
HP OmniBook 6000



Service Manual

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Introduction

This manual provides reference information for servicing the HP OmniBook 6000. 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 OmniBook 6000 computers. The manual is self-contained, so that you can follow it without having equipment available.

The following table lists other sources of information about the computers 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.
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 Bulletin Board Service		Refer to the latest Product Support Plan for non-US BBS numbers.
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.

Product Information

The HP OmniBook 6000 provides outstanding performance and expandability, in a conveniently portable form. Its high-performance components use the latest technologies to enable it to replace a desktop computer or serve as a portable multimedia presentation tool.

Table 1-1. OmniBook 6000 Series Models

OmniBook Product *	CPU **	Display	Hard Drive	Drives	Standard SDRAM	Mini-PCI Card
F2072x	Celeron 550 MHz	14.1" XGA	5 GB	CD-ROM, FDD	64 MB	SW Modem
F2073x	Celeron 550 MHz	14.1" XGA	5 GB	CD-ROM, FDD	64 MB	None
F2079x	Pentium III 600/500 MHz	14.1" XGA	6 GB	CD-ROM, FDD	128 MB	Modem/LAN
F2080x	Pentium III 600/500 MHz	14.1" XGA	6 GB	CD-ROM, FDD	128 MB	None
F2081x	Pentium III 600/500 MHz	14.1" XGA	6 GB	CD-ROM, FDD	64 MB	Modem/LAN
F2082x	Pentium III 600/500 MHz	14.1" XGA	6 GB	CD-ROM, FDD	64 MB	None
F2083x	Pentium III 650/500 MHz	14.1" XGA	10 GB	CD-ROM, FDD	128 MB	Modem/LAN
F2084x	Pentium III 650/500 MHz	14.1" XGA	10 GB	CD-ROM, FDD	128 MB	None
F2087x	Pentium III 700/600 MHz	14.1" XGA	12 GB	DVD, FDD	128 MB	Modem/LAN
F2088x	Pentium III 700/600 MHz	14.1" XGA	12 GB	DVD, FDD	128 MB	None
F2090x	Pentium III 700/600 MHz	15.0" XGA	18 GB	DVD, FDD	128 MB	Modem/LAN
F2091x	Pentium III 700/600 MHz	15.0" XGA	18 GB	DVD, FDD	128 MB	None

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

* For the products listed:

"x" suffix means

"W", "WT", "WG", or "WU" for Windows 95 or Windows 98 installed, or

"K", "KT", "KG", or "KU" for Windows 2000 installed (marketing distinction only).

** Intel Mobile Pentium III with SpeedStep Technology or Intel Mobile Celeron processor.

Table 1-2. Product Comparisons

	OmniBook 6000	OmniBook 4150B	OmniBook 900B
Processor*	Celeron (550 MHz) or Pentium III (600/500, 650/500, or 700/600 MHz).	Celeron (450 MHz), Pentium II (366 to 500 MHz), or Pentium III (650/500 MHz).	Pentium III (450, 500, 600/500, or 650/500 MHz).
Memory	64 or 128 MB SDRAM in system slot. Expandable to 512 MB.	64 MB SDRAM. Expandable to 256 or 512 MB.	64 MB SDRAM on motherboard. Expandable to 160 or 320 MB.
Display	15.0- or 14.1-inch TFT XGA display.	14.1- or 13.3-inch TFT XGA display.	13.3-inch TFT XGA or 12.1-inch TFT SVGA display.
Video	AGP graphics interface. 4 or 8 MB video RAM with 32- or 64-bit graphics interface and 64-bit graphics controller. 3D and OpenGL graphics support. Up to 16M colors (XGA). Zoomed Video enabled.	AGP graphics interface. 4 or 8 MB video RAM with 32- or 64-bit graphics interface and 64-bit graphics controller. 3D and OpenGL graphics support. Up to 16M colors (XGA). Zoomed Video enabled.	AGP graphics interface. 4 MB video RAM with 32-bit graphics interface and 64-bit graphics controller. 3D and OpenGL graphics support. Up to 16M colors (XGA). Zoomed Video enabled.
Operating System	Windows 95, Windows 98, or Windows 2000 preinstalled.	Windows 95, Windows 98, Windows NT, or Windows 2000 preinstalled.	Windows 95, Windows 98, Windows NT, or Windows 2000 preinstalled.
Desktop Management Interface	DMI 2.3. HP TopTools 4.5.	DMI 2.0. HP TopTools 2.6 to 4.5.	DMI 2.0. HP TopTools 3.0 to 4.5.
Power Management	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.
Power States	On, Display-off, Standby, Hibernate, Off.	On, Display-off, Standby, Hibernate, Off.	On, Display-off, Standby, Hibernate, Off.
* Intel Mobile Pentium or Mobile Celeron Processor. Dual-speed processors use Intel SpeedStep Technology.			

Features

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

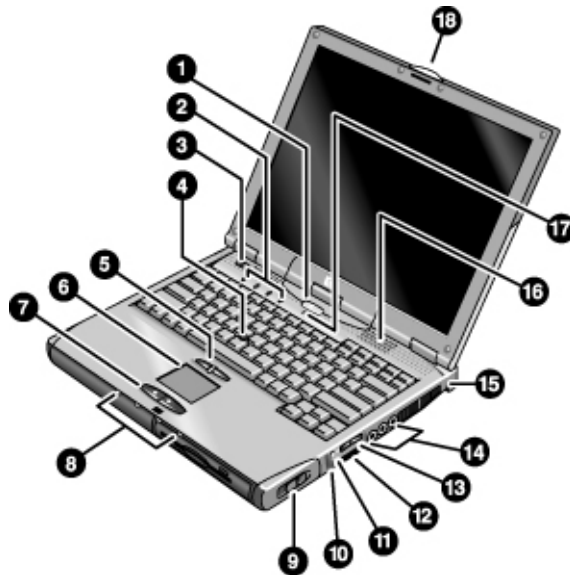


Figure 1-1. OmniBook — Front View

- | | |
|--|---|
| 1. Sleep button. Suspends and resumes operation. | 10. System-off switch. |
| 2. Keyboard status lights (left to right: Caps Lock, Num Lock, Keypad Lock, Scroll Lock). | 11. Audio-off button and audio-off light. |
| 3. Power slide button. Turns the computer on and off. | 12. Infrared port (below the volume control). |
| 4. Pointing stick (pointing device). | 13. Volume control. |
| 5. Click buttons and scroll button. | 14. Audio jacks (left to right): audio out (headphones), external microphone, audio in. |
| 6. Touch pad (pointing device). | 15. Kensington lock slot (security connector). |
| 7. Click buttons. | 16. Built-in speakers (one on each side). |
| 8. Main status lights (left to right): power state, hard disk activity, charging status for main battery, and charging status for secondary battery. | 17. Built-in microphone. |
| 9. Module eject latch. | 18. Latch for opening the computer. |

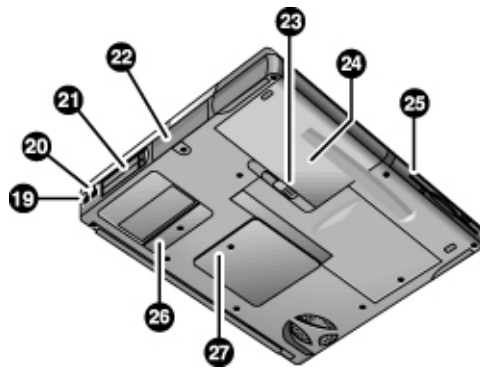


Figure 1-2. OmniBook — Lower View

- | | |
|---|---|
| 19. Modem port (on certain models). | 24. Main battery. |
| 20. LAN port (on certain models). | 25. Plug-in module bay. Can contain a CD-ROM or DVD drive, floppy disk drive, secondary battery, or other plug-in module. |
| 21. PC Card and CardBus (PCMCIA) slots (upper and lower). | 26. Mini-PCI cover (no user parts inside). |
| 22. Hard disk drive. | 27. SDRAM cover. |
| 23. Main battery latch. | |

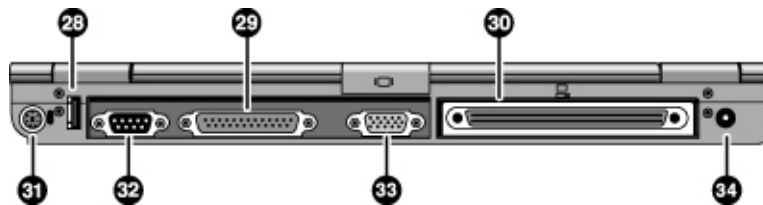


Figure 1-3. OmniBook — Rear View

- | | |
|--|---|
| 28. Universal serial bus port (USB). | 32. Serial port (COM1). Use this port for a serial mouse, modem, printer, or other serial device. |
| 29. Parallel port (LPT1). Use this port for a parallel printer or other parallel device, or to connect the floppy disk drive externally. | 33. External monitor port. |
| 30. Docking port. | 34. ac adapter jack. |
| 31. PS/2 keyboard or PS/2 mouse port (supports Y adapter). | |

Operation

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

Turning the OmniBook On and Off

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

Table 1-3. Activating Power Modes

Power mode	To enter this mode	To turn on again
Display-off mode 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 Saves significant power. Turns off the display and other components. Maintains current session in SDRAM. Restarts quickly. Restores network connections.	Press blue sleep button —or— click Start, Suspend (Windows 95) or Start, Shutdown, Standby (Windows 98 and 2000) —or— allow timeout.	Press the blue sleep button to display your current session ("Instant-On").
Hibernate mode 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) —or— allow timeout.	Press the blue sleep button to restart and restore your previous session.
Shut down (off) Saves maximum power. Turns off without saving current session. At startup, resets everything, starts a new session, and restores network connections.	Click Start, Shut Down (recommended) —or— slide the power button.	Press the blue sleep button to restart with a new session.

