HP Omnibook XE4400

Technology Code KD

Service Manual

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Introduction

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

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

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

Source	Address or Number	Comments
HP Notebook Web Site	http://www.hp.com/notebooks (http://www.europe.hp.com/notebook, European mirror)	
HP Business Support web Site	www.hp.com/go/bizsupport	
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 HP Omnibook XE4400 notebook computer provides outstanding performance and expandability in a conveniently portable form. The notebook's high-performance components use the latest technologies to enable it to serve as a desktop computer or a portable multimedia presentation tool. Note that the following list of products is current at the time of publication but is subject to change.

Table 1-1. Omnibook XE4400 Notebook

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

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

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

Features

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

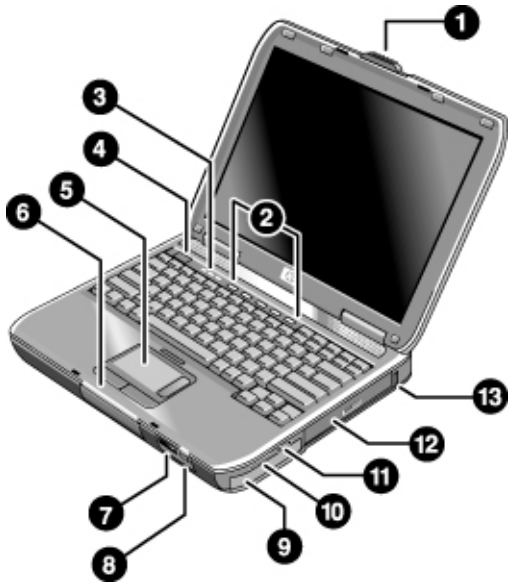

Figure 1-1. Omnibook XE4400— Front View

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

* on certain models

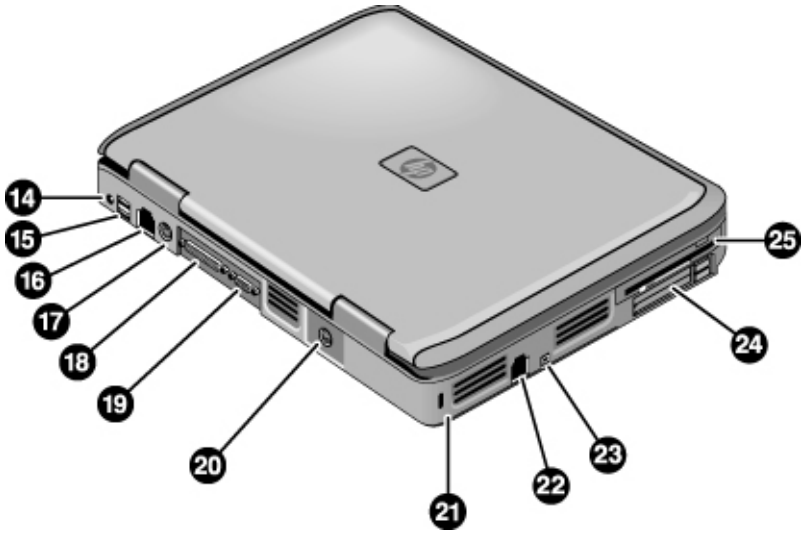

Figure 1-2. Omnibook XE4400— Back View

14. AC adapter jack.
15. Two USB ports.
16. LAN port*.
17. PS/2 keyboard or PS/2 mouse port (supports Y adapter).
18. Parallel port (LPT1). Use this port for a parallel printer or other parallel device.
19. External monitor.
20. S-video port*.
21. Kensington lock slot (security connector).
22. Modem port*.
23. IEEE 1394 port*.
24. Two PC Card and CardBus slots and buttons.
25. Floppy drive*.

