HP OmniBook XE3

Service Manual

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Edition History

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Introduction

This manual provides reference information for servicing the HP OmniBook XE3 notebook PC. 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 http://www.europe.hp.com/notebooks (European mirror)	No usage restriction.
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-ROM	(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.

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Product Information

The OmniBook XE3 series is HP's value 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 at a wide range of prices. It also incorporates several new technologies and an enhanced industrial design for greater ease-of-use, quality, and reliability.

Table 1-1. OmniBook XE3 Series Models

Product [1]	CPU [2]	Display	Hard Drive	Standard SDRAM	CD-ROM/DVD (max. speed)	Mini-PCI Card [3]	Battery	OS [4]
F2112X	Celeron 550 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	Modem	NiMh	98/2K
F2113X	Celeron 600 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	Modem	LiIon	98/2K
F2114X	Pentium III 650 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	Modem	LiIon	98/2K
F2115X	Celeron 650 MHz	14.1-in TFT XGA	5 GB	64 MB	8x DVD	Modem/LAN	LiIon	98/2K
F2116X	Pentium III 700 MHz	14.1-in TFT XGA	10 GB	64 MB	8x DVD	Modem/LAN	LiIon	98/2K
F2117X	Pentium III 700 MHz	15.0-in TFT XGA	10 GB	64 MB	8x DVD	Modem/LAN	LiIon	98/2K
F2118X	Pentium III 700 MHz	15.0-in TFT XGA	10 GB	128 MB	8x DVD	Modem/LAN	LiIon	98/2K
F2119X [5]	Celeron 600 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	Modem/LAN	LiIon	98/2K
F2120X [5]	Pentium III 650 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	Modem/LAN	LiIon	98/2K
F2121X [6]	Celeron 600 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	None	LiIon	98/2K
F2122X [6]	Pentium III 650 MHz	12.1-in TFT SVGA	5 GB	64 MB	24x CD-ROM	None	LiIon	98/2K
F2123X [6]	Celeron 650 MHz	14.1-in TFT XGA	5 GB	64 MB	8x DVD	None	LiIon	98/2K
F2124X [6]	Pentium III 700 MHz	15.0-in TFT XGA	10 GB	64 MB	8x DVD	None	LiIon	98/2K
F2126X [7]	Celeron 600 MHz	14.1-in TFT XGA	10 GB	64 MB	24x CD-ROM	Modem/LAN	LiIon	98/2K

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

1 For the products listed:
"*x*" suffix means
"W", "WT", or "WG" for Windows 95 or Windows 98 installed, or
"K", "KT", or "KG" for Windows 2000 installed (marketing distinction only).

2 Intel Mobile Pentium III or Intel Mobile Celeron processor.

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

4 OS = Windows 98 (98), Windows 2000 (2K), or Windows Millennium Edition (ME).

5 North America (U.S.) only.

6 Europe only (modemless).

7 Japan 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, **GC**.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
GC	OmniBook XE3 Pavilion Notebook N5130/50/70/90/95	Initial platform technology.