Checking the Status of the OmniBook

The computer's main status lights, located on the front of the computer, report power status, battery status, and drive activity

Table 1-4. Main Status Lights (front of computer)

   	Meaning
   	Power status Green: computer is on or in Display-off mode (Windows 98 and 2000). Amber: computer is in Standby mode or Display-off mode (Windows 95). No light: computer is off or in Hibernate mode. Red light: computer failed when resuming, and must be reset.
   	Hard disk drive activity Green: computer is accessing the hard disk drive.
   	Main 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 is missing or has a fault. Off: The ac adapter is not connected.
   	Secondary 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 battery has a fault. Off: The ac adapter is not connected, a secondary battery is not installed, or the battery is not charging.

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

Table 1-5. 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.
   	Scroll Lock Scroll Lock is active.

In addition, the battery module has five lights on its back (flat) side that indicate its charge level. To see these lights, you must remove the battery and press the pad next to the lights. The number of lights that turn on indicates the charge.

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 1-6. 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 computer's speakers.
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.
Fn+F12	Enters Hibernation mode.
Fn+NumLock	Toggles Scroll Lock on and off.
Fn+UP ARROW	Increases sound volume.
Fn+DOWN ARROW	Decreases sound volume.

Resetting the OmniBook

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

1. If possible, shut down Windows: press CTRL+ALT+DEL, then click Shut Down. Press the blue sleep button to restart.
2. Slide and hold the power button for 4 seconds, until the display shuts down, then press the blue sleep button to restart.

—or, if this fails—

Insert a straightened paper clip into the system-off switch on the right side of the computer, then press the blue sleep button to restart.

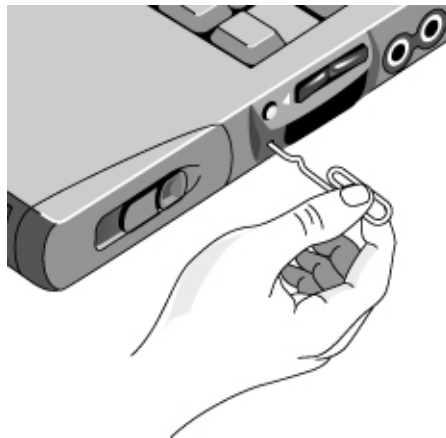


Figure 1-4. Resetting the Computer

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 reboot. Press ESC twice during reboot when the HP logo and prompt appear, then select the CD-ROM/DVD drive as the temporary boot device.

Specifications

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

Table 1-7. OmniBook 6000 Series Specifications

Physical Attributes	Size (14.0-inch display): 316 × 261 × 33 mm (12.4 × 10.3 × 1.3 in). Size (15.1-inch display): 325 × 261 × 35 mm (12.8 × 10.3 × 1.4 in). Weight: 2.3–2.9 kg (5.0–6.4 lb), depending on configuration. Magnesium display cover.
Processor and Bus Architecture	550-MHz Celeron processor with 128-KB four-way set-associative L2 cache. –or– 600-, 650-, or 700-MHz Intel Mobile Pentium III processor with SpeedStep technology with 256-KB four-way set-associative L2 cache. 1.6-V core, 2.5-V external, low-power processor. 32-KB (16-KB instruction, 16-KB data) L1 cache. 32-bit PCI bus.
Graphics	14.1- or 15.0-inch XGA active-matrix (TFT) display (1024 × 768 × 16M colors). Zoomed Video support for lower PC Card slot. 3D and OpenGL graphics support. Celeron models: ATI Mobility M graphics accelerator with 4-MB display RAM, 2x AGP graphics capability. Pentium III models: ATI Mobility M1 graphics accelerator with 8-MB display RAM, 2x AGP graphics capability.
Power	Rechargeable lithium-ion battery with LED charge-level gauge (11.1 or 14.8 Vdc). Battery life (one battery): up to 4 hours typical with 8-cell Li-Ion 14.8-V battery (varies with model and usage). Fast battery recharge: 80% in 1.5 hour, 100% in 2 hours. Low-battery warning. Suspend/resume capability. Universal 60-watt ac adapter: 100–240 Vac (50/60 Hz) input, 19 Vdc output. Optional secondary battery available for module bay.
Mass Storage	18-, 12-, 10-, 6-, or 5-GB removable hard drive. 1.44-MB floppy drive module. 24x CD-ROM or 6x DVD drive module (or higher). Optional drive modules available.
SDRAM	Two slots for expansion up to 512 MB. 64 or 128 MB SDRAM installed in one slot. 100-MHz RAM bus.
Audio System	16-bit Sound Blaster Pro-compatible stereo sound. Stereo sound via two built-in speakers (500 Hz to 10 KHz range). 3D-enhanced PCI bus audio with Zoomed Video support. Built-in microphone. Separate audio-off button with indicator light. Headphone-out, microphone-in, and audio line-in.
Keyboard and Pointing Device	87-key touch-type QWERTY keyboard with 101/102 key emulation. Embedded numeric keypad. 12 function (Fn) keys. Two pointing devices: pointing stick (TrackPoint technology licensed from IBM) and touch pad.

Communications	LAN/Modem Models (3Com): LAN - Ethernet 10Base-T (10 Mbps) and 100Base-TX (100 Mbps) support. - Supports wake-on-LAN, remote wake-up (Windows 98), fast IP, DMI, dRMON. - MBA (Managed Boot Agent) support for PXE/BINL, BOOTP, NCP/IPX, DHCP. Modem - Data speed: 56 Kbps (V.90) 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, 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 channel 2. Modem-Only Models (Ambit): Data speed: 56 Kbps (V.90) 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, 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.
Input/Output	Universal serial bus (USB). 9-pin, 115,200-bps serial (16550 UART). 25-pin bi-directional ECP/EPP parallel. 15-pin VGA video-out with DDC support. (Resolution up to 1600 × 1200 × 64K or 16M colors. Refresh rate up to 60 to 100 Hz, depending on resolution.) Dual display. PS/2 keyboard/mouse. 4-Mbps IrDA-compliant infrared port.
Expandability	One Type III or two Type II 16-/32-bit PC Card slots (3.3- and 5-V support). CardBus enabled. Plug-in module bay for accessory modules. Optional port replicator, mini dock, and docking system.
Software	Microsoft Windows 95, 98, or 2000. Windows 95/98/2000-compatible Plug-and-Play. Advanced Power Management (APM) (Windows 95 and 98 only). DMI with HP TopTools. HP e-center (North America English only). Adobe Acrobat Reader. Agaté Tioman for HP (Hot Swap) (Windows 95 and 98 only). QuickLink (Windows 98 only). DiagTools. VirusScan. Online <i>Reference Guide</i>. <i>Recovery CD</i> included. Centralized worldwide BIOS and driver update service.

Security Features	User and administrator passwords. System, hard drive, and docking passwords. PC identification displayed at boot. DMI-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). Storage temperature: –20 to 50 °C (–4 to 122 °F).
Major ICs	CPU: Intel Mobile Pentium III or Celeron processor. South Bridge: PIIX4M. Display controller: ATI Mobility M or M1. Audio controller: ESS Maestro-3E and ESS ES1921. CardBus controller: TI PCI 1420. Keyboard/embedded controller: National PC87570. BIOS flash: SST28SF040. Super I/O: National NS97338.

Table 1-8. OmniBook 6000 Series Accessories

Accessory	Description	OmniBook 6000	Compat. 900B	Compat. 4150B
Memory				
F1456B	32-MB SDRAM (100 MHz) expansion module	•	•	•
F1457B	64-MB SDRAM (100 MHz) expansion module	•	•	•
F1622B	128-MB SDRAM (100 MHz) expansion module	•	•	•
F1654A	256-MB SDRAM (100 MHz) expansion module	•	•	•
Hard Drives				
F2016A	18-GB internal hard disk drive	•		
Modules				
F2008A	Floppy disk drive cable (external)	•		
F2009A	Zip drive	•		
F2013A	Floppy disk drive module	•		
F2015A	DVD drive module	•		
F2017A	CD-ROM drive module	•		
F2018A	18-GB second hard drive module	•		
F2022A	LS-120 SuperDisk drive module	•		
F2026A	CD read/write drive module	•		
Power Options				
F1454A	60-watt ac adapter	•	•	•
F1455A	75-watt auto/airline power adapter	•	•	•
F2011A	Battery charger (external)	•		
F2014A	Lithium-ion secondary battery	•		
F2019A	Lithium-ion primary 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)			
8120-6317	Replacement power cord (India, South Africa)			
8120-8367	Replacement power cord (Argentina)			
8120-8373	Replacement power cord (People's Rep. of China)			
8120-8452	Replacement power cord (Chile)			
8120-8699	Replacement power cord (Hong Kong, Singapore, U.K.)			
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-Mbps Ethernet 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	•	•	•
Docks				
F1451A	Port replicator	•	•	•
F1452A	Mini dock	•	•	•
F1453A	Monitor stand (short) for F1451A and F1452A	•	•	•
F1477A	Docking system and monitor stand (tall)	•	•	•
F2012A	Docking tray	•		
F2021A	Docking module bay adapter	•		

Internal Design

The motherboard PCA is the central component of the OmniBook'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 OmniBook's replaceable electronic modules. In addition, the table on page 1-14 lists the roles that the replaceable modules play in each of the OmniBook's functional subsystems.