* on certain models

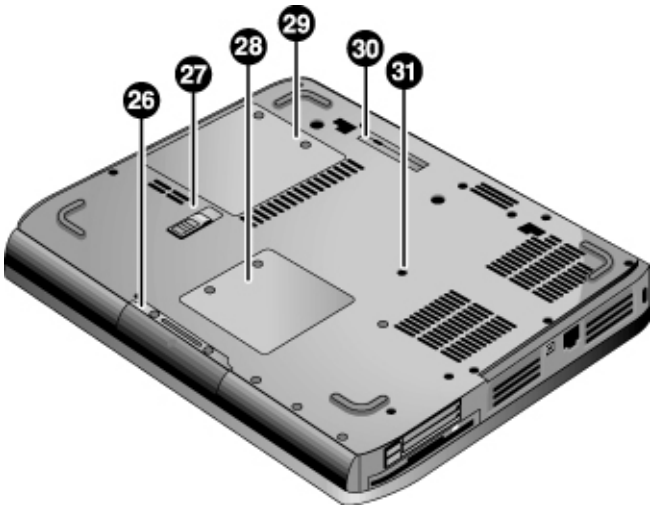

Figure 1-3. Omnibook XE4400— Bottom View

26. Hard disk drive.
27. Battery latch.
28. Mini-PCI door (no user parts inside).
29. SDRAM door.
30. Port replicator connector*.
31. Reset button.

* on certain models

Operation

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

Turning the Notebook On and Off

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

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

Table 1-2. Activating Power Modes

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

Checking the Status of the Notebook

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

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

	Meaning
	**Power status** On: notebook is on (even if the display is off). Blinking: notebook is in Standby mode. Off: notebook is off or in Hibernate mode.
	**Hard disk drive activity** On: notebook is accessing the hard disk drive.
	**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. Blinking: The AC adapter is connected and the battery is missing or has a fault. Off: The AC adapter is not connected.

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

Table 1-4. Keyboard Status Lights

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

Using Fn Hot Keys

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

Table 1-5. Fn Hot Keys

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+F8	Toggles the built-in keypad on and off. Does not affect an external keyboard. If Num Lock is on, then the numeric functions are active; otherwise, cursor control is active (as marked on an external keyboard).
Fn+F12	Enters Hibernate mode.
Fn+NumLock	Toggles Scroll Lock on and off.
Fn+Page Up	Increases the audio volume and cancels the mute setting.
Fn+Page Down	Decreases the audio volume.
Fn+Backspace	Audio mute.

Resetting the Notebook

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

- If possible, shut down Windows:

