated AC'97 CODEC – HSP modem interface via MC'97 link – Support wake up on Ring. Modem CODEC ESS 2828 on mini-PCI slot
Communications	**LAN:** Onboard LAN (Intel Pro/100). – Transmission rate: 10 or 100 Mbps based on Auto-Negotiation. – Data standard: supports Category 3 (10Base-T/100Base-T) and Category 5 (100Base-TX) media coupler. – Power management: supports remote power-up using Wake on LAN from S3 (suspend) (WOL) technology and Deep power-down mode support. **Modem:** – 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. – Error correction: V.42 LAPM, and MNP 2-4 error correction. – Data compression: V.42bis and MNP 5 data compression. – Fax modem standard: send/receive rates up to 14400 bps, V.17, V.29, V.27ter, and V.21 channel 2. – Power management: supports ACPI Power Management and wake up on Ring from S3.
Input/Output	High-speed bidirectional parallel port: 25 pins, EPP/ECP capability. VGA port: 15 pins. IEEE 1394 port (on selected models). Infrared port (on selected models). 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).
Expandability	Two Type II or one Type III 16-/32-bit PCMCIA slots.
Options	64/128/256/512-MB PC133 SODIMM: 3.3V, 144-pin, SDRAM. Simple port replicator. Mini-PCI modem, supporting wake-up on Ring# from D3 (cold) with AC-in. Mini-PCI modem/LAN combo, supporting wake-up on Ring# & PME# from D3 (cold) with AC-in.
Environmental Limits	Operating temperature: 0 to 35 °C (32 to 95 °F). Storage temperature: –20 to 65 °C (–4 to 149 °F). Operating humidity: 10% 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).

Table 1-6. XE3 Series Accessories

Accessory	Description
Memory	
F1457C	64-MB SDRAM PC133 SODIMM expansion module
F3495A	128-MB SDRAM PC133 SODIMM expansion module
F3496A	256-MB SDRAM PC133 SODIMM expansion module
Power Options	
F1455A	Auto/airline AC adapter (75-watt)
F1781A	Ultra Slimline AC adapter (60-watt)
F2024A/B	LiIon 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)
Adapters	
F1469A	PS/2 "Y" adapter
PC Cards	
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
Docks	
F2025B	Simple port replicator
Security Accessories	
F1645A	Kensington MicroSaver Notebook Security System
F1747A	Port Defcon 1 Notebook Security System
Other	
P1534A	HP amplified external speakers
P1977A	USB Compact Flash & IBM Microdrive reader
P1978A	USB web camera
F2100A	USB optical mouse

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.
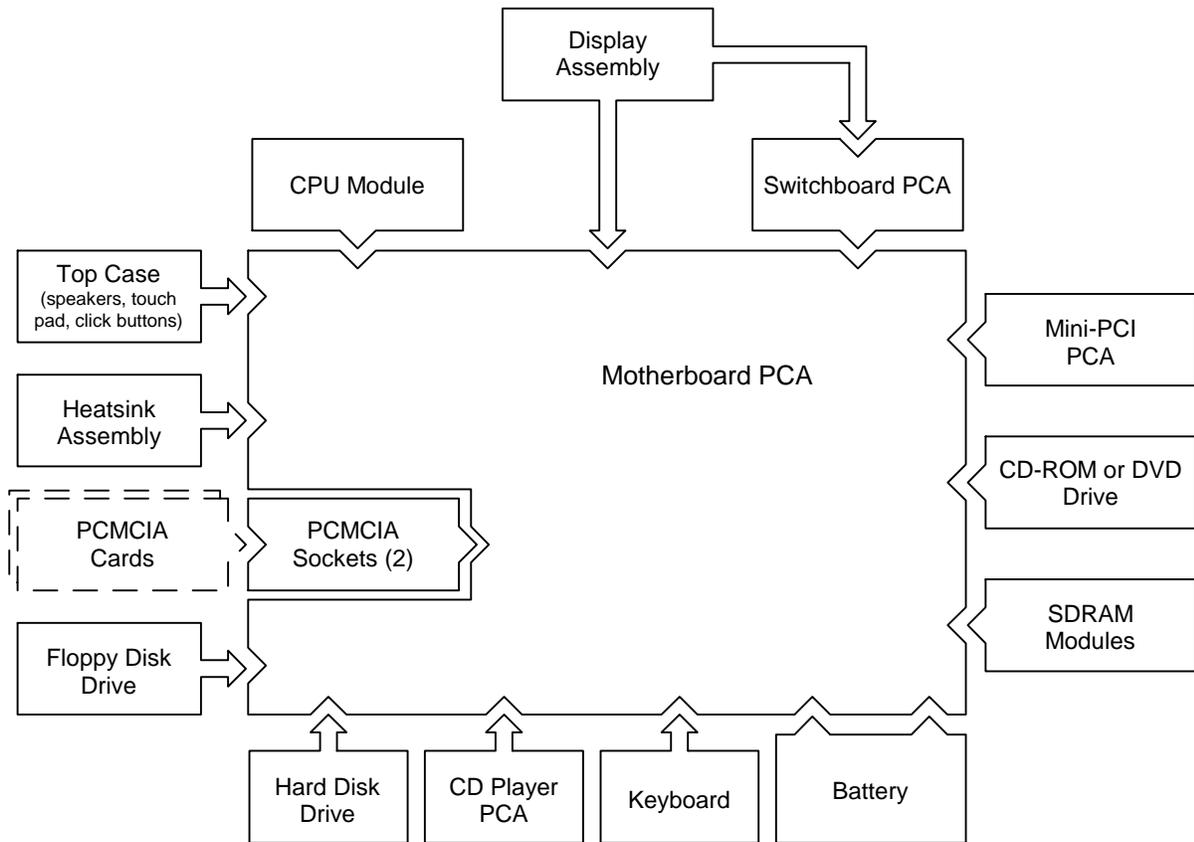

Figure 1-8. Replaceable Module Diagram

Table 1-7. Functional Structure

Function	Components Used	Component Roles
Bootup	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.
Processor	CPU module Motherboard	Main processor, numeric data processor, L1 and L2 cache. Primary system circuitry.
Memory	Motherboard SDRAM module	Video RAM. Changeable RAM (2 slots).
Power	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.
Display	Motherboard Display assembly	Video controller, display drivers, LVDS processing, display/graphics controller, video RAM. Display output, backlight, power converter for backlight.
Hard disk	Motherboard Hard disk drive	Hard disk controller. Hard disk mechanism.
Floppy drive	Motherboard Floppy disk module	I/O controller, floppy connector. Floppy disk mechanism.
Keyboard	Motherboard Keyboard	Keyboard controller, keyboard BIOS. Key switches.
Touch pad	Motherboard Top case	Keyboard BIOS. Touch pad sensor, click buttons, controller (PS/2 output).
Audio	Motherboard Switchboard PCA Headphone PCA Top case	Audio controller, audio decoder, speaker amplifier, external microphone jack. Microphone. Earphone amplifier. Speakers.
Status	Motherboard Switchboard PCA CD player PCA	LED circuitry, keyboard controller. Status LEDs. CD/DVD status display.
Parallel	Motherboard	I/O controller, parallel connector.
PS/2 port	Motherboard	Keyboard controller, PS/2 connector.
USB	Motherboard	Bus controller, USB connectors.
Docking port	Motherboard	Docking logic, docking connector.
PCMCIA	Motherboard PCMCIA sockets	PCMCIA controller. PCMCIA connectors.

2

Removal and Replacement

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

Table 2-1. Removal Cross-Reference

- • Battery (page 2-4).
  Carrier, hard disk drive (page 2-13).
  Case, bottom (page 2-32).
  Case, top (page 2-19).
  Cover, keyboard (page 2-8).
- • Cover, mini-PCI (page 2-7).
- • Cover, SDRAM (page 2-7).
- • Covers, screw (page 2-7).
  Display assembly (page 2-16).
  Doors, docking (page 2-36).
  Doors, PCMCIA (page 2-37).
  Drive, CD/DVD (page 2-31).
  Drive, floppy disk (page 2-29).

Drive, hard disk (page 2-12).
Heatsink assembly (with fan) (page 2-24).
Keyboard (page 2-10).
Module, CPU (page 2-26).
- • Module, SDRAM (page 2-5).
  PCA, CD player (page 2-21).
  PCA, headphone (page 2-39).
- • PCA, mini-PCI (page 2-6).
  PCA, motherboard (page 2-32).
  PCA, switchboard (page 2-39).
  Plate, CPU support (page 2-40).
  Saddle, hinge set (page 2-22).
  Socket, PCMCIA (page 2-40).

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 M2.5×5 mm T-head screw.)

Disassembly Flowchart

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

```
                        ┌─────────────┐
                        │    Start    │
                        └─────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │   Battery, AC adapter,   │
                  │ SDRAM modules, mini-PCI card │
                  └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │     Keyboard cover       │
                  └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐        Switchboard PCA
                  │        Keyboard          │ ─────▶ (also remove if removing
                  └──────────────────────────┘        motherboard or bottom
                               │                       case assembly)
    Only if not removing       │
        motherboard            ▼
        or bottom case   ┌──────────────────────────┐
                  ───────│   Hard disk drive assembly │
                         └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │     Display assembly     │
                  └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │     Top case assembly    │ ─────▶ CD player PCA
                  └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │     Hinge saddle set     │
                  └──────────────────────────┘
                               │
    If removing only           ▼
    heatsink assembly   ┌──────────────────────────┐
    or CPU module       │ • CD-ROM/DVD drive assembly │
                  ──────│ • Floppy disk drive assembly │
                        │ • Headphone PCA          │
                        └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │ Heatsink assembly (with fan) │
                  └──────────────────────────┘
                               │
                               ▼
                  ┌──────────────────────────┐
                  │       CPU module         │
                  └──────────────────────────┘
                               │
                               ▼                        • CPU support plate
                  ┌──────────────────────────┐ ─────▶  • Docking doors
                  │    Motherboard or        │          • PCMCIA doors
                  │    bottom case           │
                  └──────────────────────────┘
```

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

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

NOTES

Removing the Battery
(User-Replaceable)

Required Equipment

- None.

Removal Procedure

- Slide the battery's release latch, then lift the battery out of its compartment.
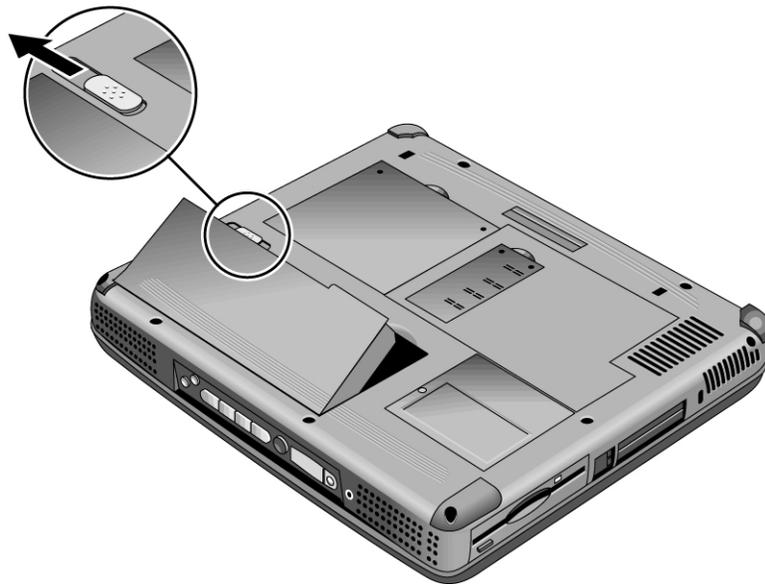
Figure 2-2. Removing the Battery

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 two slots for 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 the screws holding the appropriate SDRAM cover (the cover retains the screws), and remove the cover.
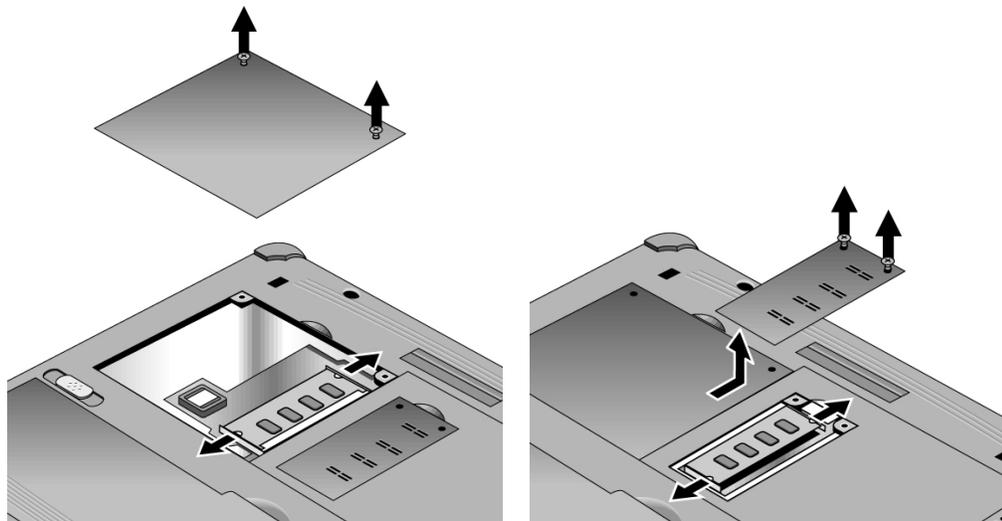
Figure 2-3. Removing the SDRAM Covers

3. Press outward to release the latches at the sides of the SDRAM module, so the free edge of the module pops up.
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 (modem)	F3377-60950	

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, so that its free edge pops up.
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.
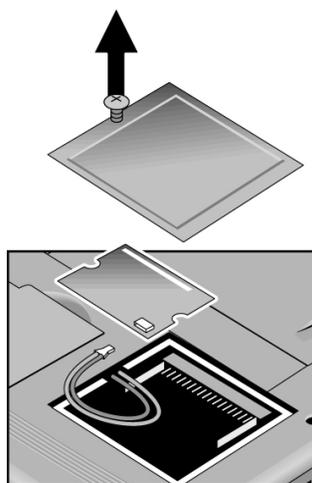
Figure 2-4. Removing the Mini-PCI PCA

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 the sticky pads are intact and in place on the underside of the PCA.

Replacing Small Parts
(User-Replaceable)

The user can replace the following small parts.

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

Part	Replacement Procedure
Cover, mini-PCI	On the bottom of the notebook, loosen the screw in the mini-PCI cover (the cover retains the screw) and remove the cover.
Covers, SDRAM	On the bottom of the notebook, loosen the screws in the SDRAM module covers (the covers retains the screws) and remove the covers.
Covers, screw (on display bezel)	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.

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.
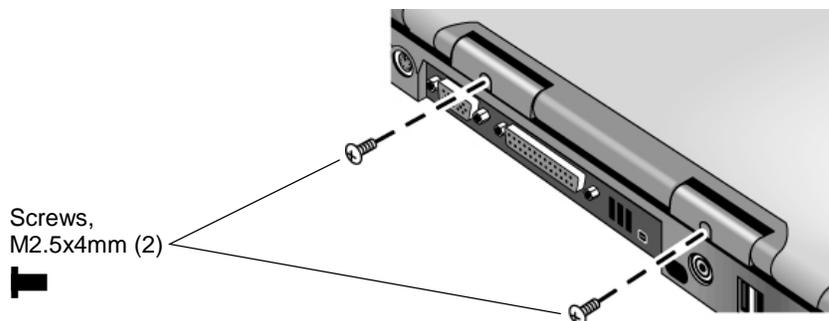
Screws,
M2.5x4mm (2)

Figure 2-5. 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.
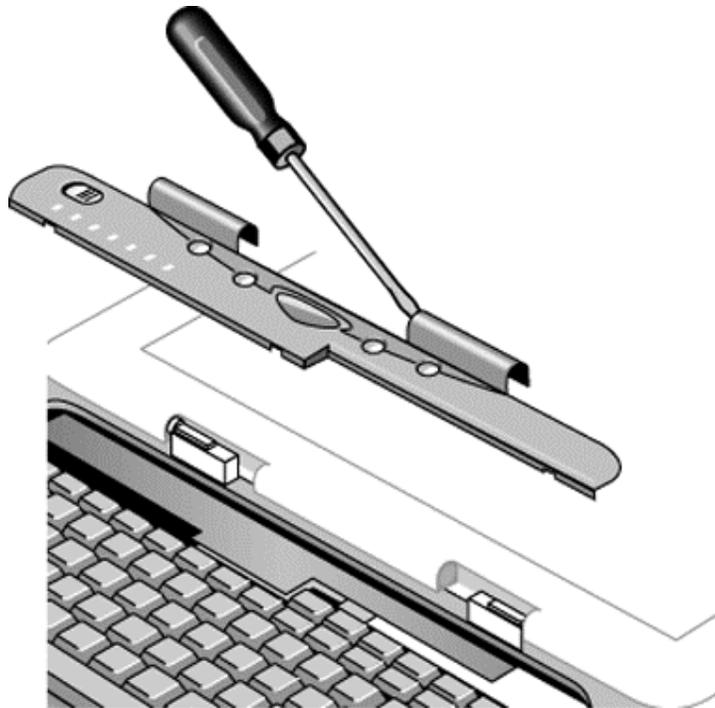
Figure 2-6. Removing the Keyboard Cover

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. Note that the cover is held in place partly by tabs at the left and center of its 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 2-8).