Features

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

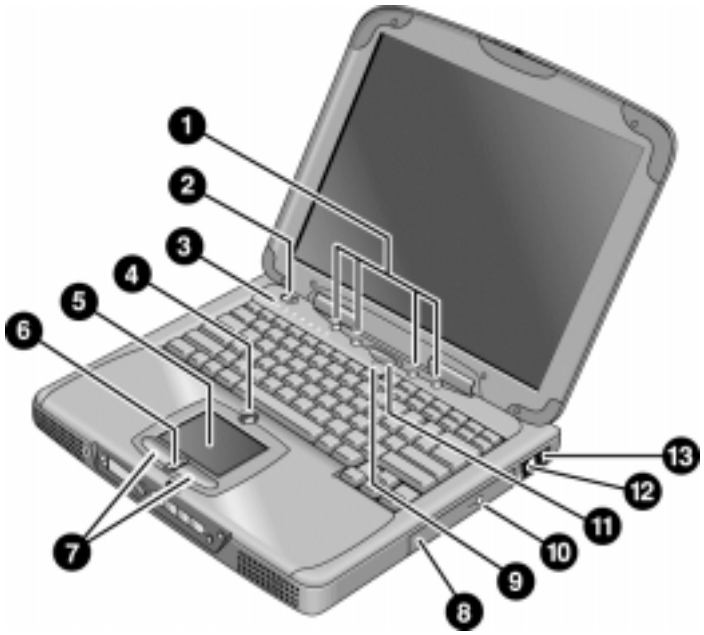

Figure 1-1. Top/Right View

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

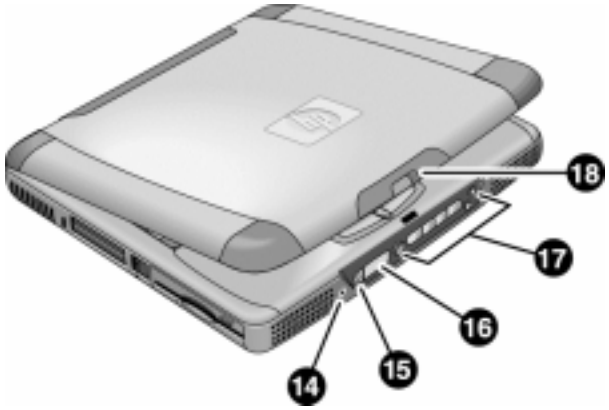

Figure 1-2. Front View

14. Headphone jack.
15. Status panel mode select button.
16. Status panel.
17. Multimedia buttons.
18. Latch (to open display).

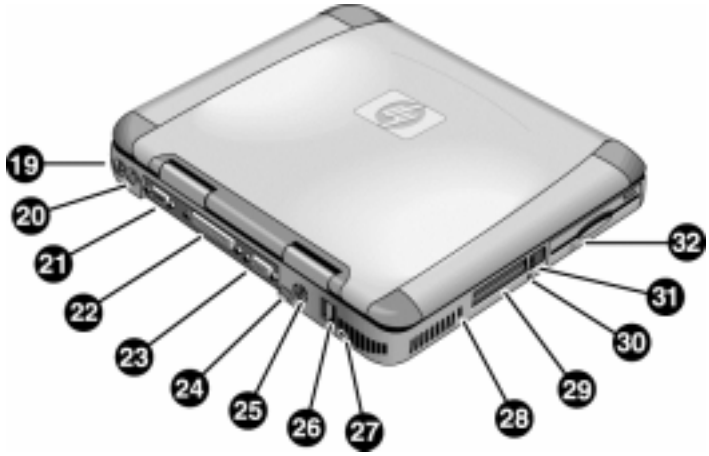

Figure 1-3. Rear/Left View

19. AC adapter jack.
20. PS/2 port (external mouse or keyboard).
21. Serial port.
22. Parallel port.
23. VGA port (external monitor).
24. Infrared port.
25. TV output port.
26. Two 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.