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

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

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

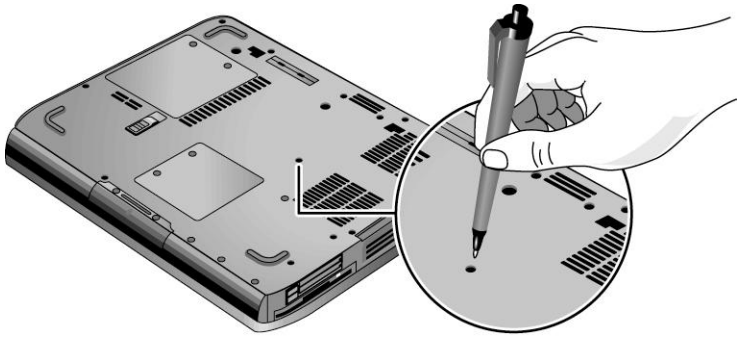

Figure 1-4. Resetting the Notebook

Note

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

Specifications

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

Table 1-6. Omnibook XE4400 Specifications

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

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

Table 1-7. Omnibook XE4400 Accessories

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

Internal Design

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

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

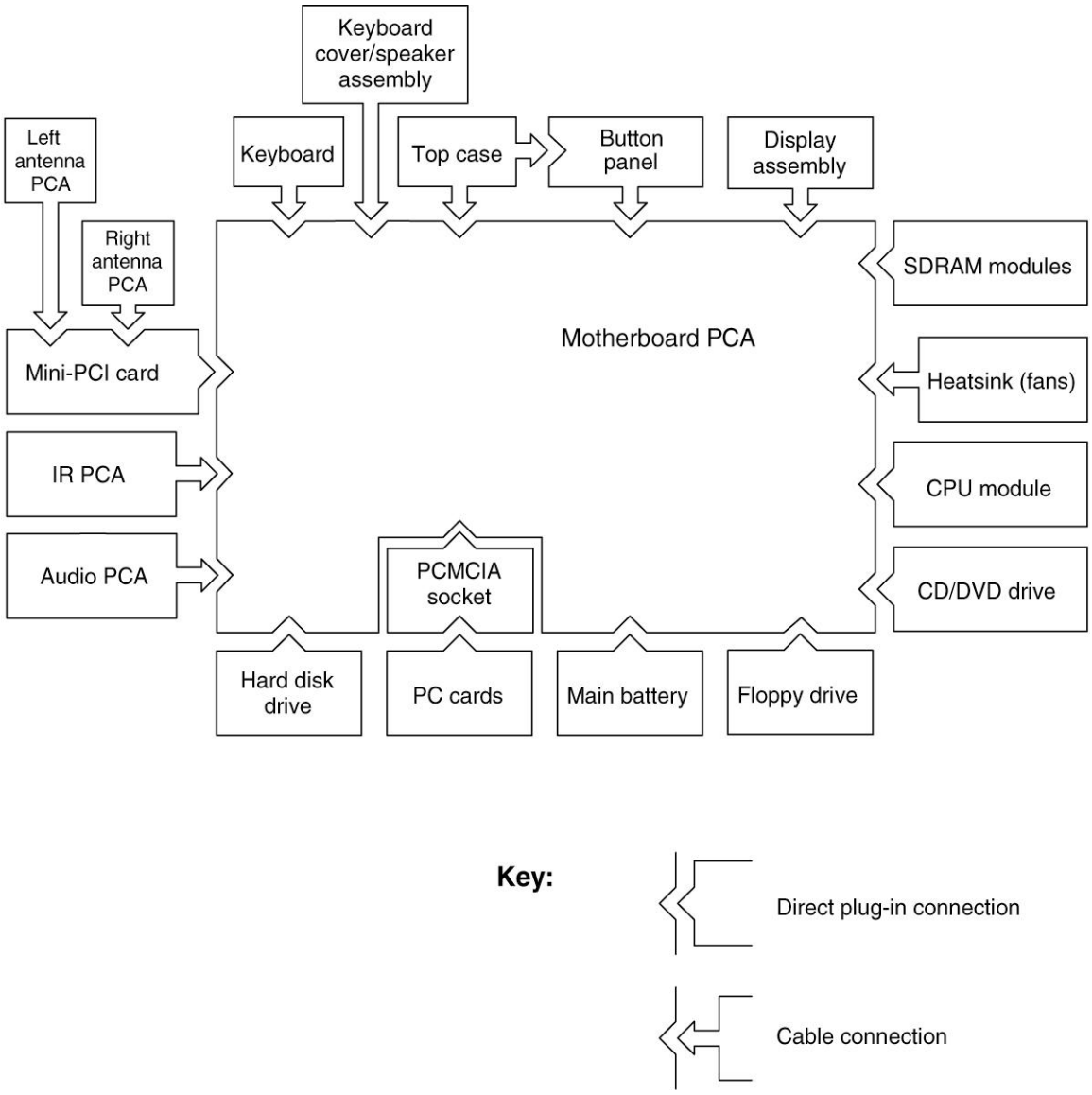

Figure 1-5. Replaceable Module Diagram

Table 1-8. Functional Structure Description

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

2

Removal and Replacement

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

Table 2-1. Removal Cross-Reference

Assembly, display (page 2-18).
Battery, CMOS (page 2-41).
- Battery, main (page 2-4).
- Card, wireless LAN mini-PCI (page 2-7).
Case, bottom (page 2-34).
Case, top (page 2-20).
- Cover, keyboard/speaker assembly (page 2-11).
- Door, mini-PCI (page 2-10).
- Door, memory (page 2-10).
Doors, PCMCIA (page 2-37).
- Drive, hard disk (page2-8).
- Drive, CD/DVD (page 2-17).
Drive, floppy (page 2-18).
- Feet, rubber (page 2-10).
Heatsink (with fans) (page 2-31).
Keyboard (page 2-13).
Module, CPU (page 2-33).
- Module, SDRAM (page 2-5).
- Panel, cover (page 2-15).
PCA, audio control (page 2-26).
PCA, front antennas (page 2-37).
PCA, IR (page 2-24).
PCA, motherboard (page 2-34).
- Rubber screw plug, HDD (page 2-10).
Shield, ESD (page 2-29).
Socket, PCMCIA (page 2-28).