3. Loosen the four retaining screws along the top of the keyboard (the keyboard retains the screws).
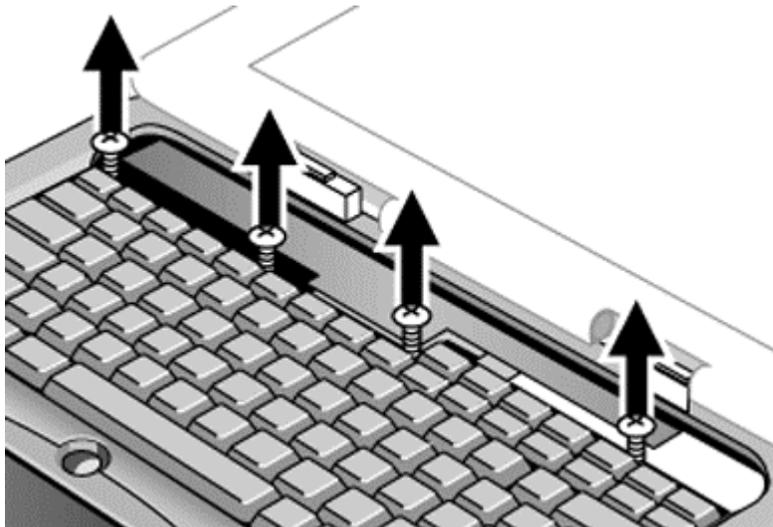
Figure 2-7. Loosening the Keyboard Retaining Screws

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.

Keyboard
ribbon cable
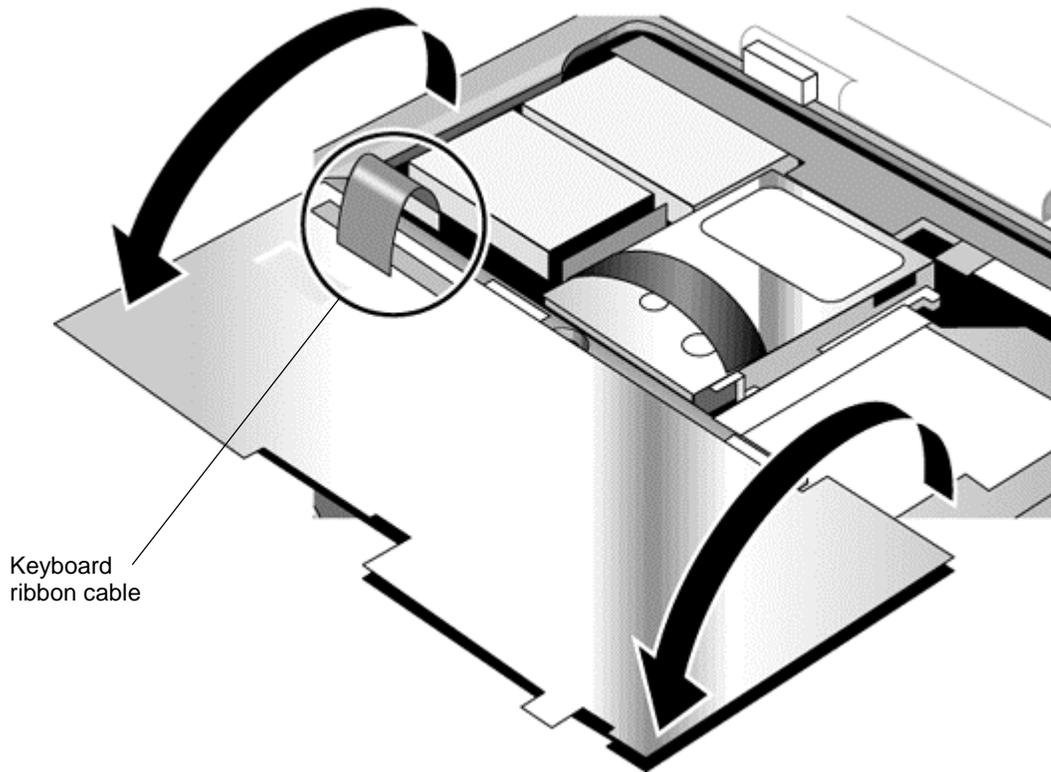
Figure 2-8. Disconnecting the Keyboard Cable

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 2-8).

   - Keyboard (page 2-10).

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.
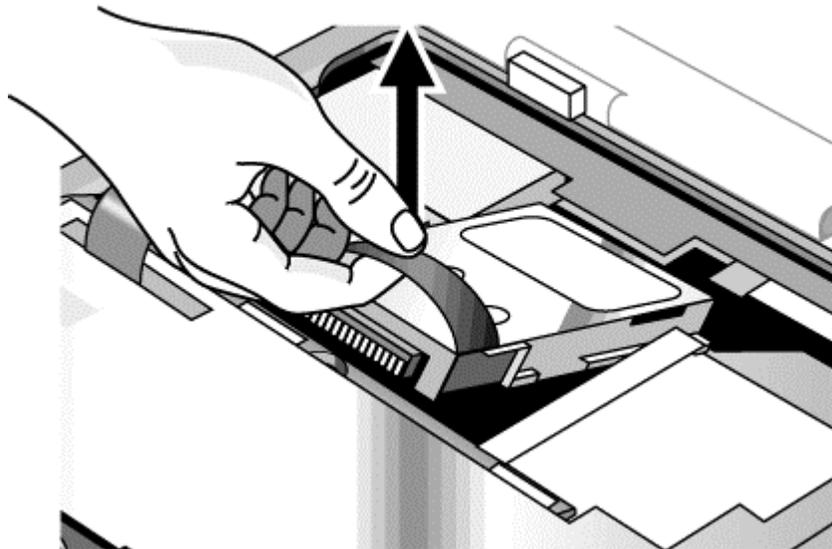
Figure 2-9. Removing the Hard Disk Drive

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.
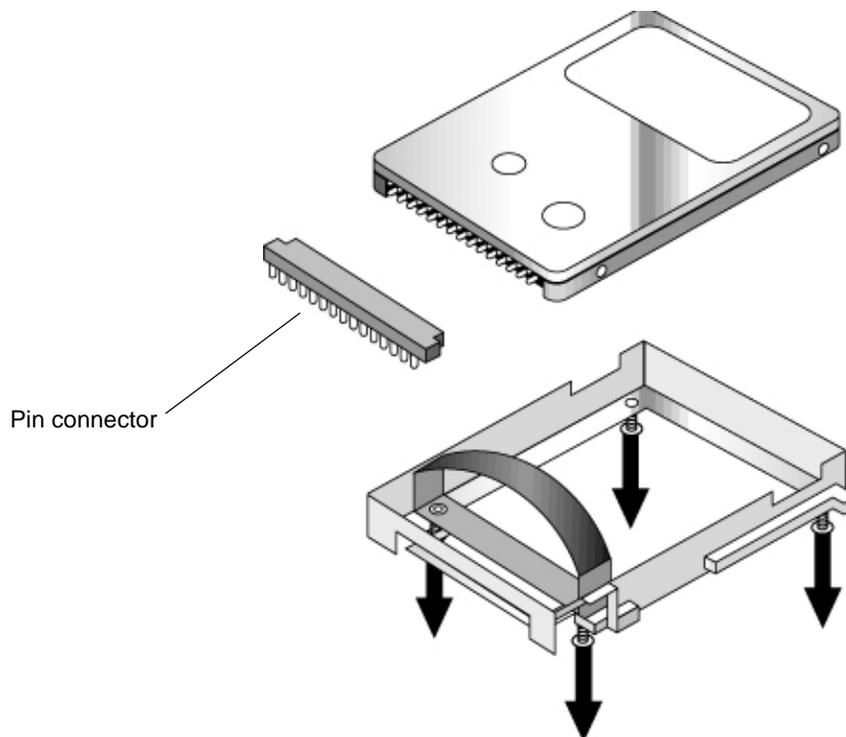
Pin connector

Figure 2-10. 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.

- Be careful not to trap the heatsink and keyboard 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.

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/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 2-8).

   - Keyboard (page 2-10).

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. Remove the four flanged screws from the display hinges. This may be easier if you support the display so that it remains approximately flat.

6. Lift the display off of the notebook.
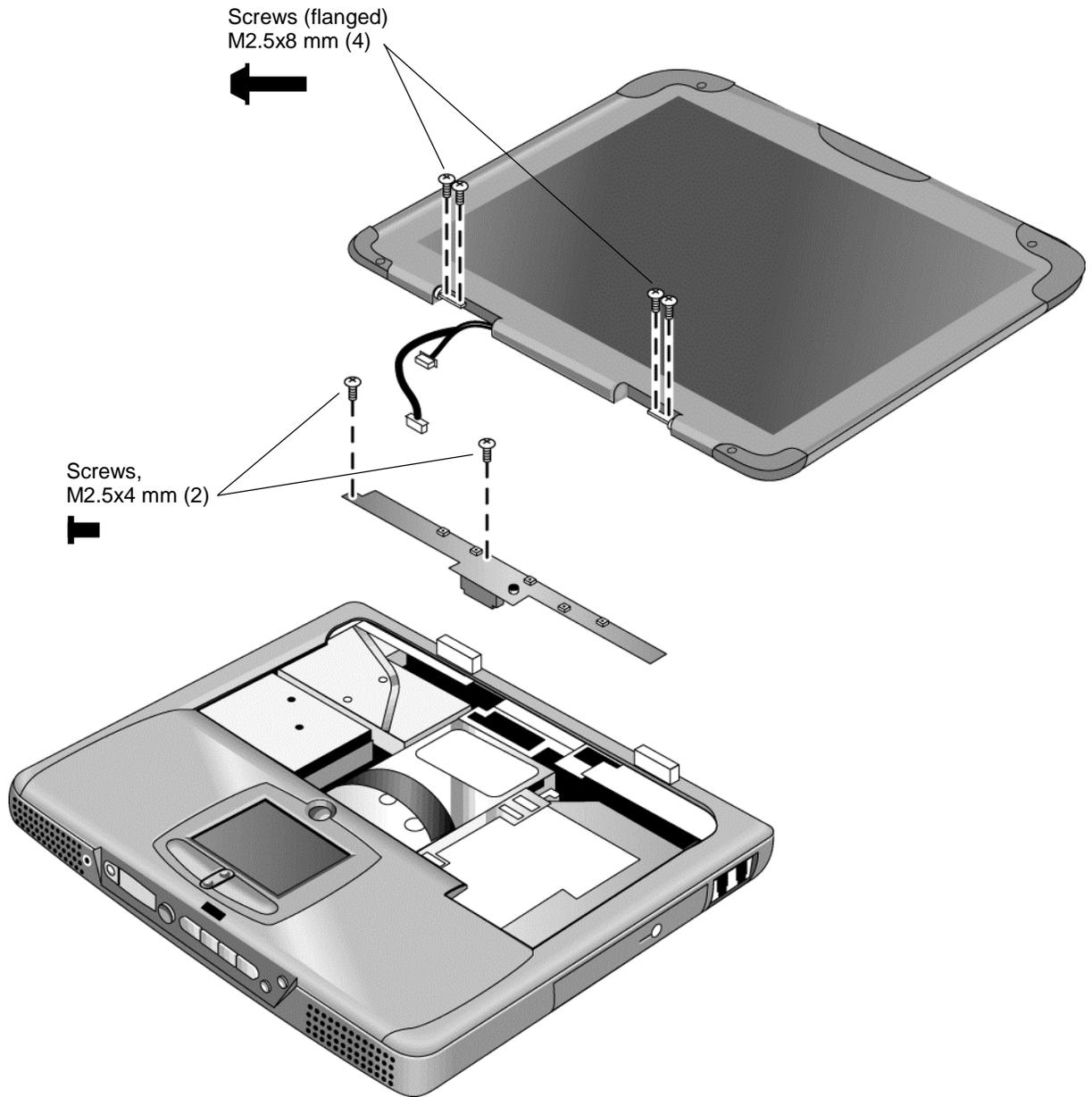
Figure 2-11. Removing the Display

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 motherboard 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 motherboard as shown.

Table 2-8. Motherboard Video DIP Switch Settings

Model	1	2	3	4
Hitachi 15-in TFT SXGA+	ON	OFF	OFF	OFF
Hitachi 15-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
LG 15-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-in TFT SXGA+	OFF	ON	ON	ON
IBM 14.1-in TFT XGA	OFF	ON	ON	OFF

As an example, the following figure shows the DIP switches set to OFF-ON-ON-ON:
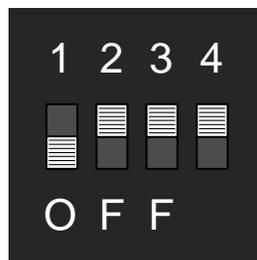
Figure 2-12. Motherboard DIP Switches

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 2-8).

    - Keyboard (page 2-10).

    - Display assembly (page 2-16).

3. Remove the eight retaining screws from the bottom case.

Screws,
M2.5x8 mm (4)
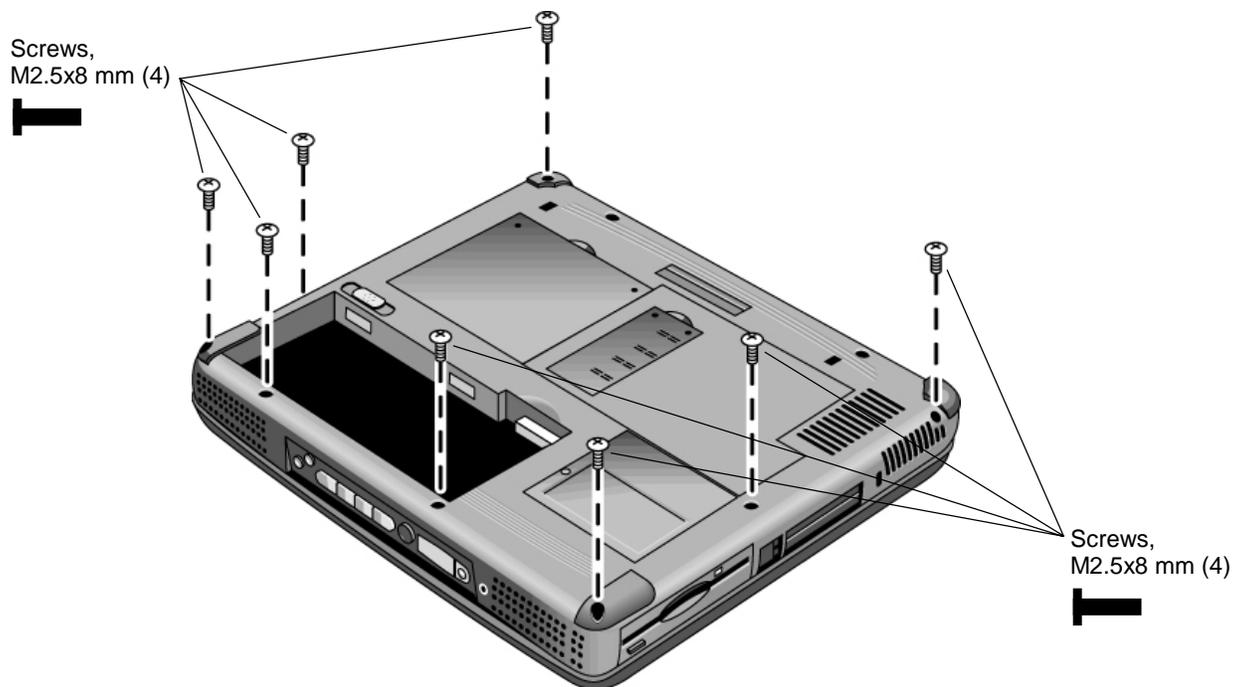
Screws,
M2.5x8 mm (4)

Figure 2-13. 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.