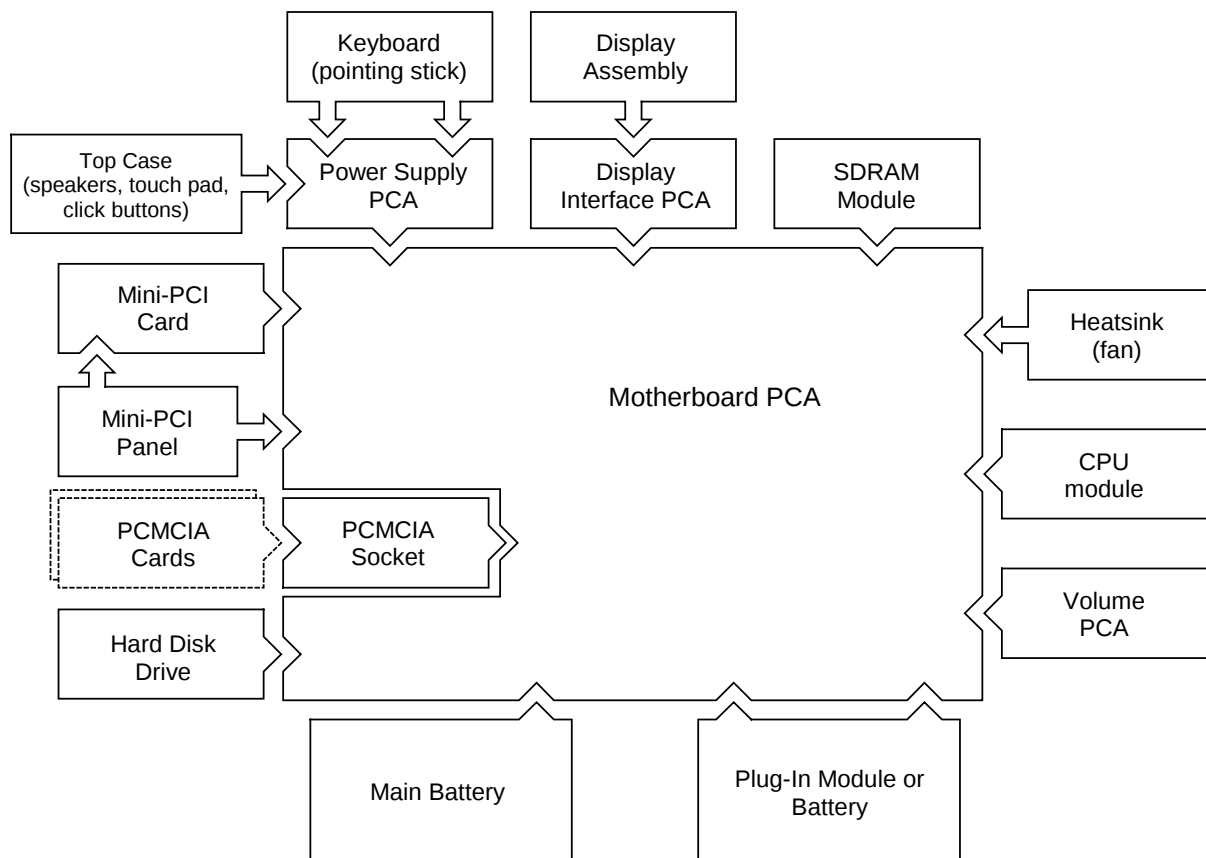


Figure 1-5. Replaceable Module Diagram

Table 1-9. Functional Structure

Bootup	CPU module Motherboard Floppy disk module Hard disk drive	Main processor (MMO). 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 Display interface PCA	No onboard RAM. Changeable RAM (2 slots). Video RAM.
Power	Battery Motherboard Power supply PCA ac adapter	Power storage. ac adapter socket, power switch, lid switch, system-off switch, power supply. Power control circuitry. ac-to-dc converter.
Display	Motherboard Display assembly Display interface PCA	PCMCIA/zoomed 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 Power supply PCA Keyboard	Keyboard BIOS. Keyboard controller Key switches.
Pointer	Motherboard Power supply PCA Keyboard Top case	Keyboard BIOS, pointing stick controller (PS/2 output). Keyboard controller. Pointing stick sensor. Touch pad sensor, click buttons, controller (PS/2 output).
Audio	Motherboard Display interface PCA Volume PCA Top case	Audio controller, audio decoder, speaker amplifier, zoomed video controller. Microphone. External audio jacks, headphone amplifier, audio-off switch. Speakers.
Status	Motherboard Power supply PCA. Display interface PCA 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	Keyboard controller (part of power supply PCA), PS/2 connector.
USB	Motherboard	Bus controller (South Bridge), USB connector.
Docking port	Motherboard	Docking logic, docking connector.
PCMCIA	Motherboard PCMCIA socket	PCMCIA controller. PCMCIA connectors.

Removal and Replacement

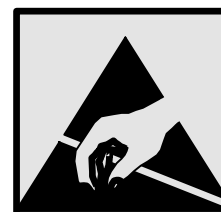
This chapter tells you how to remove and replace the OmniBook's removable components and assemblies. The items marked by • in the following table are user-replaceable.

Table 2-1. Removal Cross-Reference

• Battery, main (page 2-4). - Battery, CMOS (page 2-29). • Bumpers, display (page 2-12) • Cap, pointing stick (page 2-12). • Card, mini-PCI (page 2-9). - Case, bottom (page 2-22). - Case, top (page 2-20). - Cover, center hinge (page 2-29). • Cover, left corner (page 2-12). - Cover, left hinge (page 2-29). • Cover, mini-PCI (page 2-12). • Cover, SDRAM (page 2-12). • Cover, right corner (page 2-12). - Cover, right hinge (page 2-29). • Covers, screw (page 2-12). - CPU module (page 2-18). - Display assembly (page 2-12). - Doors, docking (page 2-24).	- Doors, PCMCIA (page 2-24). • Drive, hard disk (page 2-7). • Feet, rubber (page 2-12). - Heatsink (with fan) (page 2-17). - Keyboard (page 2-15). - Panel, sound/IR (page 2-29). - Panel, mini-PCI (page 2-29). • Panel, power button (page 2-11). - Panel, vent (page 2-29). - PCA, display interface (page 2-29). - PCA, power supply (page 2-29). - PCA, motherboard (page 2-22). - PCA, volume (page 2-29). • Plug-in module (page 2-5). • SDRAM module (page 2-6). - Socket, PCMCIA (page 2-29). • Tray, hard disk drive (page 2-7).
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Caution

Always provide proper grounding when performing repairs. Without proper grounding, an electrostatic discharge can damage the OmniBook 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 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 unit. (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 OmniBook to access any particular component.

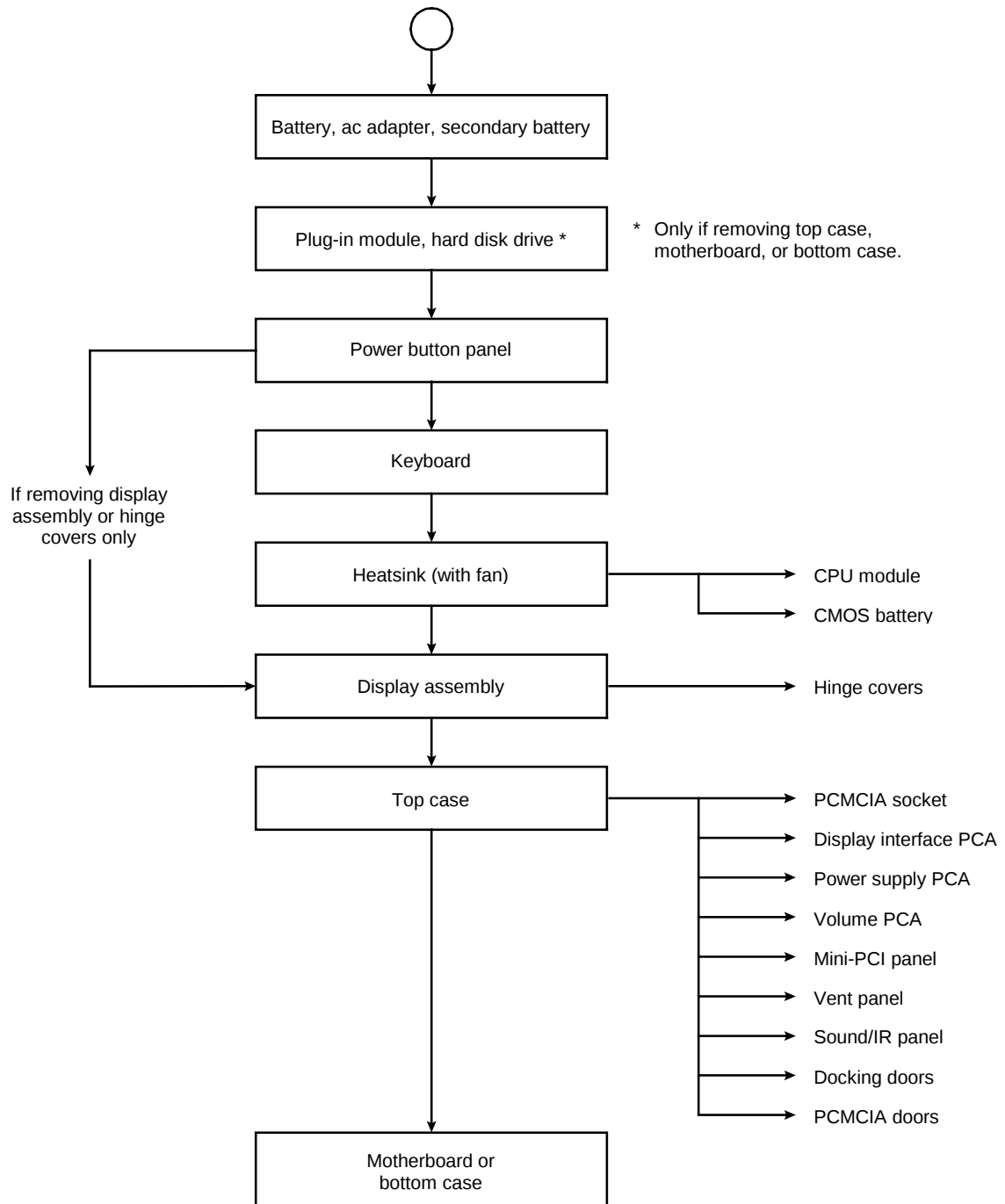


Figure 2-1. Disassembly Flow

Table 2-2. Required Equipment

- Small Phillips screwdriver, preferably magnetized.
- Small flat-blade screwdriver.
- IC (PLCC) removal tool (similar to OK Industries EX-5).

Table 2-3. Recommended Screw Torques

Screw Thread Size	Torque (cm-kgf)	Torque (in-lbf)
M2	1.3 – 1.8	1.1 – 1.5
M2.5 (2–11 mm long)	3.0 – 3.5	2.6 – 3.0
M2.5 (12–19 mm long)	2.5 – 3.0	2.2 – 2.6
M3	3.0 – 3.5	2.6 – 3.0

Removing the Battery

(User-Replaceable)

Required Equipment

- None.