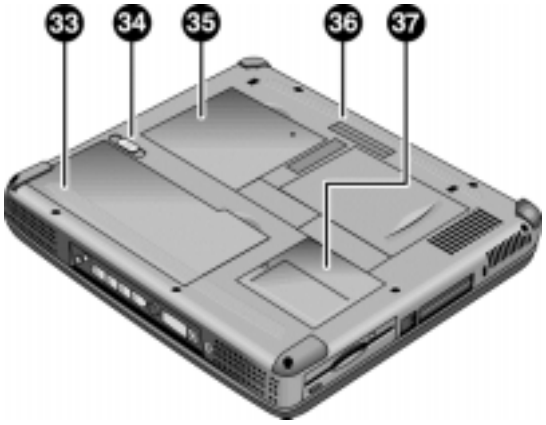

Figure 1-4. Bottom View

33. Battery.
34. Battery latch.
35. SDRAM cover.
36. Port replicator (docking) connector.
37. Mini-PCI card 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 button 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 1-1. 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 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 display, hard drive, and other components. Maintains current session in SDRAM. Restarts quickly. Restores network connections.	Press the blue standby button –or– click Start, Shutdown, Standby –or– allow timeout (Windows 98 only).	Press the blue standby button to display your current session ("Instant-On").
Hibernate mode (Power status LED turns off.) Saves maximum power. Saves current session to disk, then shuts down. Restores network connections.	Press Fn+F12 –or– Click Start, Shut Down, Hibernate (Windows 2000 only) –or– allow timeout (Windows 98 only).	Press the blue standby button to restart and restore your previous session.
Shut down (off) (Power status LED turns off.) Saves maximum power. Turns off without saving current session. At startup, resets everything, starts a new session, and restores network connections with mini-PCI card, and with some PCMCIA cards.	Click Start, Shut Down, Shut down (recommended) –or– slide the power button.	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.

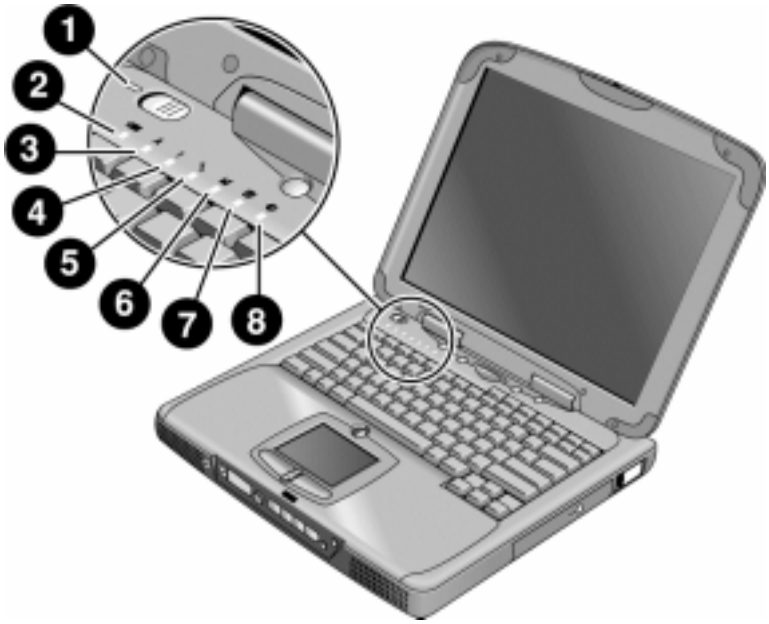

Figure 1-5. Status Lights

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

Table 1-1. Status Lights

Indicator	Meaning
LED next to power button	**Power status** Green: notebook is on. Amber: notebook is in Standby mode. No light: notebook is off or in Hibernate mode.
	**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** Scroll Lock is active.
	**Floppy disk drive activity** Green: notebook is accessing the floppy disk drive.
	**Hard disk drive activity** Green: notebook is accessing the hard disk drive.
	**CD-ROM or DVD drive activity** Green: notebook is accessing the CD-ROM or DVD drive.

In addition, the status panel on the front of the notebook 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.

External keyboards support only Fn+F5, Fn+F7, and Fn+F12. To use these, press and hold left CTRL+left ALT, press the appropriate second key, then release both keys.

Table 1-1. 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+F12	Enters Hibernate mode (Windows 2000 only).
Fn+NumLock	Toggles Scroll Lock on and off (except on external keyboards).
Fn+Up arrow	Increases sound volume (except on external keyboards).
Fn+Down arrow	Decreases sound volume (except on external keyboards).

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: press CTRL+ALT+DEL, then click Shut Down. Press the blue standby button to restart.
- Slide and hold the power button for about four seconds, until the display shuts down, then press the blue standby button to restart.
- Insert a straightened paper clip into the system-off switch on the left side of the notebook (beneath the PC card eject buttons), then press the blue standby button to restart.