Touch pad cable

Speaker cables

CD player ribbon cable

Screw, M2.5x8 mm (1)

Screws, M2.5x4 mm (5)
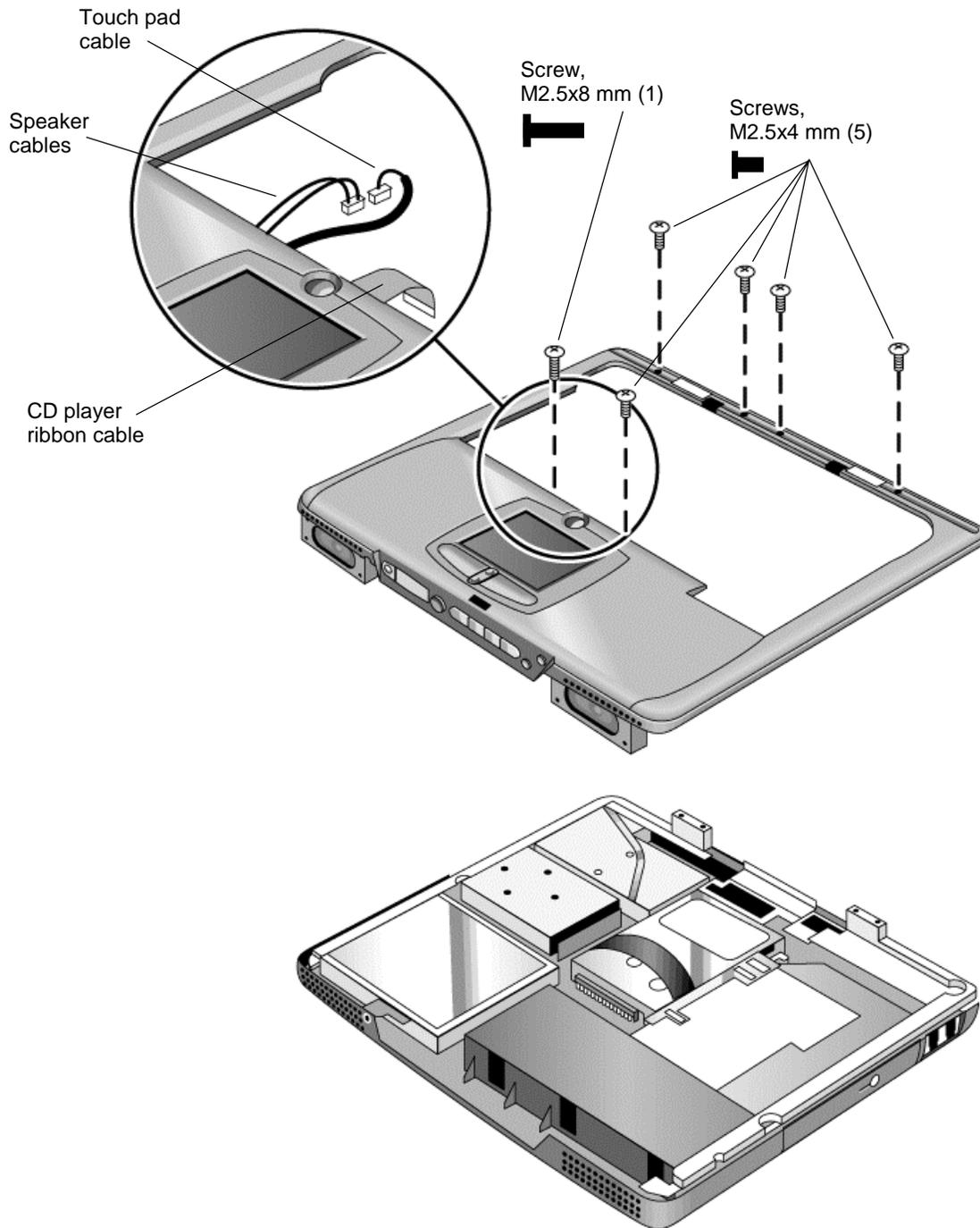
Figure 2-14. Removing the Top Case

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 2-8).

   - Keyboard (page 2-10).

   - Display assembly (page 2-16).

   - Top case (page 2-19).

3. Remove both standoff screws (use a 5-mm socket screwdriver), and lift the PCA out of the top case.

CD player PCA standoff screws, 5 mm (2)
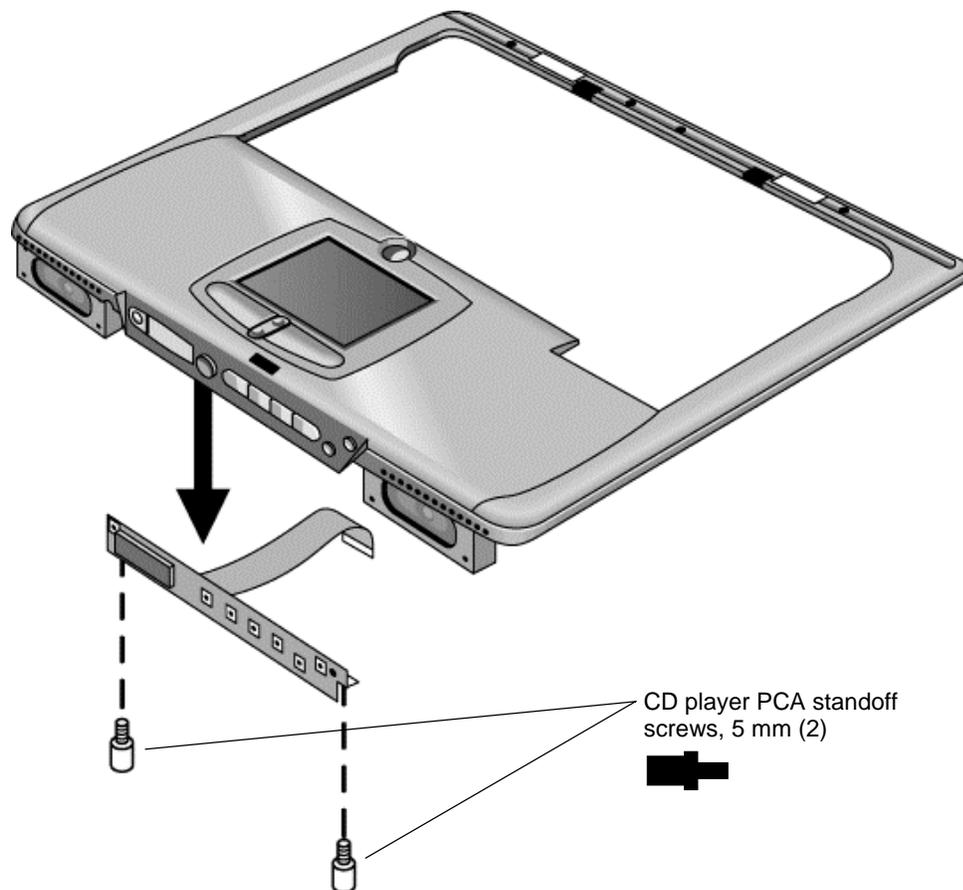
Figure 2-15. Removing the CD Player PCA

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 2-8).

   - Keyboard (page 2-10).

   - Display assembly (page 2-16).

   - Top case (page 2-19).

3. Remove the two retaining screws from the bottom case.
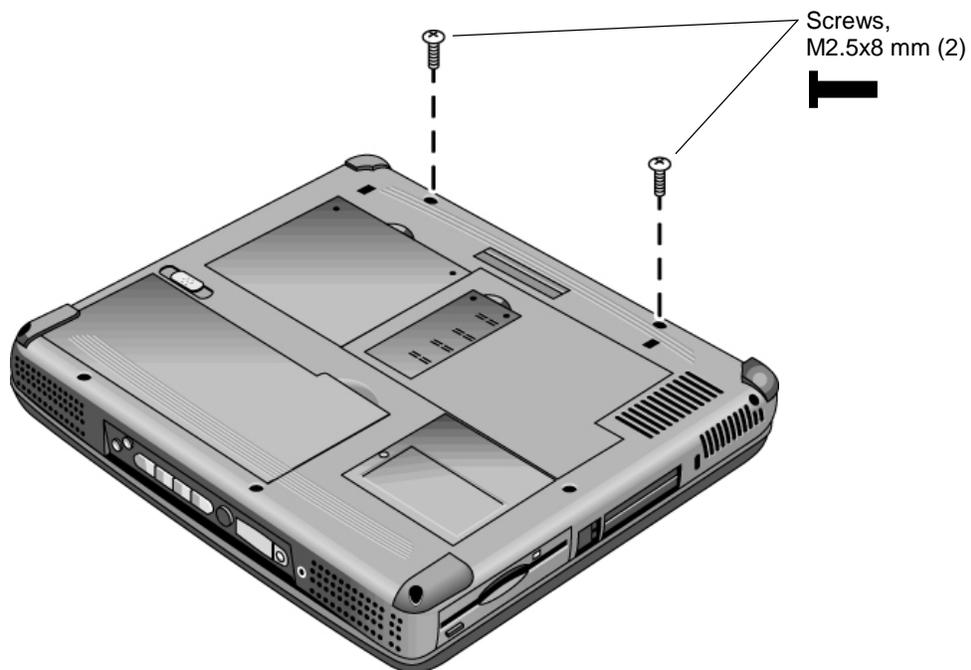
Screws,
M2.5x8 mm (2)

Figure 2-16. 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.

Screws,
M2.5x8 mm (2)

Screws,
M2.5x8 mm (2)
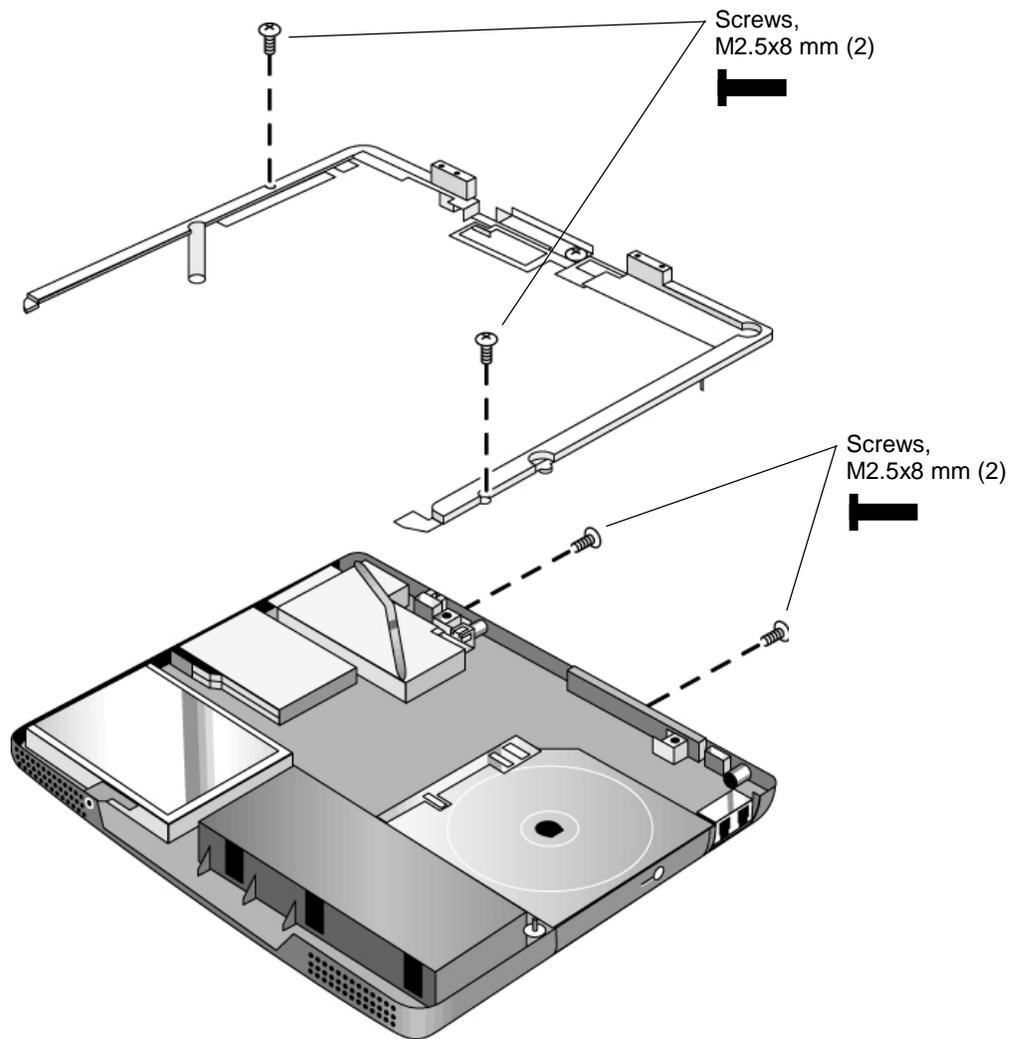
Figure 2-17. Removing the Hinge Saddle

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 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 2-8).

   - Keyboard (page 2-10).

   - Display assembly (page 2-16).

   - Top case (page 2-19).

   - Hinge saddle set (page 2-22).