Removal Procedure

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

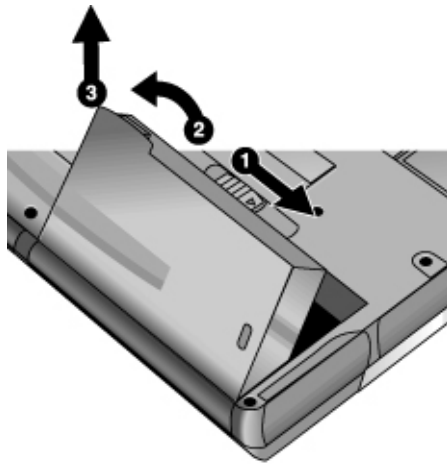


Figure 2-2. Removing the Battery

Reassembly Notes

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

Removing a Plug-In Module (User-Replaceable)

Required Equipment

- None.

Removal Procedure

1. Press the button on the module release latch, and slide the latch toward the front of the computer.



Figure 2-3. Removing a Module

2. Grasp the module and pull it out.

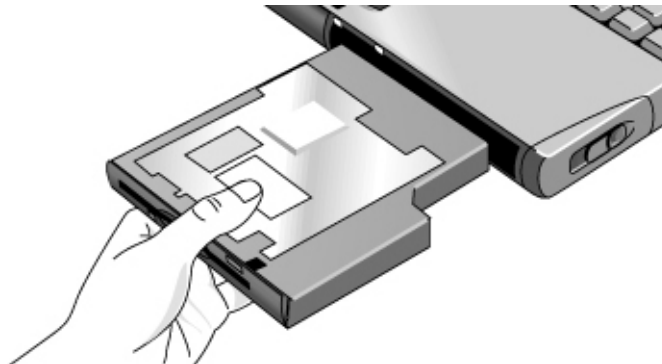


Figure 2-4. Removing a Module

Removing an SDRAM Module (User-Replaceable)

The OmniBook 6000 has no SDRAM on its motherboard, but has two slots for that hold two SDRAM modules. One slot contains a SDRAM module installed at the factory.

Table 2-4. SDRAM Module Replacement Part Numbers

Description	Part Number	Exchange Part Number
SDRAM module, 32-MB (100 MHz)	1818-7950	
SDRAM module, 64-MB (100 MHz)	1818-7951	F1660-69103
SDRAM module, 128-MB (100 MHz)	1818-7952	F1660-69104
SDRAM module, 256-MB (100 MHz)	1818-7953	F1654-69101

Caution

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

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Turn the unit bottom-side up, loosen the screw holding the SDRAM cover (the cover retains the screw), and remove the cover.
3. Release the two latches at the sides of the SDRAM module, so the free edge of the board pops up.
4. Pull the board out of the connector.

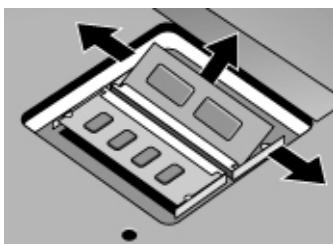


Figure 2-5. Removing a SDRAM Module

Reassembly Notes

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

Removing the Hard Disk Drive

(User-Replaceable)

Table 2-5. Hard Disk Drive Replacement Part Numbers

Description	Part Number	Exchange Part Number
Drive, hard disk (5 GB, 9.5 mm, Hitachi)	0950-3825	F2072-69103
Drive, hard disk (6 GB, 9.5 mm, Hitachi)	0950-3732	F1660-69108
Drive, hard disk (6 GB, 9.5 mm, IBM)	0950-3710	F1711-69106
Drive, hard disk (10 GB, 9.5 mm, IBM)	0950-3831	F2072-69104
Drive, hard disk (12 GB, 9.5 mm, Hitachi)	0950-3733	F1660-69107
Drive, hard disk (18 GB, 12.7 mm, IBM)	0950-3712	F1660-69106

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Turn the unit bottom side up and remove both hard drive screws.
3. Raise the cover on the end of the drive so that its retainer tab is free of the computer casing, then gently pull the hard drive out of the computer.

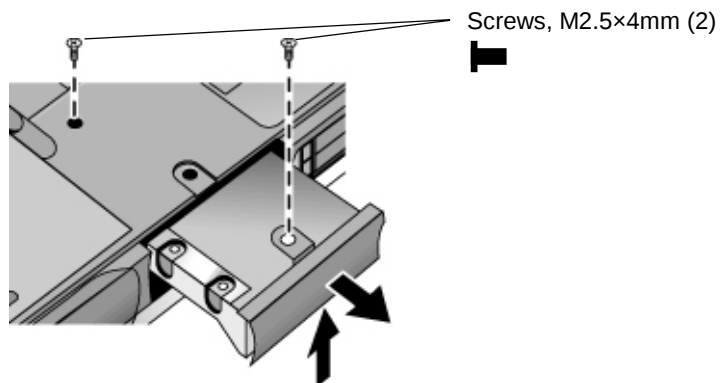


Figure 2-6. Removing the Hard Disk Drive

4. Remove all six screws from the holder and drive case, then lift the drive out of the holder.
5. Notice that the hard drive has a pin connector attachment at one end. Carefully remove this connector from the end of the drive. Work alternately at each end so that the connector slides off evenly without bending the connector pins.

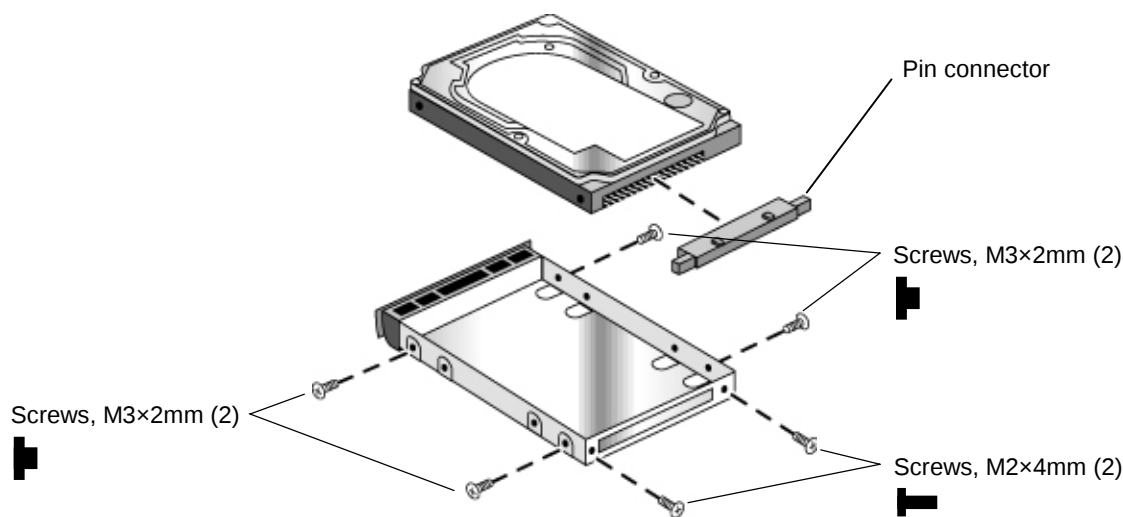


Figure 2-7. Removing the Hard Disk Case

- Slide the cover down into place so the retainer tab engages the casing.
- 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.
- Of the six screws that go in the holder and drive case, the thinner screws go nearest the connector.

Important

If you are installing a new hard drive, create a Hibernate partition on the drive before loading any software—see “Creating a Hibernate Partition,” below.

Creating a Hibernate Partition

When you install a new hard drive, always create a Hibernate partition on the drive before loading any software.

1. Plug in the ac adapter.
2. Insert the *Recovery CD* in the CD-ROM drive.
3. Shut down and restart the computer. When you see the HP logo, press ESC twice.
4. Select the CD or DVD drive as the boot device.
5. When the *Recovery CD* dialog box appears, follow the displayed instructions. If prompted, accept the recommended partition size. If you install the factory software, the recovery process can take up to 10 minutes.

If you want to create the Hibernate/diagnostics partition without installing the factory software, click Advanced and select the option to not install the operating system.

6. When prompted to reboot the computer, press CTRL+ALT+DEL and follow any instructions that appear onscreen.

Removing the Mini-PCI Card (User-Replaceable)

Certain OmniBook models include a mini-PCI card.

Table 2-6. Mini-PCI Card Replacement Part Numbers

Description	Part Number	Exchange Part Number
Card, mini-PCI (LAN/modem)	F2072-60902	
Card, mini-PCI (SW modem)	F2072-60903	

Caution

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

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Loosen the screw holding the mini-PCI cover (the cover retains the screw), and remove the cover.
3. Release the latches at the sides of the board, so that the free edge of the board pops up.
4. Detach all the cables from the board.
5. Gently pull the board out of its connector.

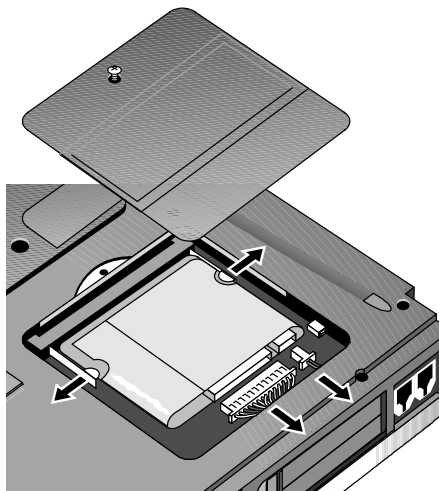


Figure 2-8. Removing the Mini-PCI Card

Reassembly Notes

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

Removing the Power Button Panel

(User-Replaceable)

Required Equipment

- Small flat-blade screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Carefully insert the screwdriver blade under the power button panel along the edge shown below, and gently pry up the center of the cover.
3. Insert a thumb or finger under the center of the panel, and lift the panel out.



Figure 2-9. Removing the Power Button Panel

Reassembly Notes

- Insert the left end of the panel into the top case, and press the panel into place.