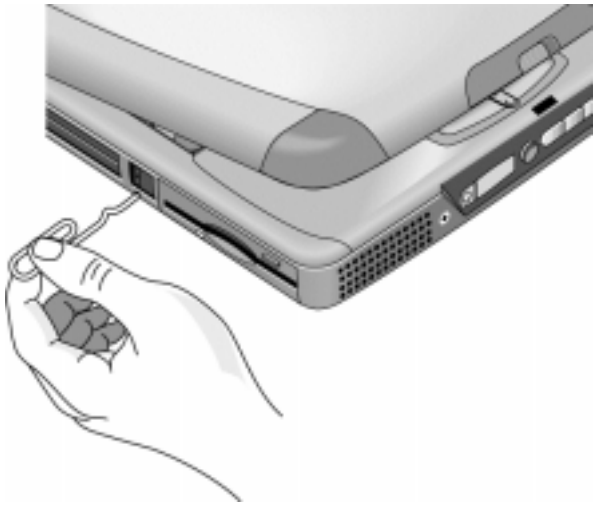

Figure 1-6. Resetting the Notebook

Note

To boot from a CD-ROM or DVD drive in the module bay, insert a bootable CD (such as the *Recovery CD,*) into the drive, then restart. Press ESC twice when the HP logo and prompt appear, then select the CD-ROM/DVD drive as the temporary boot device.

Using the CD-ROM or DVD Player

The multimedia buttons on the front of the notebook control the CD-ROM/DVD player, and work in much the same way as do the controls of a standalone CD-ROM or DVD player. The CD-ROM/DVD 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-ROM/DVD player, see the notebook's *Reference Guide*.

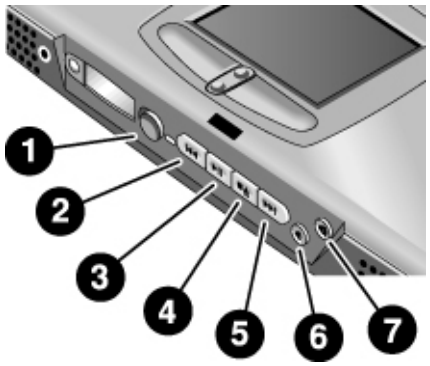

Figure 1-7. Multimedia Buttons

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 1-1. XE3 Series Hardware Specifications

Dimensions	14.1/12.1-in display: 331 × 272.3 × 40.5 mm (13.03 × 10.72 × 1.59 in). 15/13-in display: 331 × 272.3 × 42.0 mm (13.03 × 10.72 × 1.65 in).
Weight	3.0–3.4 kg (6.7–.7.4 lb), depending on configuration.
Processor	Intel Pentium III 500/550/600/650/700/750/800 MHz by µPGA2 with SpeedStep. Intel Celeron 500/550/600/650/700 MHz by µPGA2. 100-MHz FSB.
Display	800 x 600 SVGA TFT 12.1-in LCD. 1024 x 768 XGA TFT 13-in LCD. 1024 x 768 XGA TFT 14.1-in LCD. 1024 x 768 XGA TFT 15-in LCD.
Graphics Controller	S3 Savage/IX: – Integrated 4 MB SGRAM. – Supports AGP 2x mode. – 128-bit, single-cycle 3D architecture. – Simultaneous LCD/CRT and LCD/CRT/TV capability. – Optimized hardware motion compensation. – New high-performance, 128-bit 2D engine. – Integrated single-channel 110-MHz LVDS interface. – Integrated NTSC/PAL encoder.
Chip Set	Intel 440ZXM-100.
SDRAM	100 MHz SDRAM (PC100). No SDRAM on board. Two 1.25-in. slots for expansion up to 256 MB, using two 128-MB SODIMM modules (144 pin, 3.3 V).
Power	**Battery:** rechargeable 9-cell: – Lithium ion: 11.1 V, 5400 mAh, 18650 size. – Nickel metal hydride: 10.8 V, 4000 mAh, 17670 size. – Operating time: up to 3.3 hours typical (varies with configuration and usage). – Recharge time: 2.2 hours. – Standby/resume capability. – Smart pack, SM bus. **AC adapter:** Universal 60-watt, 100-240 Vac (50/60 Hz) input, 19 Vdc output.
Mass Storage	**Hard disk drive:** – 5 or 10 GB, PCI Bus Master Enhanced IDE. – 9.5 mm, 2.5-in. – Supports Ultra DMA/33. **Floppy disk drive:** 1.44-MB, 12.7 mm, 3-mode module. **CD-ROM/DVD drive:** 24x CD-ROM or 4x CD-RW, 12.7 mm module.