3. Disconnect the fan cable from the motherboard.

4. Remove all four retaining screws (their springs are attached to them).

5. Lift the heatsink out of the notebook.

Heatsink retaining
screws (with springs)
(4)
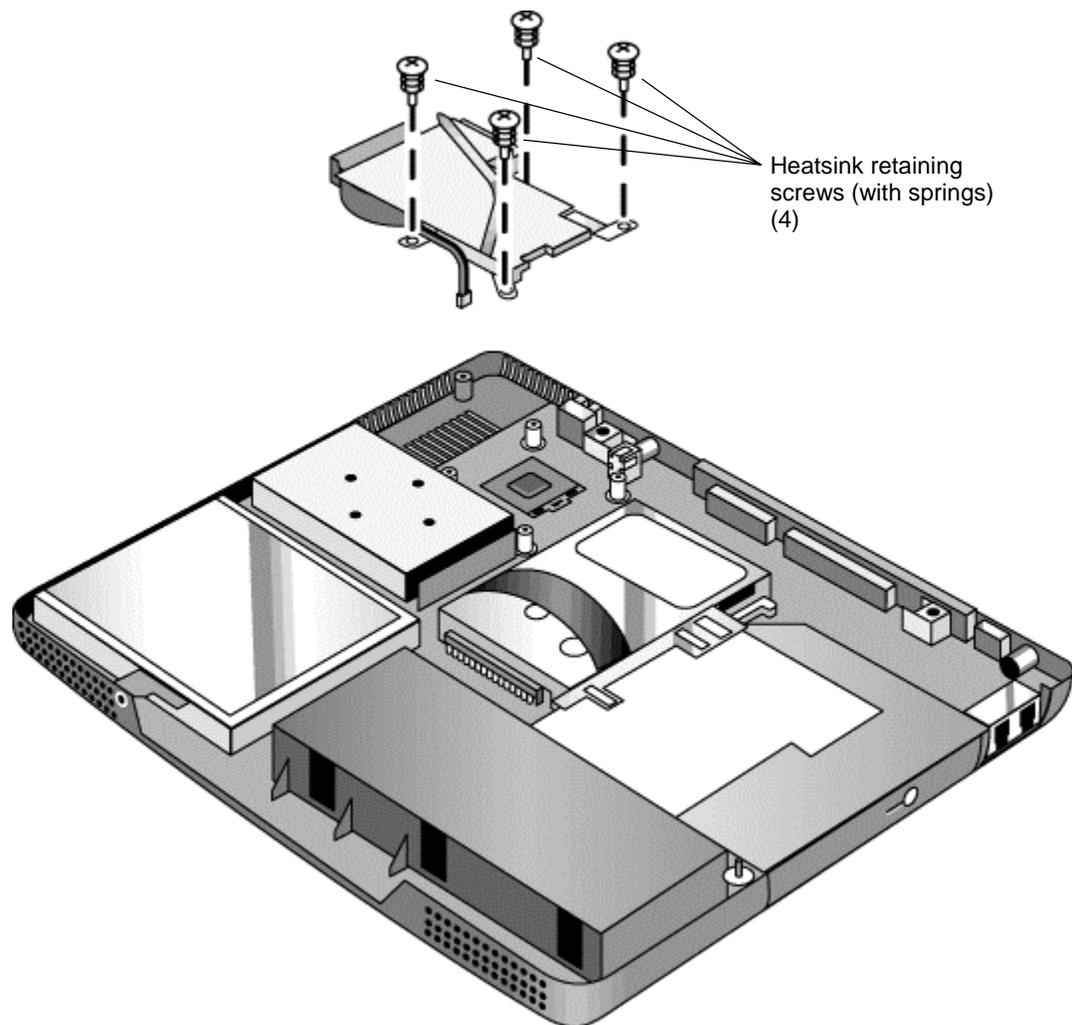
Figure 2-18. Removing the Heatsink Assembly

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 2-9. CPU Module Replacement Part Numbers

Description	Part Number	Exchange Part Number
Module, CPU (Pentium III-M, 866 MHz Tualatin)	F3950-60901	F3950-69101
Module, CPU (Pentium III, 933 MHz Tualatin)	F3257-60904	F3257-69004
Module, CPU (Pentium III-M, 1.06 GHz Tualatin)	F3941-60901	F3941-69101
Module, CPU (Pentium III, 1.13 GHz Tualatin)	F3257-60906	F3257-69006
Module, CPU (Celeron-T, 800 MHz Tualatin)	F3943-60901	F3943-69101
Module, CPU (Celeron-T, 866 MHz Tualatin)	F3944-60901	F3944-69101
Module, CPU (Celeron-T, 933 MHz Tualatin)	F3946-60901	F3946-69101

Required Equipment

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

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 2-8).
   - Keyboard (page 2-10).
   - Display assembly (page 2-16).
   - Top case (page 2-19).
   - Hinge saddle set (page 2-22).
   - Heatsink assembly (page 2-24).

3. **Pentium SKUs:** Carefully insert the tip of a flat-blade screwdriver in the CPU module lock mechanism, and turn the screwdriver a few degrees counterclockwise until the mechanism clicks into its OPEN position. (The CPU socket moves slightly to the left when this happens.)

   Grasp the CPU module by its edges, and carefully lift it straight up and off of its socket.

CPU module

CPU module
lock mechanism
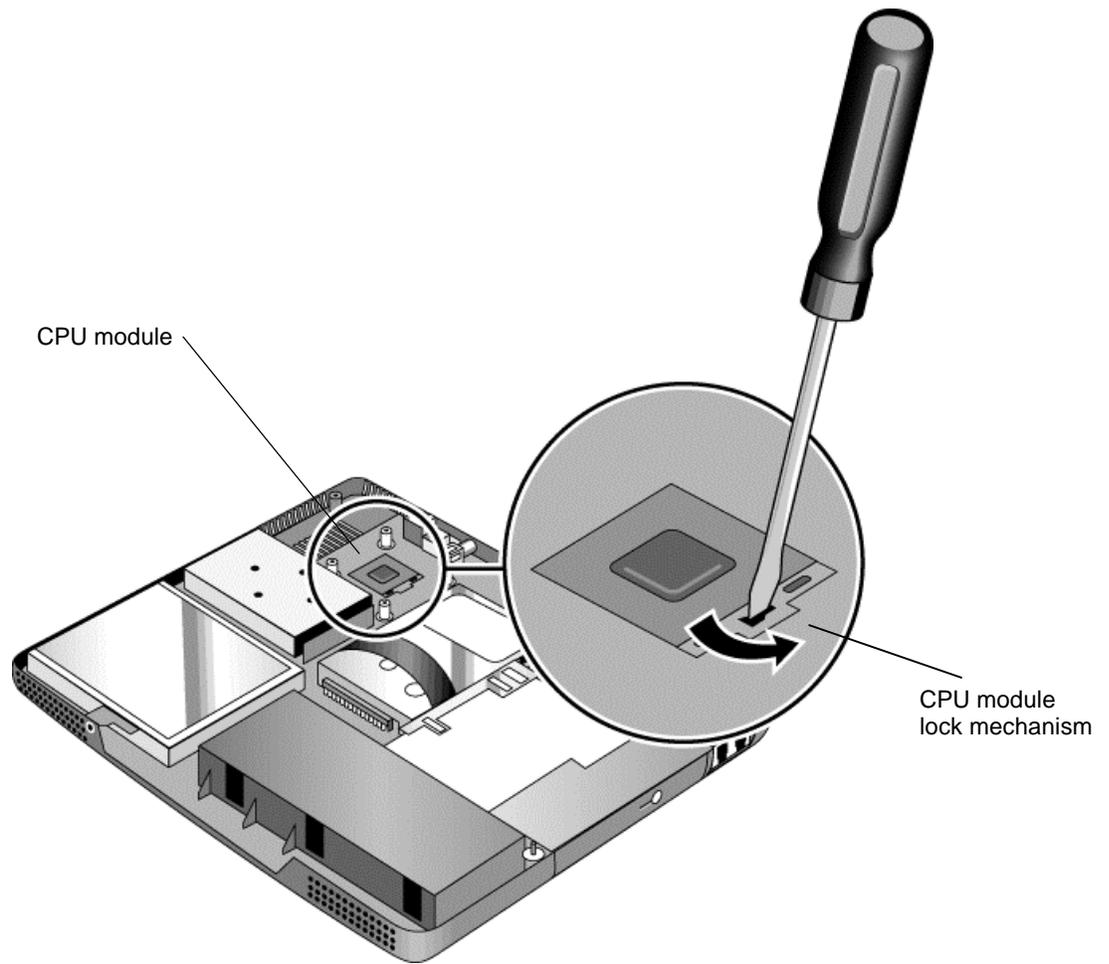
Figure 2-19. Removing the CPU Module (Pentium)

4. **Celeron SKUs:** Turn the lock screw one-half turn counterclockwise to release the CPU module, and remove the CPU module from the motherboard.

CPU module

CPU module lock mechanism
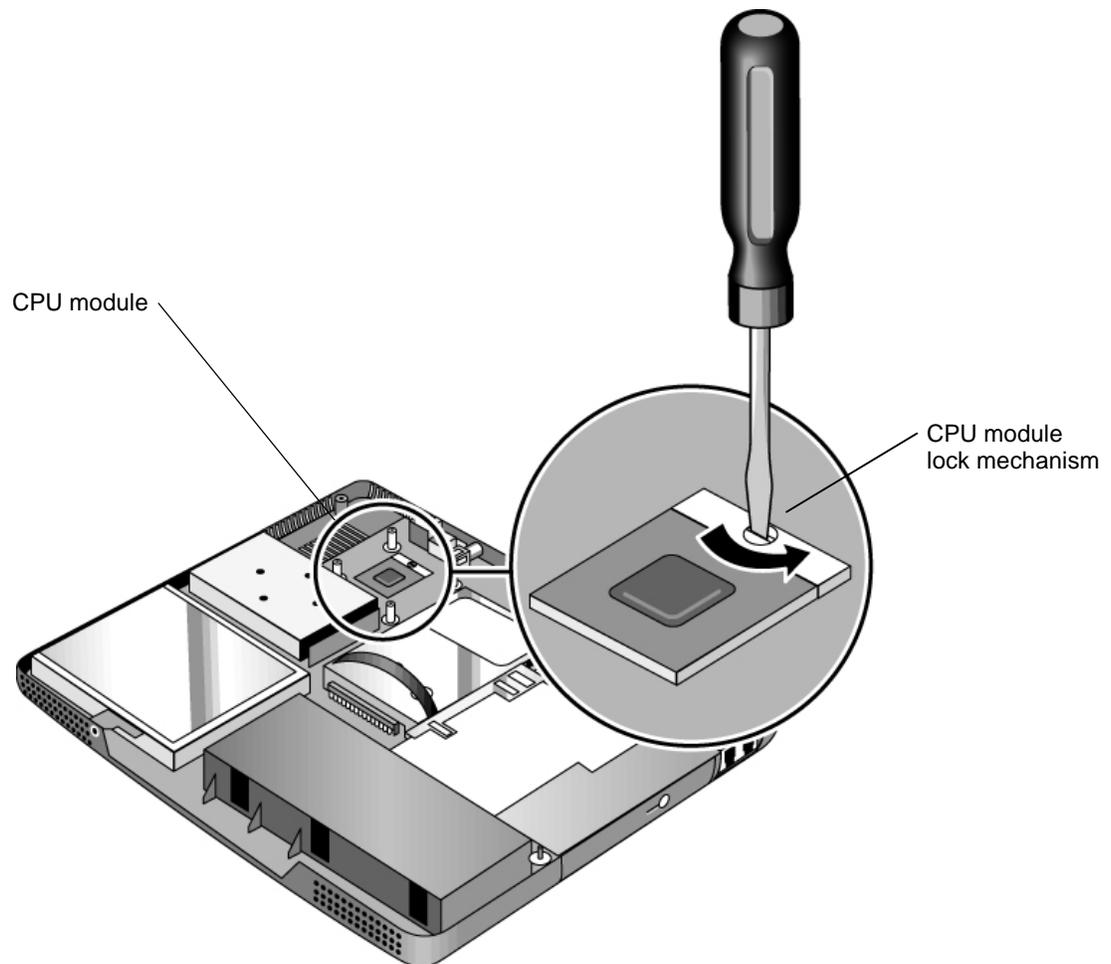
Figure 2-20. Removing the CPU Module (Celeron)

Reassembly Notes

- Carefully reinsert the module into its socket. Make sure the module is fully seated, and that none of its pins are bent or otherwise damaged.

- **Pentium SKUs:** Carefully insert the tip of the flat-blade screwdriver in the CPU module lock mechanism, and turn the screwdriver a few degrees clockwise until the mechanism clicks into its LOCK position. (The CPU socket moves slightly to the right when this happens.)

- **Celeron SKUs:** Carefully insert the CPU module into the motherboard. The module is keyed for installation, and can only be inserted one way. Turn the lock screw one-half turn clockwise to secure the CPU module.

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 2-8).

   - Keyboard (page 2-10).

   - Display assembly (page 2-16).

   - Top case (page 2-19).

   - Hinge saddle set (page 2-22).

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.
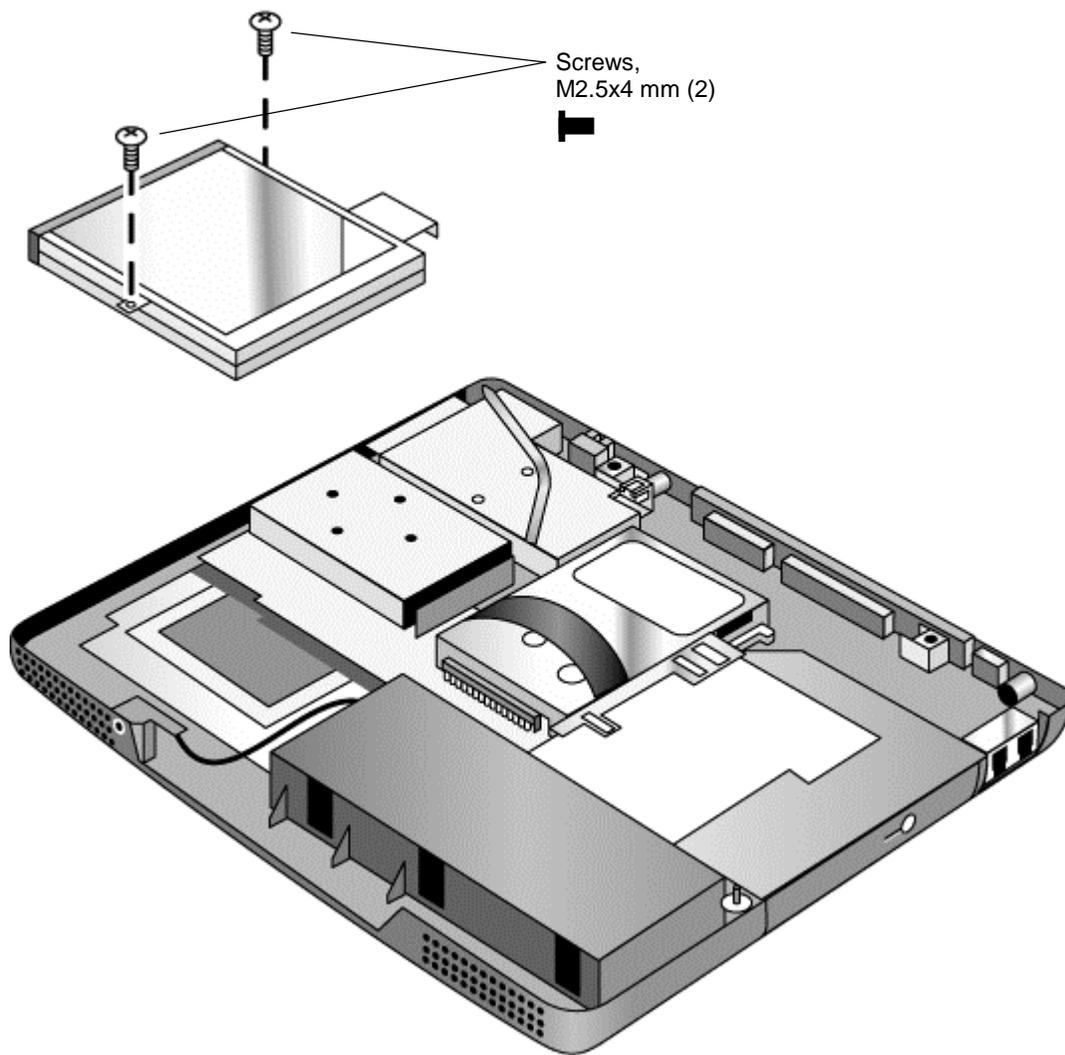
Figure 2-21. Removing the Floppy Disk Drive

Reassembly Notes

- 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 2-8).

    - Keyboard (page 2-10).

    - Hard disk drive (page 2-12).

    - Display assembly (page 2-16).

    - Top case (page 2-19).

    - Hinge saddle set (page 2-22).