Replacing Small Parts

(User-Replaceable)

The user can replace the following small parts.

Table 2-7. Replacing Small Parts (User-Replaceable)

Part	Replacement Procedure
Cap, pointing stick	Pull the cap off the pointing stick.
Bumpers, display (on display bezel)	Insert a small flat-blade screwdriver under the bumper and pry it loose. To replace, firmly press the adhesive side of the bumper into the recess.
Cover, mini-PCI	On the bottom of the computer, loosen the screw in the mini-PCI cover (the cover retains the screw) and remove the cover.
Cover, SDRAM	On the bottom of the computer, loosen the screw in the SDRAM module cover (the cover retains the screw) and remove the cover.
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.
Covers, left/right corner	From the bottom of the computer, remove the screws holding the corner covers, then remove the covers.
Feet, rubber (on bottom of unit)	Insert a small flat-blade screwdriver under the foot and pry it loose. To replace, firmly press the adhesive side of the foot into the recess.

Removing the Display Assembly

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove the power button panel (page 2-11).
3. From the back of the computer, remove the two screws near the PS/2 keyboard/mouse port, and the two near the ac adapter jack.
4. From the bottom of the computer, remove the two screws from the rear corners.
5. Open the display. Remove the screw from the display's ground wire, and disconnect the main cable.
6. Remove the screws from the center hinge cover, and from the left and right hinges.
7. Lift the display off of the computer.

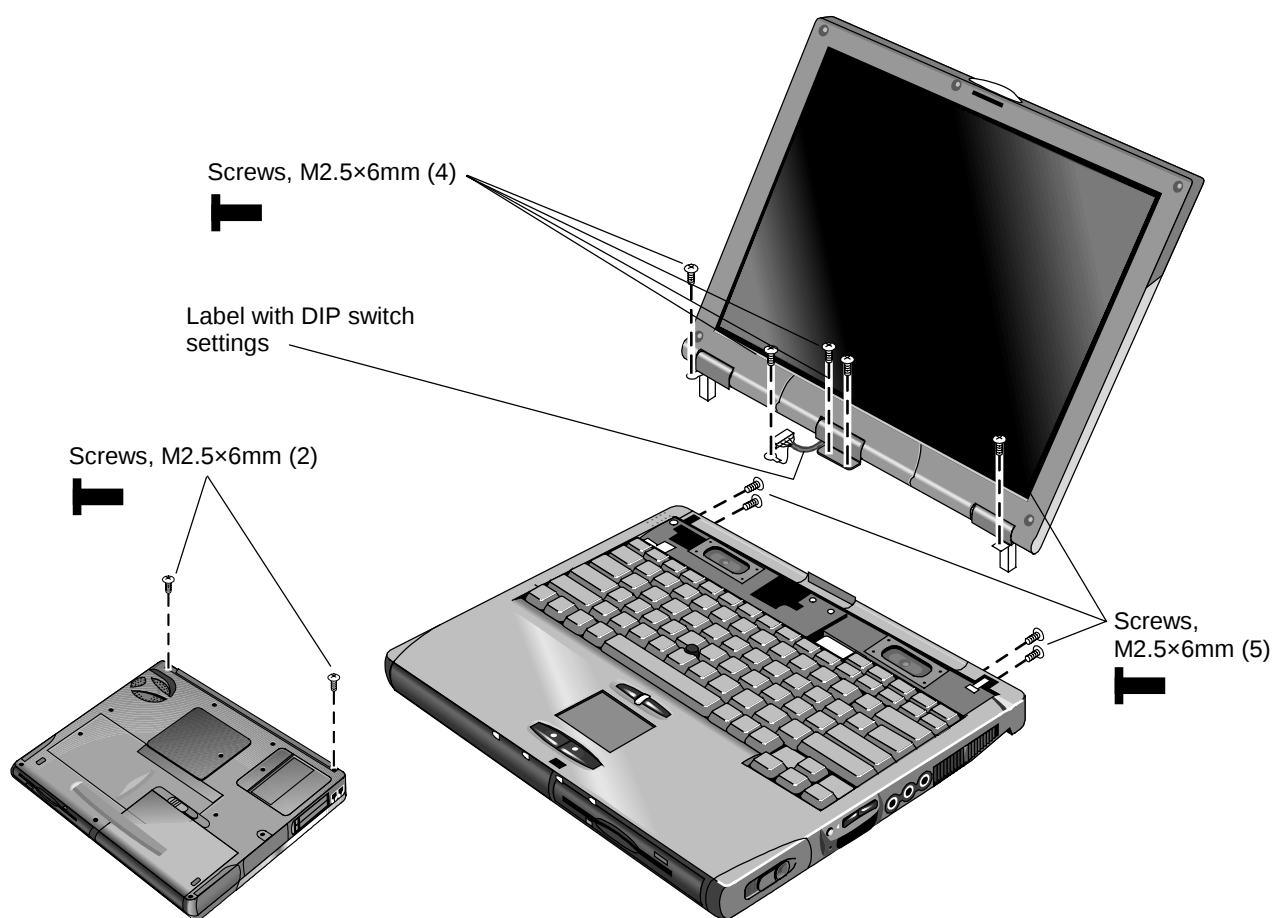


Figure 2-10. Removing the Display

Reassembly Notes

- Before installing any screws, make sure the center hinge cover fits over the tab in the bottom case.

Important

- Make sure the DIP switches on the display interface PCA match the settings shown on the label on the display cable, or you risk damaging the display.
- If you change the DIP switches, you must also reprogram the EEPROM for the new display—see page 2-26. If the EEPROM is not programmed correctly, the display will not turn on.

Removing the Keyboard

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove the power button panel (page 2-11).
3. From the bottom of the unit, remove the single screw marked with a “K.”

Caution

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

4. Remove the four retaining screws from the tabs along the back end of the keyboard.

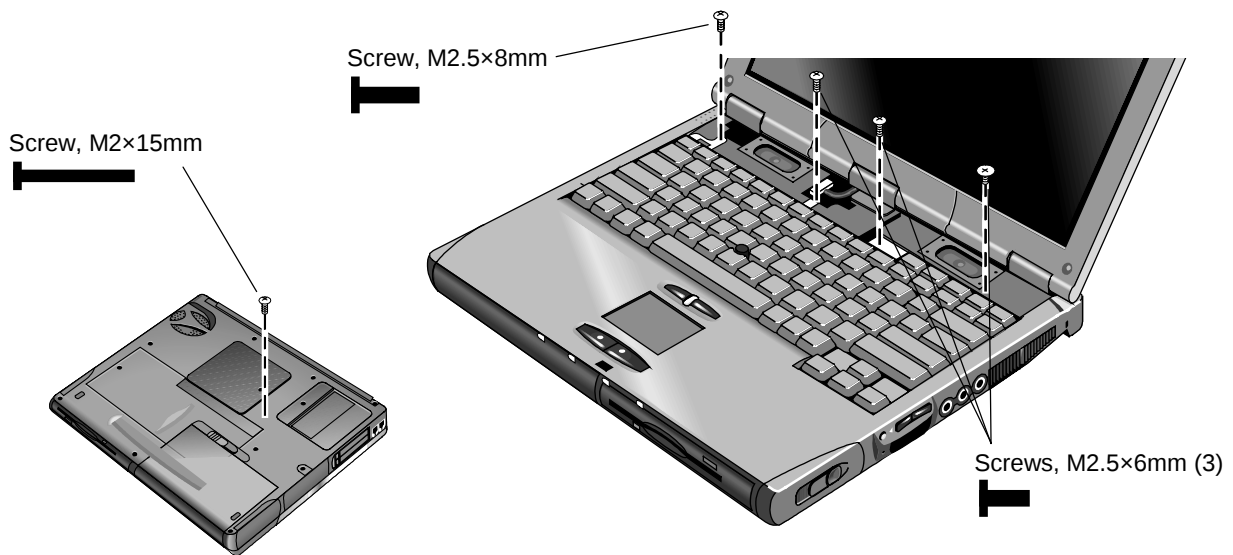


Figure 2-11. Removing the Keyboard

5. Raise the back end of the keyboard, then lift the keyboard out of the computer. Be careful not to pull on the cables connecting the keyboard to the computer.
6. Lay the keyboard face down on the top case, slightly forward of its normal position. Be careful not to pull on the cables.
7. Release the pointing stick flex cable (narrow) from the motherboard, and disconnect the keyboard flex cable (wide).

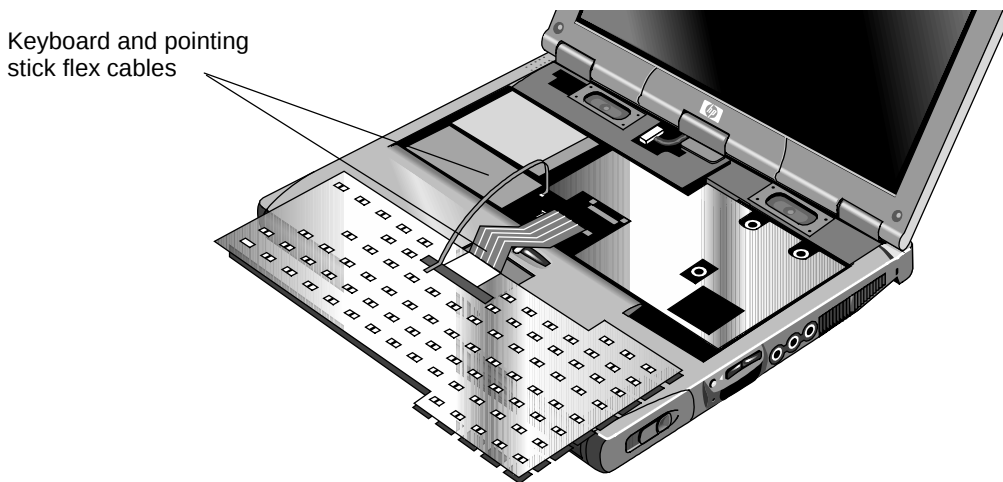


Figure 2-12. Unplugging the Keyboard Cables

Reassembly Notes

- Lay the keyboard face down on the top case slightly forward of its normal position, then reconnect the keyboard and pointing stick flex cables.
- 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 Heatsink (with Fan)

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove these additional assemblies:
 - Power button panel (page 2-11).
 - Keyboard (page 2-15).
3. Disconnect the fan cable through the opening in the heatsink.
4. Remove the five retaining screws.
5. Lift the heatsink out of the unit.