Caution

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

Notes

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

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

Table 2-2. Required Equipment

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

Table 2-3. Recommended Screw Torque Values

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

Disassembly Flowchart

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

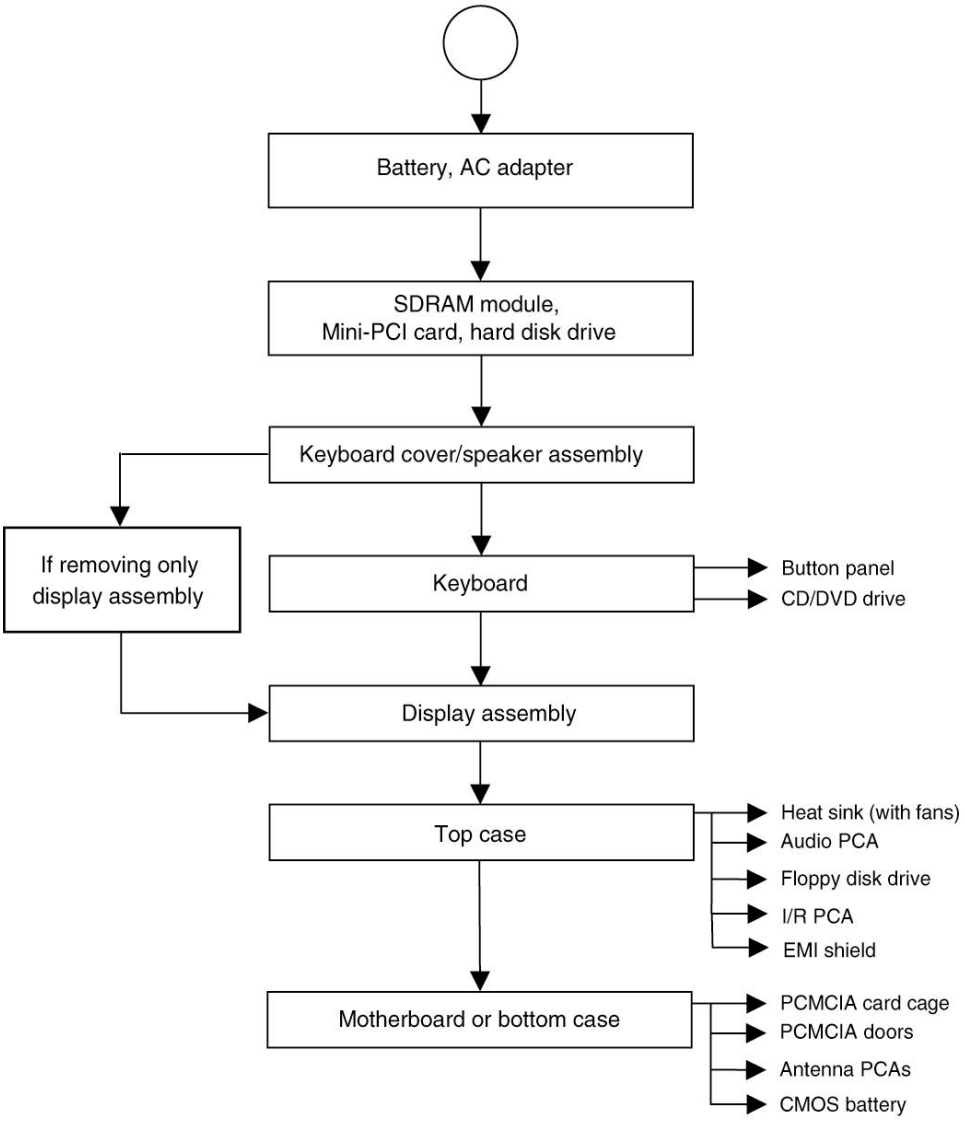

Figure 2-1. Disassembly Flow

Removing the Battery
(User-Replaceable)

Required Equipment

- None.