Keyboard and Pointing Device	**Keyboard:** – 87-/88-/90-key touch-type QWERTY keyboard with 101/102 key emulation. – Embedded numeric keypad, 12 function (Fn) keys. – Spill-resistant. – NS 87570 keyboard controller. **Pointing device:** touch pad with on/off and scroll up/down buttons.
Audio System	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. Stereo sound via two built-in speakers. Built-in microphone. Microphone and headphone jacks.
CD Player	OZ-163 controller. CD can play while notebook is off.
Communications	**LAN:** – Transmission rate: 10 or 100 Mbps based on Auto-Negotiation. – Data standard: supports Category 3 (10BaseT/100BaseT) and Category 5 (100 Base TX) media coupler. – 10BASE-T/100BASE-TX: 10BASE-T/100BASE-TX MAC+PHY integrated controller solution. – Power management: supports remote power-up using Wake on LAN (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.
Input/Output	Super I/O controller: SMC 869. Serial port: 9-pin (RS232), 115,200-bps (16550 UART). Parallel port: 25-pin, bi-directional, high-speed, with ECP/EPP capability. PS/2 port: 6-pin keyboard/keypad/mouse port (Y adapter compatible). VGA video out: 15-pin, with hot plug/unplug CRT-detect. (Resolution from 640 × 480 up to 1024 × 768, depending on available SDRAM.) Two universal serial bus (USB) ports. One IrDA-compliant fast infrared (FIR) port. Docking port for simple port replicator. DC-in jack. Composite TV out: supports LCD, CRT, LCD/CRT, LCD/TV.
PCMCIA	TI 1420: two slots – PC Card 95 supports one type III or two type II sockets. – Complies with PCI power management, ACPT 2.0, PCI local bus spec. Rev. 2.2. – 3.3-volt core logic with universal PCI interface, compatible with 3.3/5-volt PCA signaling environment. – Supports burst transfers to maximize data throughput on both PCI buses. – Supports parallel PCI interrupts, parallel ISA IRQ with parallel PCI interrupts, serial ISA IRQ with parallel PCI interrupts, and serial ISA IRQ with PCI interrupts. – Can wake up from D3 (cold). – No Zoomed Video support.
Options	32/64/128 MB PC-100 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.

Mechanical Features	Kensington MicroSaver lock slot. Continuously variable-speed fan.
Standards	PC99, ACPI.
Environmental Limits	Operating temperature: 0 to 40 °C (32 to 104 °F). Operating humidity: 10 to 90 percent RH without condensation. Operating altitude: up to 3050 m (10,000 ft). Storage temperature: –20 to 65 °C (–4 to 149 °F). Storage altitude: up to 12,200 m (40,000 ft). Mean time between failure: 20,000 hours.

Software Specifications

Table 1-1. XE3 Series Software Specifications

Operating Software	Microsoft Windows 98SE, 2000, or Millennium Edition (all in ACPI mode). 512KB flash BIOS ROM (PLCC type with socket for B-Test only). Supports standby to RAM or hard disk. Hot keys for system control. Password protection. Auto-configuration when using simple port replicator. PC99 ready with Plug-and-Play. Keyboard BIOS flashable. ACPI 1.0b compatible. Smart battery support. DMI EEPROM (2 KB) extension. Bootable devices; FDD, HDD, CD-ROM/DVD.
Applications	Adobe Acrobat Reader. MusicMatch MP3 software (certain models only). DVD player (models with DVD only). One-Touch Button software. Fax software (included in Windows 2000). Virus protection software. For additional information about the notebook's software, see the HP Notes.

System Resources

The following tables list the default values for the notebook's system resources. Use the BIOS Setup utility (see page 3-29) to view all available port and audio device configurations in the System Devices menu.