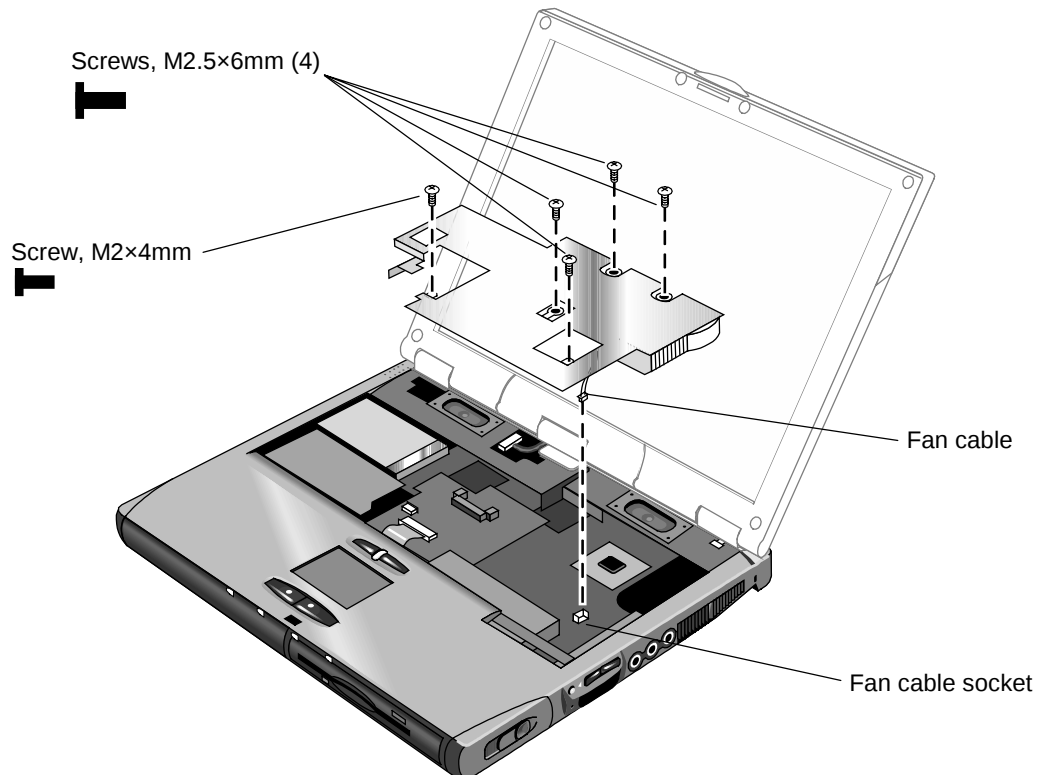


Figure 2-13. Removing the Heatsink

Removing the CPU Module

(HP Authorized Service Providers Only)

Table 2-8. CPU/Motherboard Component Compatibility

	Pentium III models	Celeron models
CPU module	F1979-69101 (600/500 MHz) F1980-69101 (650/500 MHz) F2072-69102 (700/600 MHz)	F2072-69101 (550 MHz)
PCA, motherboard	F2072-60913	F2072-60914

Required Equipment

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

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove these additional assemblies:
 - Power button panel (page 2-11).
 - Keyboard (page 2-15).
 - Heatsink (page 2-17).
3. Turn the lock screw one-half turn counterclockwise to release the CPU module, and remove the CPU module from the motherboard.

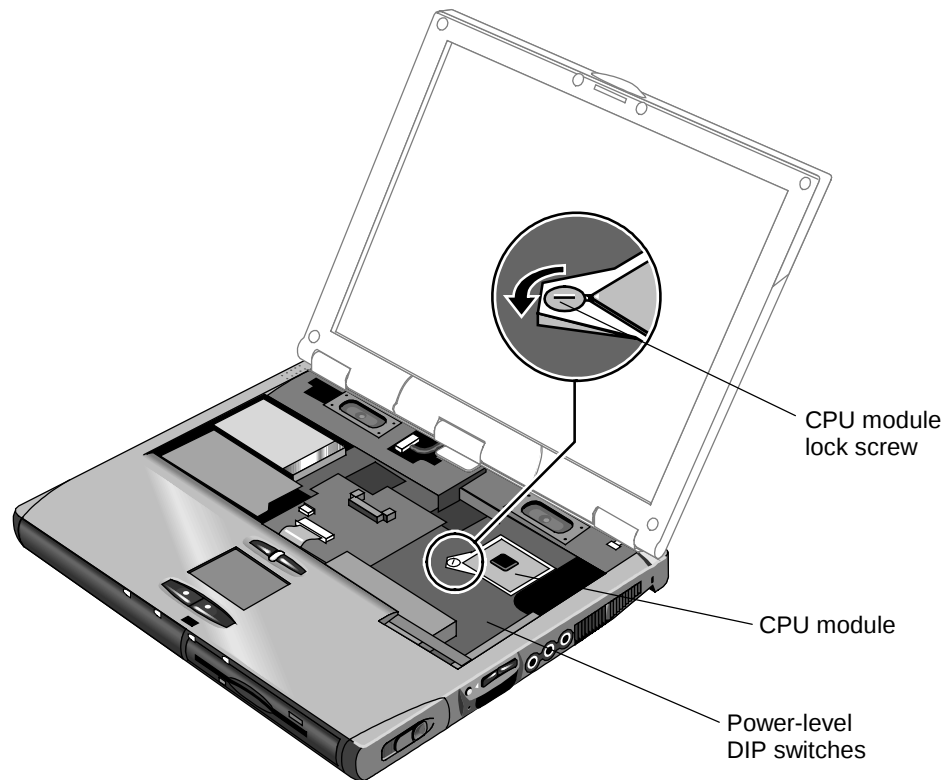


Figure 2-14. Removing the CPU Module

Reassembly Notes

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

Note: Setting the SpeedStep Power Level DIP Switches

Whenever you install a new CPU, you must make sure the SpeedStep power level DIP switches are set correctly for that CPU. These switches are located on the motherboard next to the volume PCA, and control the power level to the CPU in the SpeedStep high-speed mode.

The settings to use depend on the "Q" batch number printed on the upper surface of the CPU. The following settings are for batch number Q49:

1: ON 2: ON 3: ON 4: OFF 5: ON 6: not used

For other batch numbers, see the appropriate Service Note.

Removing the Top Case

(HP Authorized Service Providers Only)

Required Equipment

- Small Phillips screwdriver.

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove these additional assemblies:
 - Power button panel (page 2-9).
 - Keyboard (page 2-15).
 - Heatsink (page 2-17).
 - Display assembly (page 2-13).
 - Plug-in module (page 2-5).
 - Hard disk drive (page 2-7).
3. From the bottom of the computer, remove the screws holding the left and right corner covers, then remove the covers.

Hint

The right corner cover may come off more easily if you slide the plug-in module latch forward.

4. Remove the four retaining screws from the bottom case.
5. Remove the two retaining screws located just inside the hard disk drive compartment.
6. Remove the single screw inside the battery compartment.
7. From the top of the computer, disconnect the speaker wires and the touch pad flex cable.
8. Remove both retaining screws: one to the left of the right speaker, and one to the right of the touch pad flex cable.
9. Remove the screw from the tab near the upper click buttons.
10. Raise the back of the top case, then lift it off the computer.