2. Pull the drive to the right, off of its connector and out of the notebook.
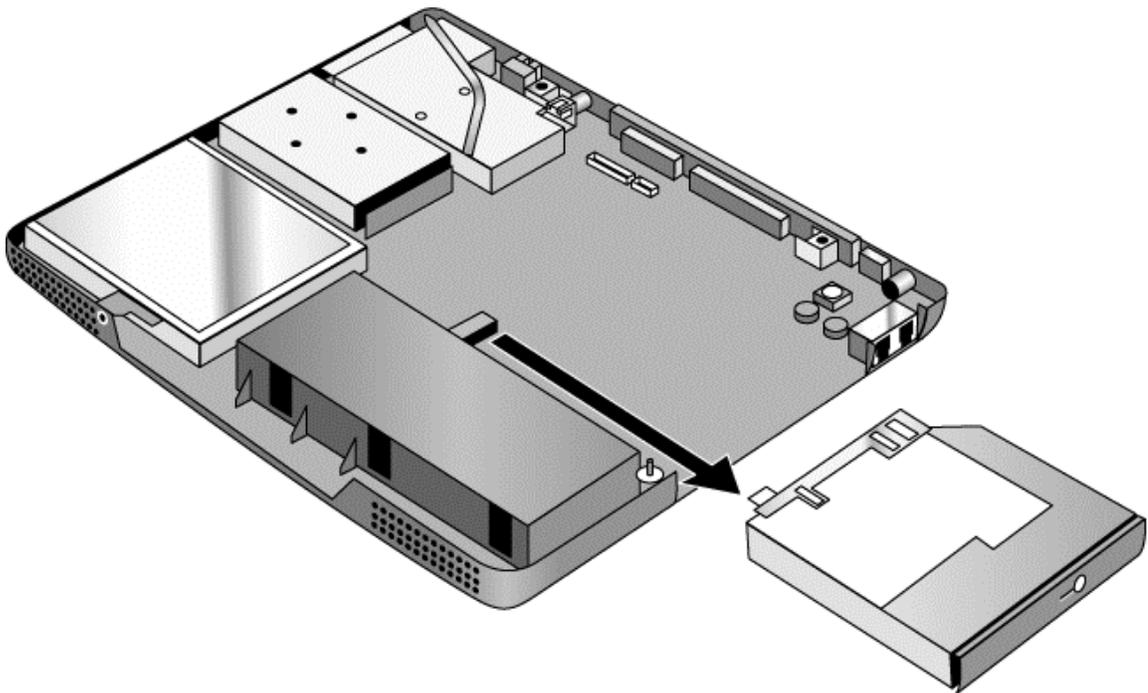
Figure 2-22. Removing the CD/DVD Drive

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:

   - For Windows 98, press F8 during reboot and select Command Prompt Only.

   - For Windows 2000 or XP, boot from a DOS boot floppy disk.

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 2-6).
   - Keyboard cover (page 2-8).
   - Keyboard (page 2-10).
   - Hard disk drive (page 2-12).
   - Display assembly (page 2-16).
   - Top case (page 2-19).
   - Hinge saddle set (page 2-22).
   - Heatsink assembly (page 2-24).
   - CPU module (page 2-26).
   - Floppy disk drive (page 2-29).
   - CD/DVD drive (page 2-31).
3. Remove all four 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.
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.
10. Remove the CPU support plate from the bottom case.

CPU standoff
screws, 5 mm (2)

Screw,
M2.5x5 mm (1)

Standoff screws, 5 mm (4)

Headphone
PCA

CPU support
plate

Screw,
M2.5x5 mm (1)

CD/DVD support
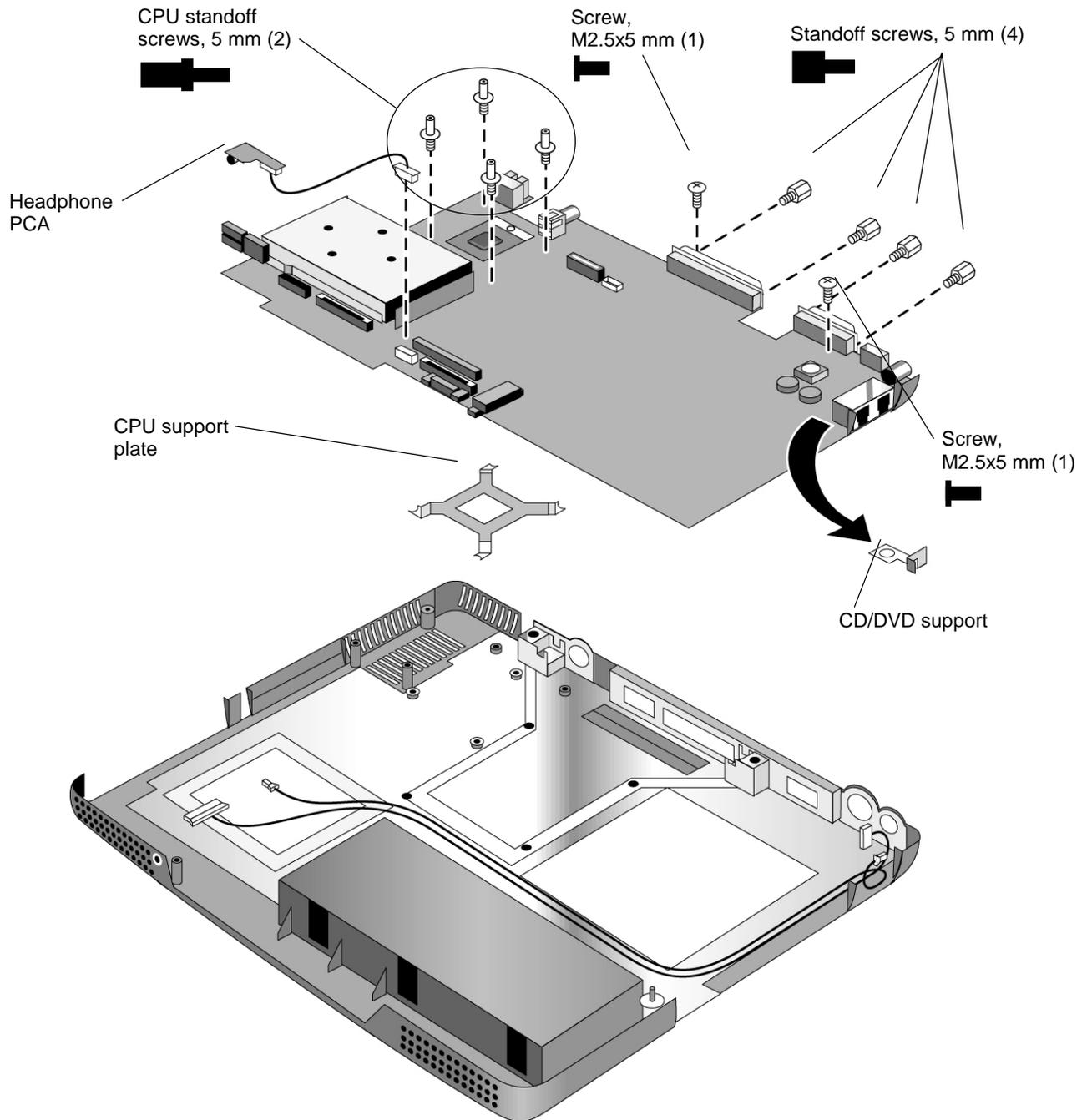
Figure 2-23. Removing the Motherboard

Reassembly Procedure

- When reinstalling the motherboard, see "Reinstalling the Motherboard" on page 2-35.

- When reinstalling the bottom case, see "Replacing the Bottom Case" on page 2-36.

Reinstalling the Motherboard

Reassembly Procedure

1. Install the CPU support plate.

2. 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.

3. Reconnect the cable (modem models only) or cables (modem/LAN models only) at the right rear corner of the motherboard.

4. 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, and set the video DIP switches for the notebook's display type.

1. Exit Windows and boot to a DOS prompt:

   - For Windows 98 or ME, press F8 during reboot and select Command Prompt Only.

   - For Windows 2000 or XP, boot from a DOS boot floppy disk.

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 the \hp\drivers\hputils directory and type **esn** at the prompt.

   – or –

   - Copy \hp\drivers\hputils\ESN.EXE from the *Recovery CDs*, 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.

4. Set the DIP switches on the motherboard to match the settings for the notebook's display type. See Table 2-8 on page 2-18.

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 docking or PCMCIA doors, refer to the figures below.
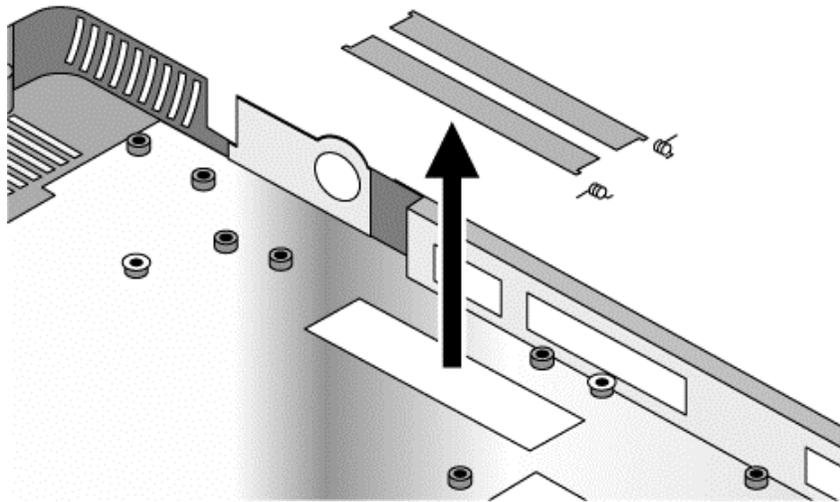
Figure 2-24. Installing Docking Doors
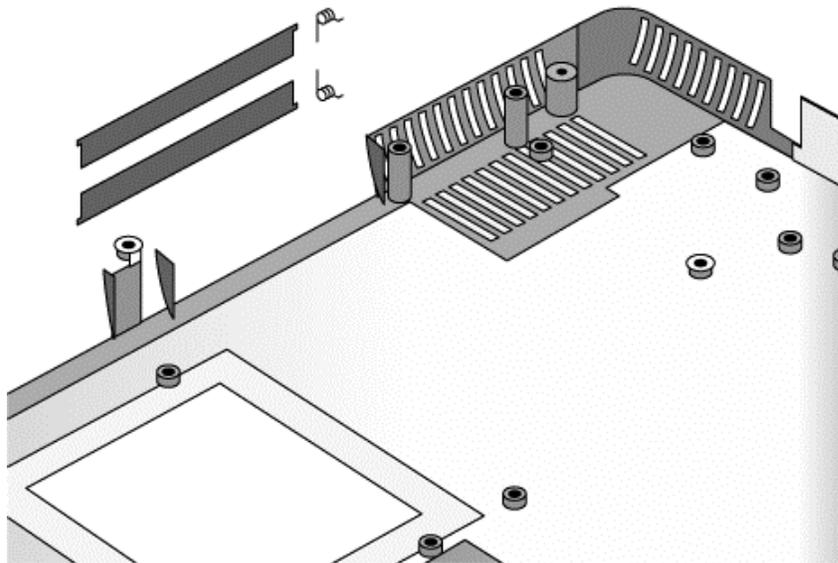
Figure 2-25. Installing the PCMCIA Doors

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.

> **HP Serial Number (S)TW711A1234   1YR**
> **(1P) F2072 W   EA   MFG# TW711A1234**
> Made in Taiwan
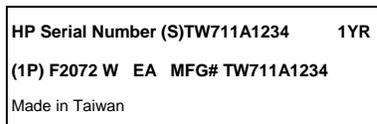
Figure 2-26. Example of Serial Number Label

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 2-10. Removing Notebook Components

Component	Removal Procedure	Additional Steps
Case, bottom	See page 2-32.	
Case, top	See page 2-19.	
Cover, keyboard	See page 2-8.	
CPU module	See page 2-26.	
Display assembly	See page 2-16.	
Doors, docking	Mini-PCI PCA (page 2-6). Keyboard cover (page 2-8). Keyboard (page 2-10). Hard disk drive (page 2-12). Display assembly (page 2-16). Top case (page 2-19). Hinge saddle set (page 2-22). Heatsink assembly (page 2-24). CPU module (page 2-26). Floppy disk drive (page 2-29). CD/DVD drive (page 2-31). Motherboard (page 2-32).	See the figure on page 2-36.

Component	Removal Procedure	Additional Steps
Doors, PCMCIA	Mini-PCI PCA (page 2-6). Keyboard cover (page 2-8). Keyboard (page 2-10). Hard disk drive (page 2-12). Display assembly (page 2-16). Top case (page 2-19). Hinge saddle set (page 2-22). Heatsink assembly (page 2-24). CPU module (page 2-26). Floppy disk drive (page 2-29). CD/DVD drive (page 2-31). Motherboard (page 2-32).	See the figure on page 2-37.
Drive, CD/DVD	See page 2-31.	
Drive, floppy disk	See page 2-29.	
Heatsink (with fan)	See page 2-24.	
Keyboard	See page 2-10.	
PCA, CD player	See page 2-21.	
PCA, headphone	Keyboard cover (page 2-8). Keyboard (page 2-10). Display assembly (page 2-16). Top case (page 2-19). Hinge saddle set (page 2-22).	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.
PCA, motherboard	See page 2-32.	
PCA, switchboard	Keyboard cover (page 2-8). Keyboard (page 2-10).	Remove both screws (M2.5x4 mm) from the PCA, and carefully lift the PCA off of the connector beneath it. *Be careful not to pull on the cable attached to the PCA.* Disconnect the cable from the PCA and remove the PCA from the notebook.

Component	Removal Procedure	Additional Steps

Plate, CPU support	Mini-PCI PCA (page 2-6).
	Keyboard cover
	  (page 2-8).
	Keyboard (page 2-10).
	Hard disk drive
	  (page 2-12).
	Display assembly
	  (page 2-16).
	Top case (page 2-19).
	Hinge saddle set
	  (page 2-22).
	Heatsink assembly
	  (page 2-24).
	CPU module (page 2-26).
	Floppy disk drive
	  (page 2-29).
	CD/DVD drive
	  (page 2-31).
	Motherboard (page 2-32).	

Saddle, hinge set	See page 2-22.	

Socket, PCMCIA	Keyboard cover
	  (page 2-8).
	Keyboard (page 2-10).
	Display assembly
	  (page 2-16).
	Top case (page 2-19).
	Hinge saddle set
	  (page 2-22).
		Remove the four screws attaching the PCMCIA socket to the motherboard (M2.5x5 mm), and remove the socket.

3

Troubleshooting and Diagnostics

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

- 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 3-23).
  - □ Power-on self-test (page 3-29).
  - □ Sycard PCCtest 450 PC Card (page 3-32).
  - □ Desktop/Windows Management Interface (page 3-33).
  - □ BIOS Setup utility (page 3-34).

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.

```
        ( )
         |
         v
+-----------------------------+
| Check the customer's        |
| description of the problem  |
| and any supporting          |
| information.                |
+-----------------------------+
         |
         v
+-----------------------------+
| Check for customer abuse.   |
+-----------------------------+
         |
         v
+-----------------------------+
| Try to duplicate the        |
| customer's problem.         |
+-----------------------------+
         |
         v
+-----------------------------+
| Troubleshoot the problem    |
| using:                      |
|   - Diagnostic tools.       |
|   - Troubleshooting         |
|     suggestions.            |
+-----------------------------+
         |
         v
+-----------------------------+
| Verify the repair by        |
| testing the functionality   |
| of the complete unit.       |
+-----------------------------+
         |
         v
        ( )
```
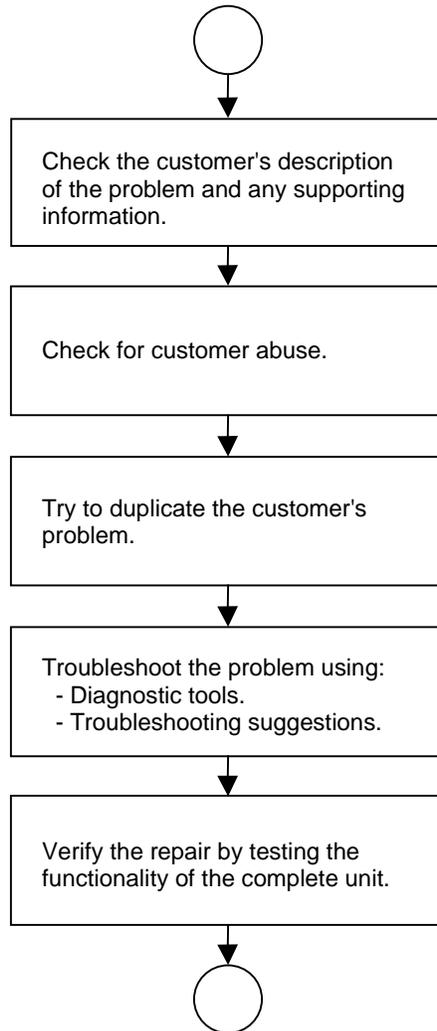
Figure 3-1. Basic Troubleshooting Steps

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 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 component responsible for the problem. A failure symptom is rarely caused by more than one component, so you will not usually need to replace more than one to correct a particular failure.