Removal Procedure

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

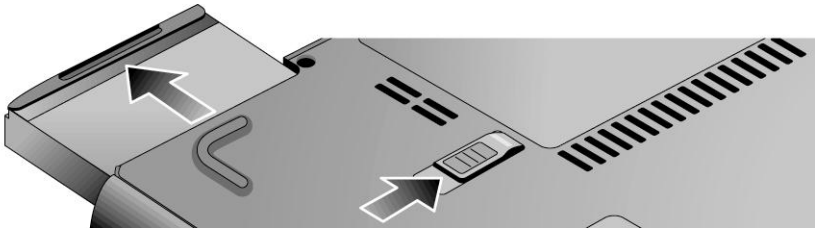

Figure 2-2. Removing the Battery

Removing a SDRAM Module
(User-Replaceable)

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

Note

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

Caution

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

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

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

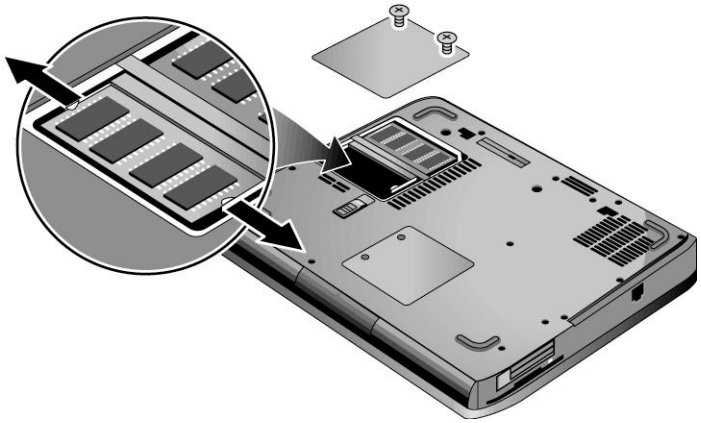

Figure 2-3. Removing an SDRAM Module

Reassembly Notes

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

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

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

Caution

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

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

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

Caution

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

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

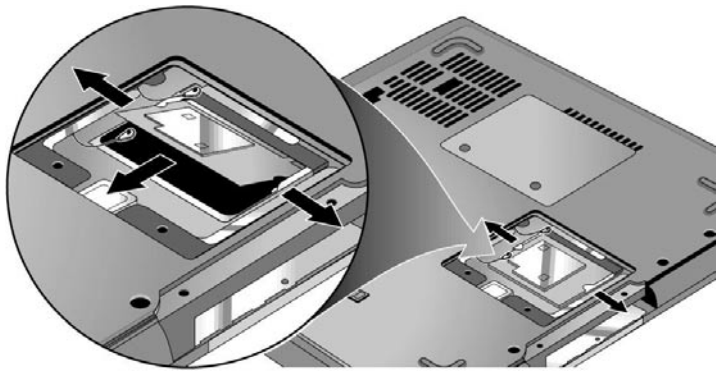

Figure 2-4. Removing the Mini-PCI Card

Reassembly Notes

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

Removing the Hard Disk Drive
(User-Replaceable)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

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

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

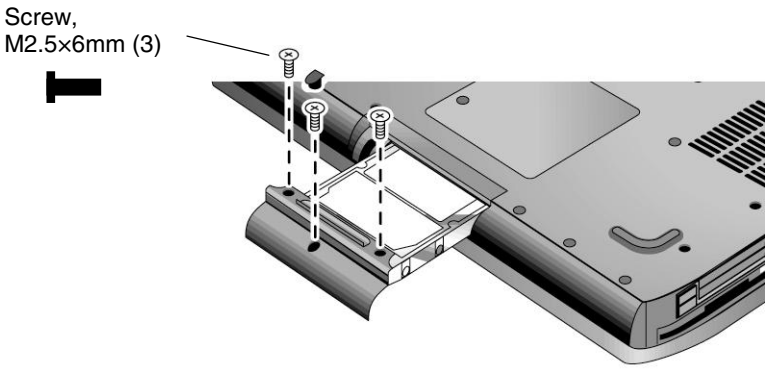

Figure 2-5. Removing the Hard Disk Drive