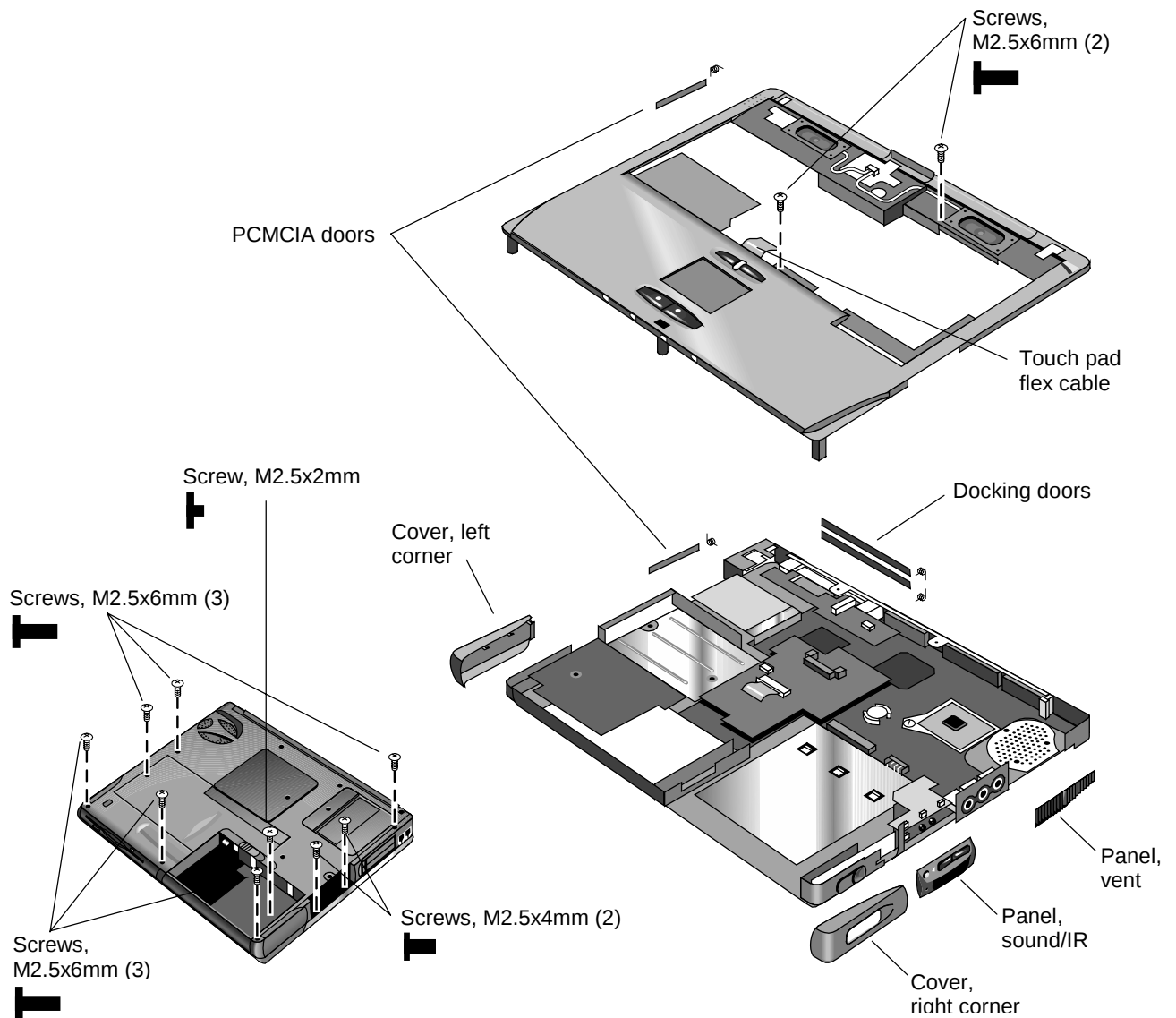


Figure 2-15. Removing the Top Case

Reassembly Notes

- If you need to reinstall the sound/IR panel, make sure the volume control is oriented properly (pins facing inward). Insert the tabs on the end of the panel into the slots in the bottom case.
- When reinstalling the right corner cover, first insert the tab at the back end of the cover into the case, then move the plug-in module latch forward and snap the cover over the latch and into place.

Caution

Be careful not to pinch the speaker wires when reinstalling the nearby retaining screws.

Removing the Motherboard or Bottom Case

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

Note: When Replacing the Motherboard

If possible, record the computer's Service ID before you replace the motherboard. (You will then store the Service ID in the EEPROM on the new motherboard PCA.) Do this using the Service Utility disk—see page 2-26.

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove these additional assemblies:
 - Plug-in module (page 2-5).
 - Hard disk drive (page 2-7).
 - Power button panel (page 2-11).
 - Keyboard (page 2-15).
 - Heatsink (page 2-17).
 - Display assembly (page 2-13).
 - Top case (page 2-20).
3. From the bottom of the computer, remove the three screws from the bottom case.

4. From the top of the computer, remove the six screws that attach the motherboard to the bottom case.
5. Bend the casing that surrounds the audio connectors outward slightly to release the connectors.
6. Lift the motherboard off of the bottom case.

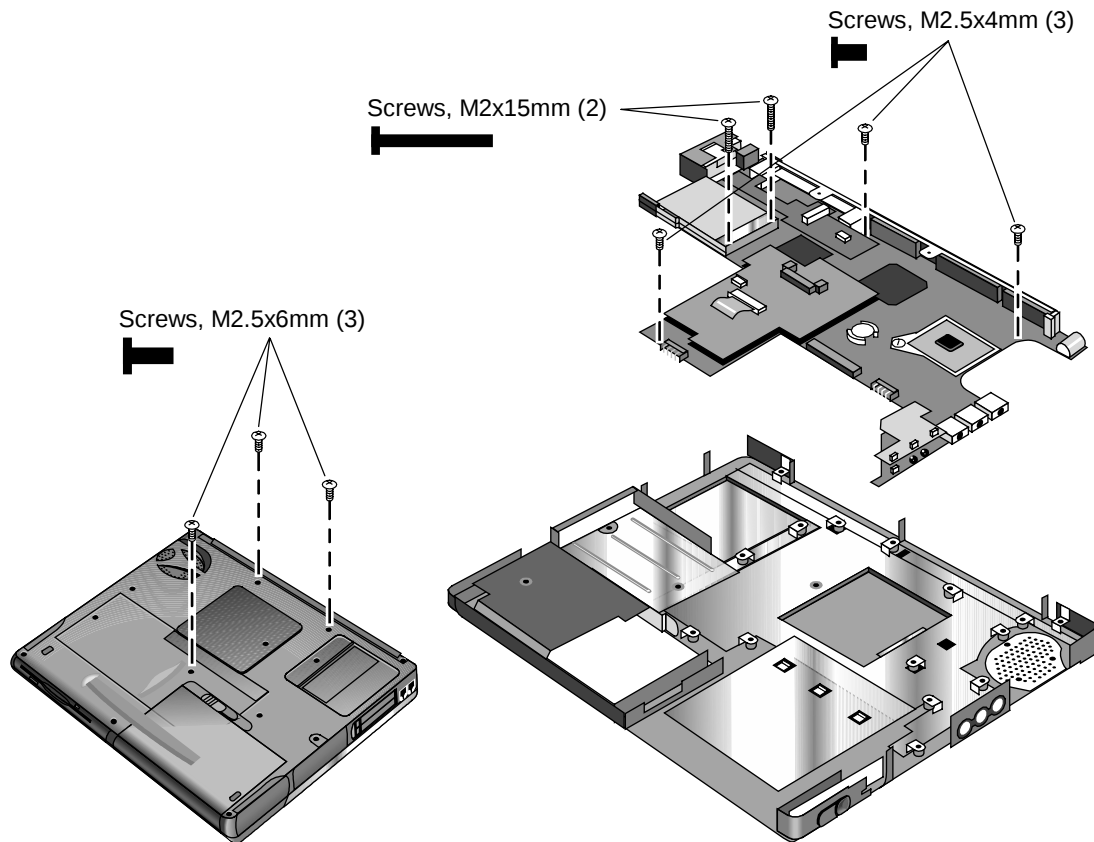


Figure 2-16. Removing the Motherboard

Reassembly Notes

- Insert the audio connectors through their openings in the bottom case, then lower the motherboard into place.
- When reinstalling the sound/IR panel, make sure the volume control is oriented properly (pins facing inward). Insert the tabs on the end of the panel into the slots in the bottom case.
- When installing the vent panel, insert the pin on the back end of the panel under the bracket on the bottom case.

- If you need to install or replace the docking or PCMCIA doors, see the figures below.

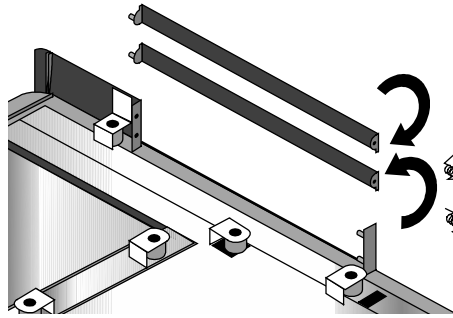


Figure 2-17. Installing Docking Doors

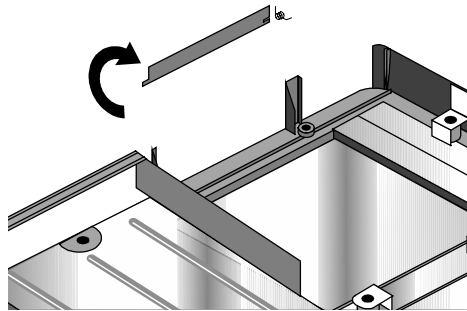


Figure 2-18. Installing the Lower PCMCIA Door

Replacing the Motherboard

Installation Procedure

Caution

Replace the motherboard only with one that is compatible with the OmniBook model and CPU module—see the table on page 2-18.

1. If present, remove the mini-PCI card and mini-PCI panel.
2. Remove the screw from the display interface PCA, and carefully lift the PCA off of the connector underneath.
3. Carefully lift the power supply PCA off of the connector underneath.
4. Remove the screw from the volume PCA, and carefully lift the PCA off of the connector underneath.
5. Turn the lock screw one-half turn counterclockwise to release the CPU module, and remove the CPU module from the motherboard.
6. Install the above components from the old motherboard on the new motherboard.

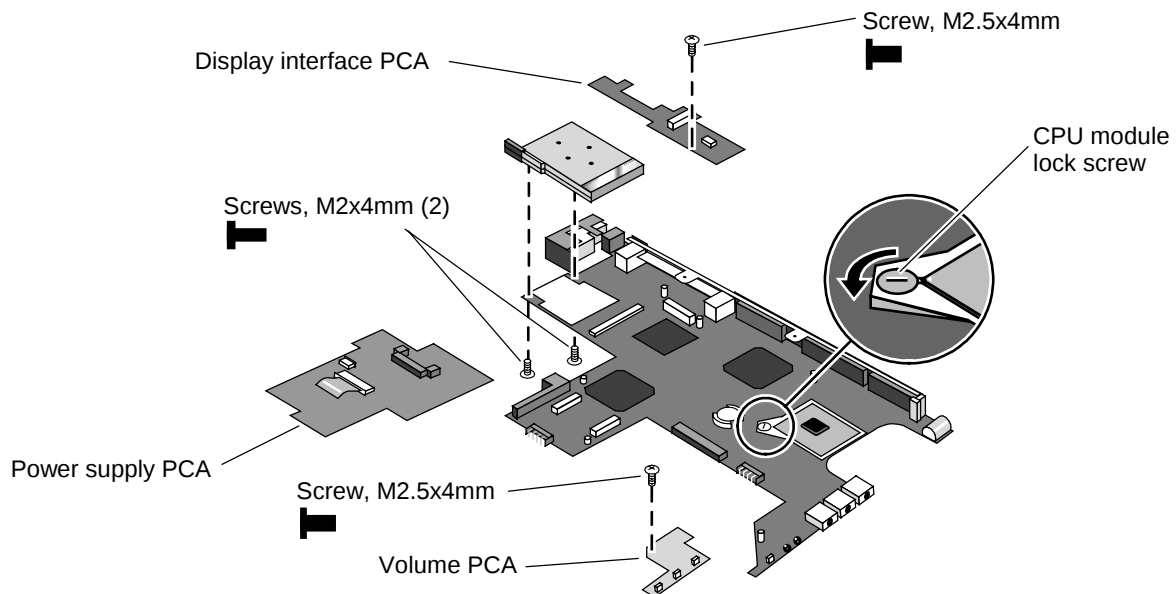


Figure 2-19. Replacing Motherboard Components

7. Make sure the SpeedStep power level DIP switches on the motherboard are set correctly for the CPU. See the note on page 2-19.
8. Follow the “Reassembly Notes” on page 2-23.
9. Store the service ID, serial number, keyboard layout, and display information electronically in the new motherboard, and reprogram the EEPROM on the new motherboard with the proper settings for the display—see page 2-26. If the EEPROM is not programmed correctly, the display will not turn on.