After you replace a component, 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 the following tests:

- **e-DiagTools Basic Diagnostic Test.** Run the basic test of the e-DiagTools diagnostic program (page 3-23).

  –and–

- **Function Tests.** Run tests that check the repaired function, such as in the e-DiagTools diagnostic program (page 3-23).

  –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
Bootup		Tests		Describes	Configures
Processor	Tests (System menu)	Tests		Describes	
Memory	Tests (Memory menu)	Tests		Describes	Describes
Batteries		Tests (CMOS battery only)		Describes (Win 98 only)	
Display	Tests (Video menu)			Describes	
Hard disk	Tests (IDE menu)	Tests		Describes	Describes
Floppy drive	Tests (FDD menu)	Tests		Describes	Describes
Keyboard	Tests (KBD menu)	Tests		Describes	
Pointer	Tests (Misc menu)			Describes	Configures
Audio	Tests (System, Misc menus)				
Parallel	Tests* (Misc menu)			Describes	
LAN				Describes	
Modem	Tests** (User menu)				
Infrared				Describes	Configures
PS/2 port	Tests† (KBD, Misc menus)				
USB	Tests† (USB menu)			Describes	
Docking port	Tests (System menu, using docks)				
PCMCIA	Tests* † (Misc menu)		Tests	Describes (Win 98 only)	
AC adapter				Status	
Docking products	Tests ports and internal bus			Status	
CD/DVD drive	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 1-16 and Table 1-7 on page 1-17.			
Startup			
Does not boot on AC or battery.	Check power source. Press system-off switch to reset notebook, then press blue standby button to turn notebook on. Unplug AC adapter, remove battery, remove any PC cards, undock, then reconnect power and try again. Remove all but one SDRAM module and try again. Reinsert any other SDRAM modules and try again.	AC adapter. SDRAM module. CPU module. Motherboard. Display assembly. Hard drive.	Check AC adapter. Remove any SDRAM modules and try again. If power status light does not turn on, replace motherboard. 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. 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 *Recovery CDs* to reinstall factory software onto hard drive; replace hard drive.
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.	Make sure battery is properly installed and fully charged. Check battery contacts. If available, try another battery.	Battery or contacts. Motherboard.	
Does not boot from floppy drive.	Make sure floppy disk is bootable. Make sure floppy drive is installed correctly. Use BIOS Setup to check boot order.	Floppy drive or contacts. Motherboard.	
Does not boot from CD in CD /DVD drive.	Make sure CD is bootable. Use BIOS Setup to check boot order. Restart notebook.	CD/DVD drive. Motherboard.	

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 *Recovery CDs* to reinstall factory software onto hard drive, replace hard drive.
Sluggish startup or shutdown.	Use the Windows disk-checking tools and Disk Defragmenter to check and optimize the 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.
Power/Battery			
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
Notebook has short operating time.	Turn down display brightness. Check timeout settings in Power Management or Power Options in Control Panel. 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. Certain applications can cause excess CPU and power usage. (User can get Intel Power Monitor from www.intel.com and monitor CPU load.) When playing DVD movies on battery power, make sure processor runs at optimum speed for movies: use Power Options or Power Management in Control Panel to select Portable/Laptop power scheme. When using applications with automatic save feature (such as MS Word), extend save time or disable to reduce hard disk access and power usage. PCMCIA card use can affect battery life. Some PCMCIA cards draw power even while not in use. Heavy modem use can affect battery operating time.	Battery. Motherboard.	Battery capacity often decreases after a year or more.
Battery indicator is inaccurate.	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.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Standby/resume			
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.		
Notebook hangs after going on standby or resuming.	Notebook may hang if docked or undocked while going on standby or resuming. Make sure notebook has completely finished going on standby or completely resumed before docking or undocking.		
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 Management or Power Options in Control Panel. Also, make sure the hibernate timeouts (Power Schemes tab) for AC and battery power are not set to Never.		
Standby option missing from Shut Down window.	Do not allow Windows 98 to disable APM. If it prompts you to do so, answer No. In System in Control Panel, expand System Devices (System Manager tab), and remove Advanced Power Management. Restart the computer, then use Add New Hardware in Control Panel to install support for APM. Restart the computer.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Display			
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 CPU module is installed properly. Try external monitor.	Display cable connection. SDRAM modules. CPU module. Display assembly. Motherboard.	Set DIP switch on motherboard to match label on display (see page 2-18). 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. Display assembly. Motherboard.	Check the display cable connection.
Bright or missing pixels or lines.	See quality statement on page 5-2.	Display cable connection. Display assembly.	Check the 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 an area on the screen.	Declared to be caused by customer abuse.
External display does not work.	Check connections. Press Fn+F5 several times. Try display on another computer.	External display. Motherboard.	
External display cannot use high resolution.	For Windows 98, use default display type for internal display: Default Monitor. If display type is changed, non-Plug-and-Play (non-DDC) external monitors cannot use resolutions higher than that of the internal display. Check display settings in Control Panel, or by right-clicking desktop and clicking Properties.		
Display difficult to read or part of desktop not visible.	Check display resolution (1024 × 768). Use HP Desktop Zoom to adjust size of desktop icons and labels.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
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.		
Image is not sharp when using TV-out port.	Notebook's TV-out port is optimized for DVD display. Performance may vary when using port for other applications.		
Hard disk			
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 surface using ScanDisk (Windows 98) or Tools tab in disk's Properties sheet (Windows 2000 or XP). Back up files if possible, then use *Recovery CDs* to reformat hard disk and reinstall factory software.		Use suggestions shown at left.
Disk capacity is less than normal.	Check disk surface using ScanDisk (Windows 98) or Tools tab in disk's Properties sheet (Windows 2000 or XP). Check partitions using FDISK (Windows 98) or Control Panel, Administrative Tools, Computer Management, Storage (Windows 2000) or Disk Management (Windows XP). Use *Recovery CDs* 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.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Floppy drive			
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.	
CD/DVD drive			
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. **Important:** most DVD drives allow the 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.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
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. For Windows 98, if using Extended Desktop (dual displays), move player window to display 1. 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.		
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.		
Keyboard			
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.	
Touch pad			
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 Mouse in Control Panel.	Top case. Motherboard.	
Touch pad does not work after detaching external mouse.	Restart the notebook. Put notebook in standby mode or shut down before detaching the mouse.		
Click button does not work.		Top case. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Mouse			
External mouse doesn't work.	Check connection. Put notebook in standby mode or shut down before attaching mouse. Install all drivers included with mouse. Restart notebook.	Mouse. Top case. Motherboard.	
Special feature on PS/2 mouse doesn't work.	Restart notebook. Install any drivers included with mouse. Check settings in BIOS Setup.		
Memory			
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 RAM.	Make sure SDRAM modules are installed properly.	SDRAM module.	
Audio			
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 the Volume Control, click Options, Properties, select Playback, and enable the microphone. Then make sure the 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).		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Parallel/USB			
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.	Parallel/USB device. Motherboard.	Use loop-back connector when testing parallel port—see page 3-25.
Modem			
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.	Check all cables and connections. Connect a standard telephone to the phone line and make sure the line is working. Try another telephone line, preferably one used for a fax machine or modem. If you're in a foreign country, the dial tone may not be recognized by the modem. In Control Panel, try disabling the option that waits for a dial tone. Phone message recording services provided by phone companies use "broken dial tone" to indicate waiting message. This can prevent notebook from detecting dial tone.	Mini-PCI PCA. Motherboard.	
Modem dials incorrectly.	Check number you entered, including digits required for outside access or long distance. Check dialing options in Control Panel—look for duplicate digits for outside access or long distance. In foreign country, modem may not recognize dial tone. In Control Panel, disable option that waits for dial tone. Disable call-waiting.		
Modem seems slow.	Check for excess line noise or static (often difficult to eliminate on international calls). Contact telephone company if needed. Disable call-waiting. Eliminate extra connections in the line. If possible, connect directly to wall jack. Try another telephone line, preferably one used for a fax machine or modem.	Mini-PCI PCA.	
Modem isn't detected.	Check modem setup in Control Panel. Check COM port. Open Device Manager. If modem is disabled, enable it. If conflict exists, try disabling another device. If running fax software using fax Class 2, try Class 1.	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.		
Excess line current detected.	Use analog telephone line, not PBX or digital line. In a hotel, ask for data line.		
General problems.	If 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.	
One-Touch button problems			
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.		
Printing			
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
LAN/Network			
General problems.	Check cables and connections. Try connecting computer to another network station (if applicable). 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. Check settings in Device Manager. If network adapter is disabled, enable it. If conflict exists, try disabling another device. Check settings in Control Panel. For Windows 98, open Network in Control Panel and make sure correct clients and protocols are installed. Use networking troubleshooter in Windows Help. 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).	Motherboard.	
Can't browse Network Neighborhood or My Network Places.	Check with network administrator to make sure network supports NetBEUI protocol. Use Windows Search to locate computer on network.		
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.		
Slow or dropped connections on 10/100 network switch or hub.	Switch may be forced to 10 Mbps. For Windows 98, use Network in Control Panel to disable Auto Polarity for network adapter.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Infrared			
General problems.	Make sure infrared is enabled in BIOS Setup. (Infrared is disabled by default.)	Motherboard.	
	Make sure default setup is modified as specified in HP Notes.		
	Make sure correct drivers are installed. In Device Manager, double-click Infrared devices, then double-click IrDA Fast Infrared Port. On Advanced tab, click Infrared Transceiver A in Property window, then select IBM 31T1100 from pull-down menu.		
	Make sure the line between the two infrared ports is not blocked, ports face each other squarely and are no more than 1 meter apart. Sunlight, heat from nearby equipment, or other sources of infrared radiation can cause transmission errors.		
	Make sure only one application is using infrared port.		
	Remove any PC Cards from notebook (possible IRQ conflict).		
	For fast-IrDA, check for DMA conflict with ECP parallel port.		
	For Windows 98, see c:\hp\drivers\fir\readme.txt for additional information.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
PC card			
Miscellaneous problems.	Remove and reinsert PC card. Restart notebook. Try card in other slot or in another computer. Check for conflicts or refresh device list in Device Manager. If card requires an IRQ, make sure one is available. Check HP Notebook web site for installation instructions and information about supported PC cards (see page vi). When using PC card in a docking system, insert or remove card while system is turned on. Download current drivers from card manufacturer's web site. Certain Xircom CE2 (IIps) LAN cards conflict with game port device in Windows 2000. Contact Xircom for details.	PC card. PCMCIA socket. Motherboard.	Using a flashlight, look for bent pins inside PCMCIA socket. If both slots have problems, replace motherboard. If only one slot has a problem, try replacing PCMCIA socket.
PC card modem not working.	Disable internal modem.		
Video file playback			
AVI or MPEG file doesn't play with two displays.	Before playing, press Fn+F5 to switch to one display. Cannot switch displays after play begins. If using both displays, video image will not appear on any display set up as "secondary". Open Display in Control Panel, click Advanced on Settings tab, and change settings.		
Resolution or color depth problems when playing an AVI or MPEG file.	Set the resolution or color depth before starting the video file player. You cannot change these settings after play begins. Some combinations of color depth and resolution are not supported in video file playback. If you receive an error message, reduce color depth or display resolution.		
Performance			
Clock loses time.	Plug in AC adapter for 24 hours to charge CMOS battery.	Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Notebook gets abnormally hot.	Always set notebook on a flat surface, so air can flow freely around and underneath it. Make sure air vents are clear. Check heatsink installation. Games and other programs that drive CPU usage toward 100% can contribute, as can charging battery.	Heatsink.	Check heatsink for proper fan operation or damage.
Notebook pauses or runs sluggishly.	May be normal Windows behavior (background processing can affect response time). Certain background operations (such as virus scanning software) can affect performance. Press Ctrl+Alt+Del to see if an application is not responding. Restart notebook. If hard disk has spun down to conserve power, it can take several seconds to spin up. If needed, use Power Management or Power Options in Control Panels to change hard disk time-out to match standby time-out. Some file browsers respond slowly while processing graphics or waiting for broken network connections to time out. Check for overheating—see previous symptom. 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 96 to 128 MB of SDRAM. Check available free disk space. Delete temporary and unneeded files.	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.	Press Ctrl+Alt+Del and end any application not responding. Slide and hold power switch four seconds to turn off and reset notebook, then press blue standby button to turn notebook back on. If this fails, insert a straightened paper clip into system-off switch, then press blue standby button to turn notebook back on.		
Port replicator			
Docking product I/O problems.	Make sure AC power is connected to port replicator. Make sure notebook is fully inserted in port replicator. Check notebook's power supply. Try using corresponding port on notebook while undocked.	Port replicator. Motherboard.	Test corresponding notebook ports while undocked. Port replicator is not repairable, and must be exchanged.
Notebook locks up when docking or undocking.	Make sure notebook has completely entered or resumed from standby or hibernate mode before docking or undocking.		
Port on port replicator isn't working.	Make sure notebook is docked properly. Reset the computer.	Port replicator.	

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 3-29).
- Sycard PCCtest 450 PC Card (page 3-32).
- Desktop/Windows Management Interface (page 3-33).
- BIOS Setup utility (page 3-34).

e-DiagTools Diagnostic Program

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

- Basic user-level hardware test.
- Advanced individual hardware tests.
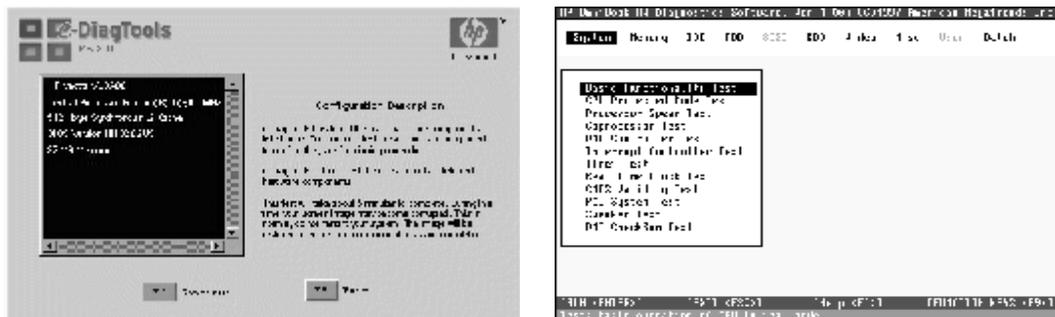
Figure 3-2. e-DiagTools Screens — Basic and Advanced

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 3-34.

---

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 3-26 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 parallel port test is more thorough if you connect a loop-back connector to the port before running the test for that port. See the wiring diagram below.
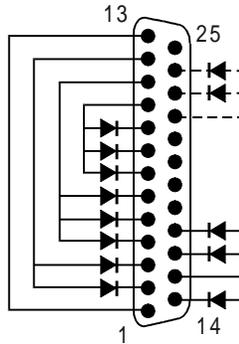
Figure 3-3. Parallel Loopback Connector

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
System Tests	
0001h – 0008h	Make sure the CPU module is seated properly. Replace the CPU module.
0009h	Replace the CPU module. Replace the motherboard.
0010h – 0016h	Make sure the CPU module is seated properly. Replace the CPU module.
001Eh – 002Fh	Make sure the CPU module is seated properly. Replace the CPU module. Replace the motherboard.
0030h – 0032h	Replace the motherboard.
0040h	Replace the motherboard.
0041h	Use the Device Manager to check IRQ assignments for all devices.
0050h – 0070h	Replace the motherboard.
0071h – 0076h	Reset the notebook, then run BIOS Setup and verify settings. Replace the motherboard.
0077h	Replace the motherboard.
0078h	Reset the notebook, then run BIOS Setup and verify settings. Replace the motherboard.
0079h – 008Ah	Replace the motherboard.
00C0h – 00CCh	Replace the CPU module.
Memory Tests	
The addresses below are absolute (32-bit) addresses, and are not in the segment:offset format.	
0100h – 0160h	Check the installation of the SDRAM modules. Replace the SDRAM modules (each 01000000h represents 16 MB). Replace the motherboard. Replace the CPU.
0182h	Unload HIMEM.SYS or any programs using the extended memory allocated by HIMEM.SYS.
0183h – 0190h	Check the installation of the SDRAM modules. Replace the SDRAM modules (each 01000000h represents 16 MB). Replace the motherboard. Replace the CPU.
01A0h – 01B3h	Replace the CPU. Replace the motherboard.
Hard Disk Tests	
0201h	Replace the hard disk. Replace the motherboard.
0202h – 0204h	Check test parameters and repeat the test. Replace the hard disk.
0205h	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.
0208h – 0209h	Repeat the test.