The tables in this section show typical resource usage as set up by the notebook's BIOS. Plug-and-play operating systems, drivers, and BIOS Setup settings may change some of the entries.

Table 1-1. System Interrupts

0	System timer
1	Keyboard
2	Cascade from secondary interrupt controller
3	Free
4	COM1 (serial port)
5	Audio
6	Floppy disk drive
7	LPT1 (ECP parallel port)
8	Real-time clock
9	SCI
10	PCI IRQ (shared by all PCI devices)
11	Free (or MIDI if enabled)
12	Touch pad, PS/2 mouse
13	Numeric coprocessor
14	Internal hard disk drive (primary IDE controller)
15	Internal CD-ROM drive (secondary IDE controller)

Table 1-2. System Memory

00000–9FFFF	System memory
A0000–BFFFF	Video
C0000–CFFFF	Video BIOS
D0000–DBFFF	Free: can be used for upper memory blocks (UMBs) or PC card memory windows
DC000–FFFF	System BIOS

Table 1-3. System Input/Output Addresses (100-3FF)

170–177	Internal CD-ROM drive (secondary IDE controller)
1F0–1F7	Internal hard disk drive (primary IDE controller)
220–22F	DOS games (FM decoding)
376	Internal CD-ROM drive (secondary IDE controller)
378–37F	LPT1 (printer port)
388–38B	DOS games (FM decoding)
3B0–3BB	VGA adapter
3C0–3DF	VGA adapter
3E0–3E1	PCMCIA controller
3F0–3F5	Floppy disk drive controller
3F6	Internal hard disk drive (primary IDE controller)
3F7	Floppy disk drive controller
3F8–3FF	COM1 (serial port)

Table 1-4. DMA Channels

0	Free
1	Free
2	Floppy disk drive
3	LPT1 (ECP parallel port)
4	Cascade from secondary DMA controller
5	Free
6	Free
7	Free

Table 1-5. XE3 Series Accessories

Accessory	Description
Memory	
F1456B	32-MB SDRAM PC-100 expansion module
F1457B	64-MB SDRAM PC-100 expansion module
F1622B	128-MB SDRAM PC-100 expansion module
Power Options	
F1454A	AC adapter (60-watt)
F1781A	Ultra Slimline AC adapter (60-watt)
F1455A	Auto/airline AC adapter (75-watt)
F2024A	LiIon battery (9 cell)
Adapters	
F1469A	PS/2 “Y” adapter
PC Cards	
F1623A	10/100-Mbps Ethernet +56-Kbps modem PC Card by Xircom
F1625A	56-Kbps global modem PC Card by Xircom
F1626A	10/100 LAN CardBus PC Card by 3Com
F1626B	10/100 LAN CardBus PC Card by 3Com
F1627A	56-Kbps US modem PC Card by Xircom
F1643A	RealPort 10/100-Mbps Ethernet + 56-Kbps modem PC Card by Xircom
F1985A	USB-NIC Ethernet adapter by 3Com
Docks	
F2025A	Simple port replicator
Wireless Accessories	
F2135A	Wireless LAN access point
F2136A	Wireless LAN PC Card
F2137A	Wireless LAN PCI adapter
F2138A	Wireless card
Security Accessories	
F1645A	Kensington MicroSaver Notebook Security System
F1747A	Port Defcon 1 Notebook Security System
F1611C	Mobile ProtectTools 2000 Smart Card Kit (128-bit version for U.S. and Canada only)
F1612C	Mobile ProtectTools 2000 Smart Card Kit (40-bit version for outside U.S. and Canada)

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 1-18 lists the roles that the replaceable modules play in each of the notebook's functional subsystems.