Code	Suggestions
020Ah – 0211h	Repeat the test. Run Windows disk-checking tools. Replace the hard disk.
0220h	Replace the motherboard.
0240h	Replace the hard disk. Replace the motherboard.
0252h – 0254h	Repeat the test. Replace the hard disk.
025Ah – 0260h	Repeat the test. Run Windows disk-checking tools. Replace the hard disk.
0265h	Check hard disk connection. Replace the hard disk. Replace the motherboard.
0275h	Replace the hard disk.
0280h	Check hard disk connection. Replace the hard disk. Replace the motherboard.
0281h	Replace the hard disk.
0290h	Repeat the test. Replace the hard disk.
0293h – 0296h	Replace the hard disk.
02AAh	Check hard disk connection. Replace the hard disk. Replace the motherboard.
02CCh	Repeat the test. Run BIOS Setup and check the hard disk type. Replace the hard disk. Replace the motherboard.
02EEh	Reset the notebook. Use BIOS Setup to return all settings to default values. Replace the hard disk.
02F1h	Use the *Recovery CDs* to reformat the hard disk and reinstall factory software.
02F3h	Run Windows disk-checking tools. Use the *Recovery CDs* to reformat the hard disk and reinstall factory software.
02F4h – 02F5h	Use the *Recovery CDs* to reformat the hard disk and reinstall factory software.
02FFh	Check the hard disk connection. Replace the hard disk. Replace the motherboard.
9602h – 9607h	(See Hard Disk Tests at end of table.)
Floppy Disk Tests	
0301h – 0304h	Replace the floppy drive. 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.
0306h	Replace the floppy drive.
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.
030Ch	Replace the floppy drive.

Code	Suggestions
Keyboard Tests	
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.
Parallel Port Tests	
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.
Audio Tests	
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.
Video Tests	
0900h – 0933h	Replace the motherboard.
2100h – 2102h	Replace the display assembly. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
2110h – 2120h	Replace the motherboard. Replace the display assembly.
2130h	Replace the display assembly. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
2140h – 2141h	Replace the motherboard. Replace the display assembly.
2150h	Replace the display assembly. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
9016h	Reset the notebook. Replace the motherboard.
9017h	See **Error! Bookmark not defined.** for cosmetic guidelines. If warranted, replace the display assembly.

Code	Suggestions
CD Tests	
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.
SMBUS Tests	
0E00h – 0E20h	Replace the motherboard.
TI CardBus Tests	
1201h	Remove any PCI cards 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.
USB Tests	
1301h – 1316h	Replace the motherboard.
9006h	(See USB Port Test below.)
ACPI Tests	
1701h – 1702h	Replace the motherboard.
DVD Tests	
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.
LAN/Modem Tests (3Com modem only)	
8000h	Repeat the test with the LAN cable/phone line unplugged. Replace the cable/phone line. Check the connections. Replace the motherboard.

Code	Suggestions
Fan Tests	
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.
Microphone Tests	
9003h	Replace the top case. Replace the motherboard.
9004h	Replace the motherboard.
USB Port Test	
9006h	Make sure a USB device is connected to the USB port being tested. Select the correct speed for the device. Try another USB device. Replace the motherboard (or dock component, if applicable).
IR Tests (FIR enabled, undocked)	
9002h	Reset the notebook. Replace the motherboard.
9007h – 9008h	Reset the notebook. Run BIOS Setup and restore default settings. Replace the motherboard.
9009h	Do not run this test in Windows. For the one-unit test, replace the motherboard. For the two-unit test, make sure the IR ports on the reflector and test computers are lined up and unobstructed. Replace the motherboard.
900Ah	Repeat the test. For the two-unit test, make sure the IR ports on the reflector and test computers are lined up and unobstructed. Replace the motherboard.
900Ch	Repeat the test. Make sure the IR ports on the reflector and test computers are lined up and unobstructed. Restart the reflector unit. Replace the motherboard.
Sound Tests	
9018h – 901Ah	If this error occurs for external headphone, replace the motherboard. Otherwise, check speaker connections. Replace the top case.

Code	Suggestions
Dock Tests	
9071h, 9073h	Update the notebook BIOS. Replace the dock's electronics PCA.
9075h, 9077h – 907Ah	Replace the dock's electronics PCA.
907Bh	Replace LED/button assembly in dock.
907Eh	Update the notebook BIOS. Replace the dock's electronics PCA.
9082h	Rerun test with known good computer. Replace electronics PCA in dock.
9085h	Restart the computer and repeat the test.
9088h	Replace electronics PCA in dock.
Hard Disk Tests	
9602h	Failure may occur soon. Back up data and replace the hard disk.
9603h	Repeat the hard disk test. If other errors occur, follow the instructions for those errors.
9604h	Back up data if possible, then reinstall applications. Use the *Recovery CDs* to reformat the hard disk and reinstall factory software.
9605h	Run the full HDD test, For a notebook that does not give an F10 prompt at boot (no Hibernate partition) or that has a non-Windows operating system, this error may not indicate a failure. Otherwise, use the *Recovery CDs* to reformat the hard disk and reinstall factory software.
9606h	Run the full HDD test. Use the *Recovery CDs* to reformat the hard disk and reinstall factory software.
9607h	Back up data if possible, then use the *Recovery CDs* to reformat the hard disk and reinstall factory software. Replace the hard disk.

Power-On Self-Test

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, port replicator, PC cards, printer, external monitor, pointing device, and keyboard.

2. Provide "clean" AC power—no auto adapter or unusual AC adapter configuration.

3. Press the 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 motherboard DIP switches) 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
0200 Failure Fixed Disk	
	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.
0210 Stuck key	
	A key is stuck on the keyboard.
0211 Keyboard error	
	The keyboard is not working.
0212 Keyboard Controller Failed	
	The keyboard controller failed its test. The motherboard may need to be replaced (it contains the keyboard controller).
0213 Keyboard locked – Unlock key switch	
	Unlock the system to proceed.
0220 Monitor type does not match CMOS – Run SETUP	
	The monitor type is not correctly identified in BIOS Setup.
0230 Shadow RAM Failed at offset: *nnnn*	
	Shadow RAM failed at offset *nnnn* of the 64k block at which the error was detected.
0231 System RAM Failed at offset: *nnnn*	
	System RAM failed at offset *nnnn* of the 64k block at which the error was detected.
0232 Extended RAM Failed at offset: *nnnn*	
	Extended memory is not working or not configured properly at offset *nnnn*. Update to the latest BIOS version.
0250 System battery is dead – Replace and run SETUP	
	The CMOS clock battery indicator shows that the battery is dead. Connect the AC adapter for at least 24 hours. Replace the CMOS battery. Replace the motherboard.
0251 System CMOS checksum bad – Default configuration used	
	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.
0260 System timer error	
	The timer test failed. Replace the motherboard.
0270 Real time clock error	
	The real-time clock failed the BIOS test. The motherboard may need to be replaced.
0280 Previous boot incomplete – Default configuration used	
	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.
0281 Memory Size found by POST differed from CMOS	
	The memory size found by POST differed from CMOS.
02B0 Diskette drive A error	
02B1 Diskette drive B error	
	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.
02B2 Incorrect Drive A type – run SETUP	
	The type of floppy drive A: is not correctly identified in BIOS Setup.
02B3 Incorrect Drive B type – run SETUP	
	The type of floppy drive B: is not correctly identified in BIOS Setup.
02D0 System cache error – Cache disabled	
	The RAM cache failed and BIOS disabled the cache. The CPU may need to be replaced. A disabled cache slows system performance considerably.
02F0: CPU ID:	
	CPU socket number for Multi-Processor error.
02F4: EISA CMOS not writeable	
	ServerBIOS2 test error: Cannot write to EISA CMOS.
02F5: DMA Test Failed	
	ServerBIOS2 test error: Cannot write to extended DMA (Direct Memory Access) registers.
02F6: Software NMI Failed	
	ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Message	Description
02F7: Fail-Safe Timer NMI Failed	
	ServerBIOS2 test error: Fail-Safe Timer takes too long.
***device* Address Conflict**	
	Address conflict for specified device.
Allocation Error for: *device*	
	Resolve the resource conflict for the specified device.
CD ROM Drive	
	CD ROM Drive identified.
Entering SETUP ...	
	Starting the BIOS Setup program.
Failing Bits: *nnnn*	
	The hex number *nnnn* 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.
Fixed Disk *n*	
	Fixed disk *n* (0–3) identified.
Invalid System Configuration Data	
	Problem with NVRAM (CMOS) data.
I/O device IRQ conflict	
	An I/O device has an IRQ conflict.
PS/2 Mouse Boot Summary Screen:	
	A PS/2 mouse is installed.
***nnnn* kB Extended RAM Passed**	
	Where *nnnn* is the amount (in KB) of SDRAM successfully tested.
***nnnn* Cache SRAM Passed**	
	Where *nnnn* is the amount (in KB) of system cache successfully tested.
***nnnn* kB Shadow RAM Passed**	
	Where *nnnn* is the amount (in KB) of shadow RAM successfully tested.
***nnnn* kB System RAM Passed**	
	Where *nnnn* is the amount (in KB) of system RAM successfully tested.
Operating system not found	
	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.
Parity Check 1 *nnnn*	
	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 ????.
Parity Check 2 *nnnn*	
	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 ????.
Press <F1> to resume, <F2> to Setup, <F3> for previous	
	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.
Press <F2> to enter Setup	
	Optional message displayed during POST.
PS/2 Mouse:	
	A PS/2 mouse was identified.
System BIOS shadowed	
	System BIOS was copied to shadow RAM.
UMB upper limit segment address: *nnnn*	
	Displays the address *nnnn* of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS that can be reclaimed by a virtual memory manager.
Video BIOS shadowed	
	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)
XE3/N5000 (technology code GF)	Upper	PCT450 -1 -ba6 51;v-	TESTCB -1 -b56 -v -p -jsd000 :0 -k3
	Lower	PCT450 -0 -ba6 51;v-	TESTCB -0 -b56 -v -p -jsd000 :0 -k3

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 preloaded on the hard disk:

- In Windows, click Start, Programs (or 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.

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

Uninstalling the DMI Package

1. Click Start, Programs (or All Programs), HP TopTools for Notebooks, Uninstall DMI (Windows 98) or Uninstall WMI (Windows 2000 or XP).

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: Introduced with BIOS version GF.M1.01 (Windows XP) or GF.M1.02 (Windows 98 and 2000) (Autumn 2000).		
Main Menu	**Description**	**Default**
BIOS Revision	Shows the current BIOS version.	Detected automatically.
UUID number	Displays the value of the 16-byte UUID (Universally Unique ID) as 32 hex characters.	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.	
Diskette A	Sets the floppy drive type.	Detected and set automatically.
Internal Hard Disk	Sets the hard disk drive type and various drive parameters.	Detected and set automatically.
Extended Memory	Shows the extended memory size.	Detected automatically.
Television Type	NTSC or PAL standard.	NTSC

System Devices Menu	Description	Default
PS/2 Pointing Devices	Enables (Both) or disables (Auto) the internal pointing devices when an external PS/2 mouse is connected.	Auto
Infrared Port (selected models)	Enables the infrared port (the port is configured by the user).	Disabled
Base I/O address	Sets the I/O address.	2F8h
Interrupt	Sets the I/O interrupt.	IRQ3
Mode	Sets the port to FIR (fast infrared) or SIR (standard infrared) communications.	FIR
DMA channel	Sets the DMA channel for the infrared port in FIR mode.	DMA1
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)
Security Menu	**Description**	**Default**
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	Sets, changes, or clears 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.	
Set Administrator Password	Sets, changes, or clears 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.	
Password Required to Boot	Sets whether a user password is required when the notebook boots. Requires the administrator password for changes.	Disabled
Boot Menu	**Description**	**Default**
	Shows the order of boot devices. Move the entries (press F5 and F6) to change the order.	1. Hard Drive 2. CD-ROM Drive 3. Removable Devices
Exit Menu	**Description**	
Exit Saving Changes	Saves Setup changes to CMOS, then exits and restarts.	
Exit Discarding Changes	Discards any Setup changes made since last save, then exits and reboots. Does not affect security, date, or time changes.	
Load Setup Defaults	Restores default settings, and remains in Setup. Does not affect security, date, or time changes.	

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 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).

4

Replaceable Parts

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

- Replaceable parts (page 4-3).
- Accessory replaceable parts (page 4-5).
- Part number reference (page 4-6).
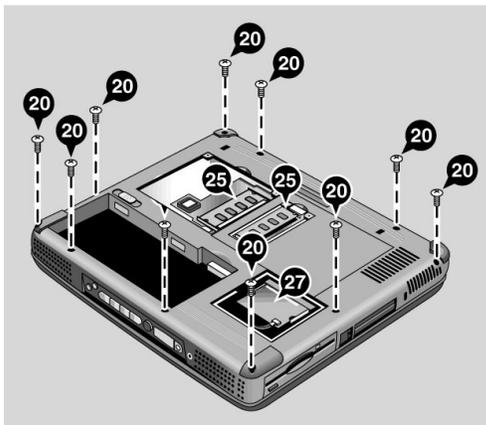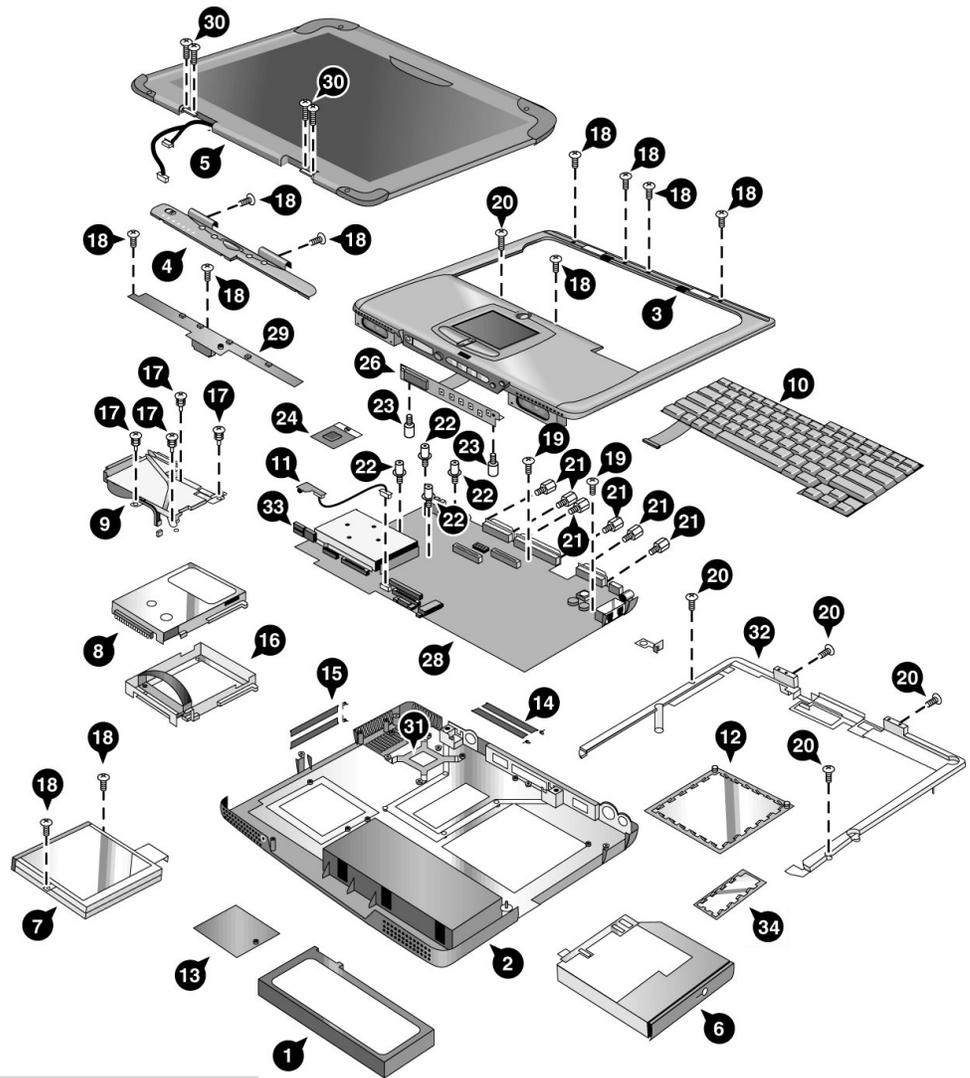
Figure 4-1. Exploded View