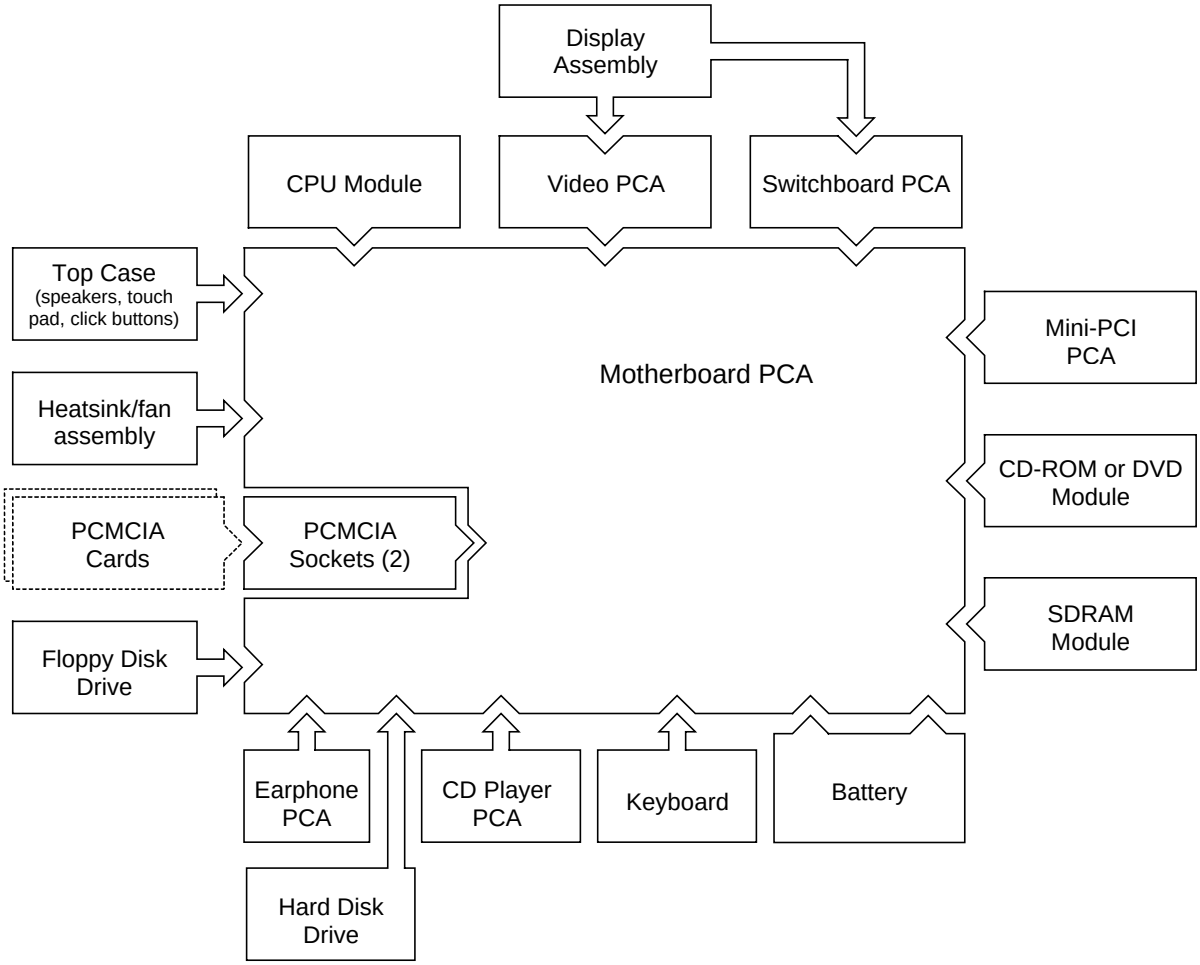

Figure 1-8. Replaceable Module Diagram

Table 1-1. 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 PCA	No onboard RAM. Changeable RAM (2 slots). Video RAM.
Power	Battery Motherboard Switchboard PCA AC adapter	Power storage. Power control circuitry, AC adapter socket, lid switch, system-off switch, power supply. Power button, standby button. AC-to-DC converter.
Display	Motherboard Display assembly Video PCA	Video controller. Display output, backlight, power converter for backlight. Display drivers, LVDS processing, display/graphics controller, video RAM.
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-ROM/DVD status display.
Serial	Motherboard	I/O controller, serial connector.
Parallel	Motherboard	I/O controller, parallel connector.
Infrared	Motherboard	I/O controller, infrared transmitter/receiver.
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

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 M2.5×5mm T-head screw.)

Disassembly Flowchart

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

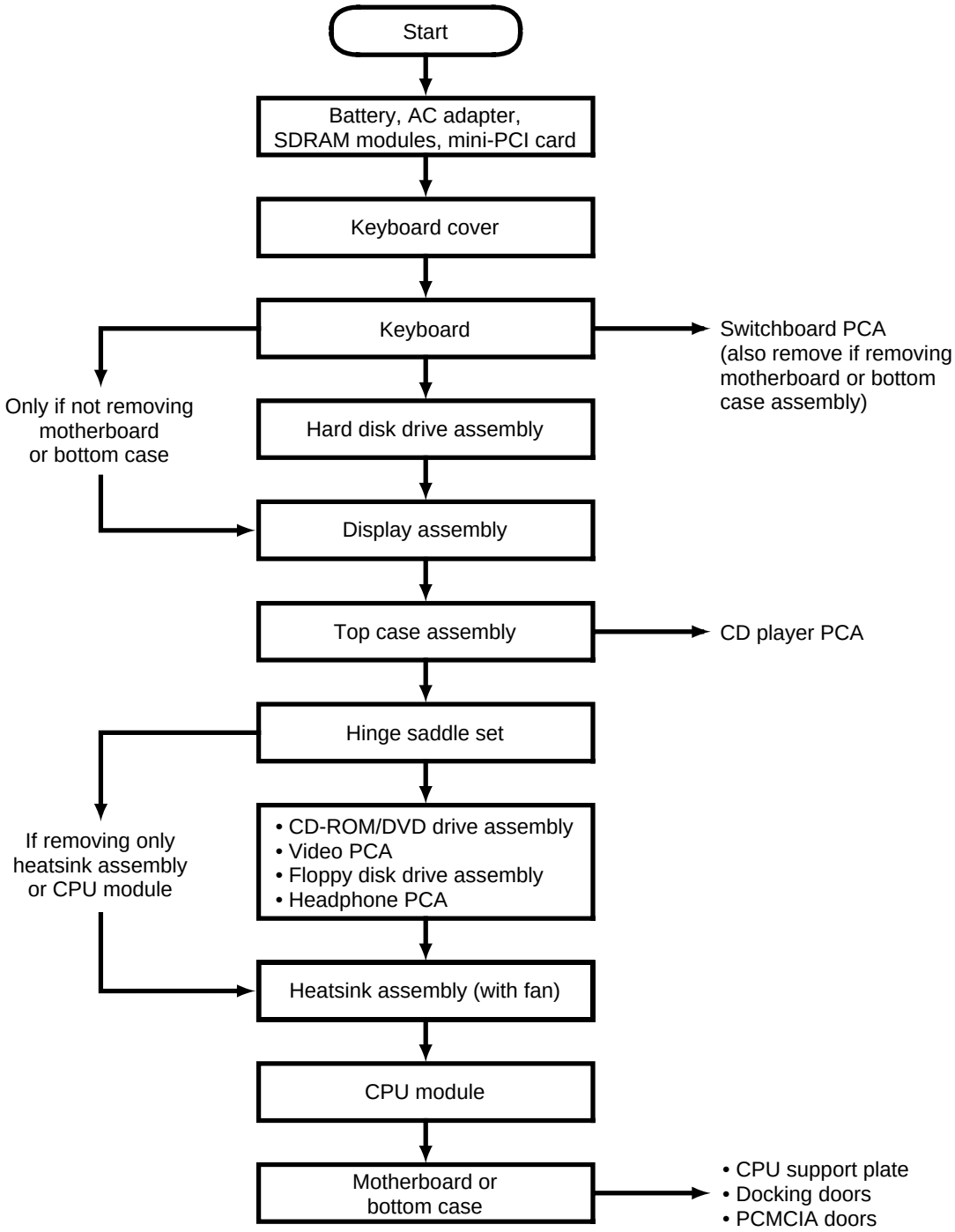

Figure 2-1. Disassembly Flow