Table 4-1. Replaceable Parts

	Description	Part Number	Exchange Part Number	User-Repl.
1	Battery, LiIon (9 cell)	F3925-60901		Yes
1	Battery, LiIon (6 cell)	F3925-60902		Yes
1	Battery, NiMH	F3925-60903		Yes
2	Case, bottom (full-featured, modem or modem/LAN, w/ IEEE 1394)	F3925-60961		No
2	Case, bottom (full-featured, modem or modem/LAN, w/o IEEE 1394)	F3925-60963		No
2	Case, bottom (defeatured, modem or modem/LAN, w/o IEEE 1394)	F3925-60964		No
3	Case, top (defeatured)	F3925-60924		No
3	Case, top (full- featured)	F3925-60925		No
4	Cover, keyboard (w/o RF)	F3925-60915		Yes
5	Display, 13.3-in TFT	F3925-60906	F3925-69006	No
5	Display, 14.1-in TFT	F3925-60904	F3925-69004	No
5	Display, 15-in TFT	F3925-60905	F3925-69005	No
5	Display, 15.0-in SXGA+	F3925-60907	F3925-69007	No
6	Drive, CD	F3925-60936		No
6	Drive, CD-RW (8x)	F3925-60937		No
6	Drive, DVD/CD-RW Combo	F3925-60939		No
6	Drive, DVD	F3925-60938		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)	F3925-60928		No
10	Keyboard, Arabic/English	F2111-60938		No
10	Keyboard, Belgian	F2111-60930		No
10	Keyboard, Chinese	F2111-60931		No
10	Keyboard, Czech	F2111-60928		No
10	Keyboard, Danish	F2111-60920		No
10	Keyboard, French	F2111-60917		No
10	Keyboard, French Canadian	F2111-60923		No
10	Keyboard, German	F2111-60925		No
10	Keyboard, Greek	F2111-60929		No
10	Keyboard, Hebrew	F2111-60936		No
10	Keyboard, Hungarian	F2111-60937		No
10	Keyboard, Iceland	F2300-60902		No
10	Keyboard, International English	F2111-60926		No

	Description	Part Number	Exchange Part Number	User-Repl.
10	Keyboard, Italian	F2111-60918		No
10	Keyboard, Japanese	F2111-60935		No
10	Keyboard, Norwegian	F2111-60921		No
10	Keyboard, Portuguese	F2111-60933		No
10	Keyboard, Russian	F2111-60934		No
10	Keyboard, Spanish	F2111-60919		No
10	Keyboard, Swedish	F2111-60924		No
10	Keyboard, Swiss	F2111-60922		No
10	Keyboard, Turkish	F2111-60927		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)	F3925-60966		No
	Kit, cables (includes modem cable, LAN cable, audio cable, and headphone PCA)	F3925-60945		No
11	PCA, headphone	(see above kit)		
	Kit, covers	F3925-60920		No
12	Cover, SDRAM, primary	(see above kit)		No
13	Cover, mini-PCI	(see above kit)		No
14	Doors, docking (with springs)	(see above kit)		No
15	Doors, PCMCIA (with springs)	(see above kit)		No
34	Cover, SDRAM, secondary	(see above kit)		No
17	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
	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	Module, CPU (Pentium III-M, 866 MHz Tualatin)	F3950-60901	F3950-69101	No
24	Module, CPU (Pentium III, 933 MHz Tualatin)	F3257-60904	F3257-69004	No
24	Module, CPU (Pentium III-M, 1.06 GHz Tualatin)	F3941-60901	F3941-69101	No
24	Module, CPU (Pentium III, 1.13 GHz Tualatin)	F3257-60906	F3257-69006	No
24	Module, CPU (Celeron-T, 800 MHz Tualatin)	F3943-60901	F3943-69101	No
24	Module, CPU (Celeron-T, 866 MHz Tualatin)	F3944-60901	F3944-69101	No
24	Module, CPU (Celeron-T, 933 MHz Tualatin)	F3946-60901	F3946-69101	No
25	Module, SDRAM, 128 MB, PC133 SODIMM	1818-8504		Yes
25	Module, SDRAM, 256 MB, PC133 SODIMM	1818-8635		Yes
26	PCA, CD player	F3925-60919		No

	Description	Part Number	Exchange Part Number	User-Repl.
27	PCA, mini-PCI (modem)	F3377-60950		Yes
28	PCA, motherboard (XGA full-featured. w/IEEE 1394)	F3925-60955	F3925-69055	No
28	PCA, motherboard (SXGA+ full-featured w/IEEE 1394)	F3925-60956	F3925-69056	No
28	PCA, motherboard (SXGA+ full-featured w/o IEEE 1394)	F3925-60958	F3925-69058	No
28	PCA, motherboard (XGA defeatured w/o IEEE 1394)	F3925-60959	F3925-69059	No
28	PCA, motherboard (XGA full-featured w/o IEEE 1394)	F3925-60978	F3925-69078	No
29	PCA, switchboard	F2111-60941		No
31	Plate, CPU support	F2111-60966		No
32	Set, hinge saddle	F2111-60948		No
	Hinge saddle (left)	F3925-60926		No
	Set, thermal pad	F2111-60952		No
33	Socket, PCMCIA (2-slot)	F2111-60960		No

Table 4-2. Accessory Replaceable Parts

Description	Part Number	Exchange Part Number	User Repl.
3Com Bluetooth PC Card	F2196-80001		Yes
AC adapter, Ultraslim (60W, 19V output)	0950-3988		Yes
AC adapter, Ultraslim (60W, 19V output)	0950-4207		Yes
Adapter, auto (72W, Europe Only)	F2297-80001		Yes
Horn PS/2 US Keyboard	F2291-60902		Yes
Module, SDRAM, 128 MB, PC133 SODIMM	1818-8504		Yes
Module, SDRAM, 256 MB, PC133 SODIMM	1818-8635		Yes
Polk AMR 50 Speakers	F2291-60903		Yes
Power cord, replacement (Argentina)	8120-8367		Yes
Power cord, replacement (Australia/New Zealand)	8120-6312		Yes
Power cord, replacement (Chile)	8120-8452		Yes
Power cord, replacement (Europe/Israel/Egypt/ Saudi Arabia)	8120-6314		Yes
Power cord, replacement (Hong Kong, Singapore, U.K.)	8120-8699		Yes
Power cord, replacement (India)	8121-0702		Yes
Power cord, replacement (Japan)	8120-6316		Yes
Power cord, replacement (People's Rep. Of China)	8120-8373		Yes
Power cord, replacement (S. Africa)	8120-6317		Yes
Power cord, replacement (U.S./Canada/Taiwan/ Mexico/Philippines)	8120-6313		Yes
PS/2 2 Button Scrolling Mouse	F2291-60901		Yes
Simple port replicator	F2111-60967		Yes

Table 4-3. Part Number Reference

Part Number	Exchange Part Number	Description	User Repl.
0950-3988		AC adapter, Ultraslim (60W, 19V output)	Yes
0950-4207		AC adapter, Ultraslim (60W, 19V 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
1818-8635		Module, SDRAM, 256 MB, PC133 SODIMM	Yes
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
F1660-60912	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	F1664-69002	Drive, hard disk (10 GB, 9.5 mm, Hitachi)	No
F2072-60908	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
F2111-60915		Keyboard, U.S. English	No
F2111-60916		Keyboard, U.K. English	No
F2111-60917		Keyboard, French	No
F2111-60918		Keyboard, Italian	No
F2111-60919		Keyboard, Spanish	No
F2111-60920		Keyboard, Danish	No
F2111-60921		Keyboard, Norwegian	No
F2111-60922		Keyboard, Swiss	No
F2111-60923		Keyboard, French Canadian	No
F2111-60924		Keyboard, Swedish	No
F2111-60925		Keyboard, German	No
F2111-60926		Keyboard, International English	No
F2111-60927		Keyboard, Turkish	No
F2111-60928		Keyboard, Czech	No
F2111-60929		Keyboard, Greek	No
F2111-60930		Keyboard, Belgian	No
F2111-60931		Keyboard, Chinese	No
F2111-60933		Keyboard, Portuguese	No

Part Number	Exchange Part Number	Description	User Repl.
F2111-60934		Keyboard, Russian	No
F2111-60935		Keyboard, Japanese	No
F2111-60936		Keyboard, Hebrew	No
F2111-60937		Keyboard, Hungarian	No
F2111-60938		Keyboard, Arabic/English	No
F2111-60941		PCA, switchboard	No
F2111-60948		Set, hinge saddle	No
F2111-60952		Set, thermal pad	No
F2111-60956		Kit, hard disk drive carrier (includes bracket, strap, connector, mounting screws)	No
F2111-60960		Socket, PCMCIA (2-slot)	No
F2111-60966		Plate, CPU support	No
F2111-60967		Simple port replicator	Yes
F2111-60980	F2111-69080	Display, 13.3-in TFT	No
F2196-80001		3Com Bluetooth PC Card	Yes
F2291-60901		PS/2 2 Button Scrolling Mouse	Yes
F2291-60902		Horn PS/2 US Keyboard	Yes
F2291-60903		Polk AMR 50 Speakers	Yes
F2297-80001		Adapter, auto (72W, Europe Only)	Yes
F2300-60902		Keyboard, Iceland	No
F2332-60903	F2332-69003	Drive, hard disk (30 GB, 9.5 mm, Toshiba ATA66)	No
F3257-60904	F3257-69004	Module, CPU (Pentium III, 933 MHz Tualatin)	No
F3257-60906	F3257-69006	Module, CPU (Pentium III, 1.13 GHz Tualatin)	No
F3377-60950		PCA, mini-PCI (modem)	Yes
F3925-60901		Battery, LiIon (9 cell)	Yes
F3925-60902		Battery, LiIon (6 cell)	Yes
F3925-60903		Battery, NiMH	Yes
F3925-60904	F3925-69004	Display, 14.1-in TFT	No
F3925-60905	F3925-69005	Display, 15-in TFT	No
F3925-60906	F3925-69006	Display, 13.3-in TFT	No
F3925-60907	F3925-69007	Display, 15.0-in SXGA+	No
F3925-60915		Cover, keyboard (w/o RF)	Yes
F3925-60919		PCA, CD player	No
F3925-60920		Kit, covers	No
F3925-60924		Case, top (defeatured)	No
F3925-60925		Case, top (full- featured)	No
F3925-60926		Hinge saddle (Left)	No
F3925-60928		Heatsink assembly (with fan)	No
F3925-60935		Drive, floppy disk	No
F3925-60936		Drive, CD	No
F3925-60937		Drive, CD-RW (8x)	No
F3925-60938		Drive, DVD	No
F3925-60939		Drive, DVD/CD-RW Combo	No

Part Number	Exchange Part Number	Description	User Repl.
F3925-60945		Kit, cables (includes modem cable, LAN cable, audio cable, and headphone PCA)	No
F3925-60955	F3925-69055	PCA, motherboard (XGA full-featured w/IEEE 1394)	No
F3925-60956	F3925-69056	PCA, motherboard (SXGA+ full- featured w/IEEE 1394)	No
F3925-60958	F3925-69058	PCA, motherboard (SXGA+ full- featured w/o IEEE 1394)	No
F3925-60959	F3925-69059	PCA, motherboard (XGA defeatured w/o IEEE 1394)	No
F3925-60961		Case, bottom (full-featured, modem or modem/LAN, w/IEEE 1394)	No
F3925-60963		Case, bottom (full-featured, modem or modem/LAN, w/o IEEE 1394)	No
F3925-60964		Case, bottom (defeatured, modem or modem/LAN, w/o IEEE 1394)	No
F3925-60966		Kit, base labels (XE3—includes rating label, safety label, business card holder, barcode overlay)	No
F3925-60975		Kit, LCD screw covers (includes covers for all display sizes)	Yes
F3925-60976		Kit, screws (includes all screws needed to replace all notebook FRUs)	No
F3925-60978	F3925-69078	PCA, motherboard (XGA full-featured w/o IEEE 1394)	No
F3940-60905		Recovery CDs, Australian English, Windows XP Home Edition (mfg p/n F3940-12005)	No
F3941-60901	F3941-69101	Module, CPU (Pentium IIIM, 1.06 GHz Tualatin)	No
F3943-60901	F3943-69101	Module, CPU (Celeron-T, 800 MHz Tualatin)	No
F3944-60901	F3944-69101	Module, CPU (Celeron-T, 866 MHz Tualatin)	No
F3944-60901		Recovery CDs, N. American English, Windows XP Home Edition (mfg p/n F3944-12001)	No
F3944-60902		Recovery CDs, International English, Windows XP Home Edition (mfg p/n F3944-12002)	No
F3944-60903		Recovery CDs, French, Windows XP Home Edition (mfg p/n F3944-12003)	No
F3944-60904		Recovery CDs, Italian, Windows XP Home Edition (mfg p/n F3944-12004)	No
F3944-60905		Recovery CDs, German, Windows XP Home Edition (mfg p/n F3944-12005)	No
F3944-60906		Recovery CDs, Spanish, Windows XP Home Edition (mfg p/n F3944-12006)	No
F3944-60907		Recovery CDs, Swedish/English, Windows XP Home Edition (mfg p/n F3944-12007)	No
F3944-60908		Recovery CDs, French/German, Windows XP Home Edition (mfg p/n F3944-12008)	No
F3944-60909		Recovery CDs, Japanese, Windows XP Home Edition (mfg p/n F3944-12009)	No
F3944-60910		Recovery CDs, Dutch/English, Windows XP Home Edition (mfg p/n F3944-12010)	No
F3944-60911		Recovery CDs, Finnish/English, Windows XP Home Edition (mfg p/n F3944-12011)	No
F3944-60912		Recovery CDs, N. American English, Windows XP Professional Edition (mfg p/n F3944-12012)	No

Part Number	Exchange Part Number	Description	User Repl.
F3944-60913		Recovery CDs, International English, Windows XP Professional Edition (mfg p/n F3944-12013)	No
F3944-60915		Recovery CDs, Italian, Windows XP Professional Edition (mfg p/n F3944-12015)	No
F3944-60916		Recovery CDs, German, Windows XP Professional Edition (mfg p/n F3944-12016)	No
F3944-60917		Recovery CDs, Spanish, Windows XP Professional Edition (mfg p/n F3944-12017)	No
F3944-60918		Recovery CDs, Swedish, Windows XP Professional Edition (mfg p/n F3944-12018)	No
F3944-60919		Recovery CDs, Japanese, Windows XP Professional Edition (mfg p/n F3944-12019)	No
F3944-60920		Recovery CDs, Finnish/English, Windows XP Professional Edition (mfg p/n F3944-12020)	No
F3946-60901	F3946-69101	Module, CPU (Celeron-T, 933 MHz Tualatin)	No
F3950-60901	F3950-69101	Module, CPU (Pentium IIIM, 866 MHz Tualatin)	No

5

Reference Information

This chapter includes the following reference information:

- Password removal policy.
- Display quality statement.

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.

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
Electrical Imperfections: Bright dots [a] Dark dots [a]	• 7 or more single bright dots. • 7 or more single dark dots. • 9 or more total (bright and dark combined) defective dots. • Any occurrence of multiple defective dots within 15 mm.
Mechanical Imperfections: Discoloration Polarizer bubbles, dents [b], scratches	• Any polarizer bubble, discoloration, or dent that is visible from at least 36 cm (14 in).
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.	

Part Number (P)F2113-90026