Storing Unit Information Electronically

When replacing a motherboard PCA, you will need to download the OmniBook 6000 service package from the Partnership Web site (see page vi). This package contains the following:

- Image for creating a bootable Display Update floppy disk.
- Image for creating a bootable Service Utilities floppy disk.
- Readme file that explains how to create and use the above floppy disks.

Use the Display Update floppy disk and Service Utilities floppy disk as described in the Readme file to update the following data in the EEPROM on the motherboard:

- LCD operating information.
- Computer's serial number.
- UUID (unique network ID).
- Service ID.

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. Follow the “Reassembly Notes” on page 2-23.

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. Store it with other Word templates on a PC connected to a laser printer. The latest version includes fields for warranty period and manufacturing location.

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

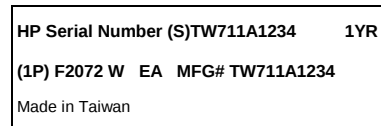


Figure 2-20. Example of Serial Number Label

Repairing the BIOS IC

(HP Authorized Service Providers Only)

The BIOS IC of the OmniBook 6000 is not replaceable:

- If the BIOS IC is defective, you must replace the power supply PCA.
- However, if the BIOS IC might only be corrupted, you can attempt to repair it using a Crisis Recovery floppy—see the information below.

Note: Reprogramming the BIOS IC

A new BIOS IC contains only enough basic programming to boot the OmniBook. After installing a new power supply PCA, you must reprogram the BIOS IC, preferably with the latest BIOS. You can download the latest BIOS from the HP Notebook Web site (see page vi)—follow the directions provided.

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

Caution

Make sure you are using the correct BIOS Crisis Recovery floppy for the OmniBook model you are repairing. The program does not verify the OmniBook model, so you could install the wrong BIOS image.

1. Insert the BIOS Crisis Recovery floppy in the floppy drive.
2. If the computer does not boot from the BIOS Crisis Recovery floppy, try plugging the boot-block jumper into the OmniBook parallel port, then go to the next step. See the wiring diagram below.
(In many situations you can skip this step—especially if the computer previously displayed a BIOS checksum error.)

3. Turn on the computer and allow it to boot from the floppy disk.

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

- Unplug the ac adapter.
 - Press and hold Fn+B.
 - Plug in the ac adapter.
 - Release Fn+B.
4. Wait while the BIOS is reprogrammed—the display is blank for a minute or more while this happens.
If you plugged in a boot block jumper, unplug it before the computer automatically reboots.
 5. After the BIOS is repaired and reprogrammed, check the BIOS version to see whether it is the latest version. If necessary, reprogram the BIOS IC—see the note at the beginning of this topic.

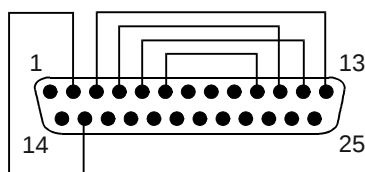


Figure 2-21. Boot-Block Jumper

Removing Other Components

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

1. Unplug the ac adapter, if present, and remove the battery. Remove the secondary battery if one is installed.
2. Remove the assemblies and follow the additional steps given in the table below.

Table 2-9. Removing OmniBook Components

Component	Removal Procedure	Additional Steps
Battery, CMOS	Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17).	Reassembly Notes: After replacing the CMOS battery, set the correct time and date using the BIOS Setup utility or Date/Time in the Control Panel.
Case, bottom	See page 2-22.	
Case, top	See page 2-20.	
Covers, hinge (left, right, or center)	Power button panel (page 2-11). Display assembly (page 2-13).	Caution: When removing the center hinge cover, be careful not to pull on or damage the display cable. Reassembly Notes: Make sure the center hinge cover fits over the tab in the bottom case.
CPU module	See page 2-18.	
Display assembly	See page 2-13.	
Doors, docking	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	See the figure on page 2-24.

Component	Removal Procedure	Additional Steps
Doors, PCMCIA	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	See the figure on page 2-24.
Heatsink (with fan)	See page 2-17.	
Keyboard	See page 2-15.	
Panel, sound/IR	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	Reassembly Notes: Make sure the volume control is oriented properly (pins facing inward). Insert the tabs on the ends of the panel into the slots in the bottom case.
Panel, mini-PCI	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	On the rear of the computer, remove the screw at the far left end (nearest the mini-PCI panel).
Panel, vent	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	Reassembly Notes: Insert the pin on the back end of the panel under the bracket on the bottom case, and the tabs on the ends of the cover into the slots in the bottom case.
PCA, display interface	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	Remove the screw from the board (see the figure on page 2-25), and carefully lift the board off of the connector underneath. Reassembly Notes: Make sure the DIP switches on the new display interface PCA match the settings shown on the label on the display cable, or you risk damaging the display.

Component	Removal Procedure	Additional Steps
PCA, power supply	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	Carefully lift the board off of the connector underneath (see the figure on page 2-25). Reassembly Note: The BIOS IC on a new power supply PCA contains only enough basic programming to boot the OmniBook. After installing the new PCA, you must reprogram the BIOS IC, preferably with the latest BIOS. You can download the latest BIOS from the HP Notebook Web site (see page vi)—follow the directions provided.
PCA, motherboard	See page 2-22.	
PCA, volume	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	Remove the screw from the board (see the figure on page 2-25), and carefully lift the board off of the connector underneath.
Socket, PCMCIA	Plug-in module (page 2-5). Hard disk drive (page 2-7). Power button panel (page 2-11). Keyboard (page 2-15). Heatsink (page 2-17). Display assembly (page 2-13). Top case (page 2-20).	1. On the bottom of the computer, loosen the screw holding the mini-PCI cover (the cover retains the screw), and remove the cover. 2. Remove both screws (M2x4mm) from inside the mini-PCI compartment. 3. Remove the two screws attaching the socket to the motherboard (see the figure on page 2-25). 4. Unplug the PCMCIA socket from the motherboard.

Troubleshooting and Diagnostics

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

- Troubleshooting information
 - Troubleshooting the problem (page 3-3).
 - Verifying the repair (page 3-3).
 - Suggestions for troubleshooting (page 3-4).
- Diagnostic tools
 - OmniBook DiagTools diagnostic program (page 3-14).
 - Power-on self-test (page 3-21).
 - Sycard PCCtest 450 PC Card (page 3-24).
 - Desktop Management Interface (page 3-25).
 - BIOS Setup utility (page 3-27).

Troubleshooting

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

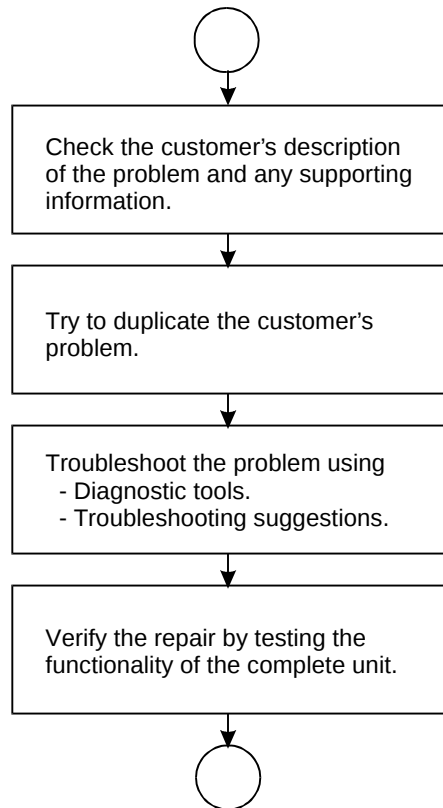


Figure 3-1. Basic Troubleshooting Steps

Troubleshooting the Problem

Record pertinent information about the unit:

- Model and serial number.
- Operating system and version.
- 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, take note of 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 possible causes.
 - The DiagTools diagnostic program tests most components of the OmniBook'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. The table on page 3-4 shows how you can use these tools to isolate the cause of the computer's problem.
 - The troubleshooting suggestions on page 3-5 include general suggestions for repairing units with specific failure symptoms.

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

After you replace a module, the computer 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 computer and starts it in a known state.

Verifying the Repair

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

- **DiagTools Basic Diagnostic Test.** Run the basic test of the DiagTools diagnostic program (page 3-14).
–and–
- **Function Tests.** Run tests that check the repaired function, such as in the DiagTools diagnostic program (page 3-14).
–and–
- **Failed Tests.** Run any other tests that failed during troubleshooting.

Suggestions for Troubleshooting

Table 3-1. Scope of Diagnostic Tools

Function	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				Describes	
Display	Tests (Video menu)			Describes	
Hard disk	Tests (IDE menu)	Tests		Describes	Configures
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)				Configures
Serial	Tests* (Misc menu)			Describes	Configures
Parallel	Tests* (Misc menu)			Describes	Configures
LAN	Tests** (User menu)			Describes	
Modem	Tests** (User menu)				
Infrared	Tests† (Misc menu)			Describes	Configures
PS/2 port	Tests† (KBD, Misc menus)				
USB	Tests† (USB menu)			Describes	
Docking port	Tests (using docks)				
PCMCIA	Tests (Misc menu)		Tests	Describes	
ac adapter				Status	
Docking products	Tests ports and internal bus			Status	Configures
CD-ROM drive	Tests (IDE menu)	Tests (with boot CD)		Describes	Configures
Other plug-in modules				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 card, 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 the figure on page 1-13 and the table on page 1-14.			
Startup			
Does not boot on ac or battery.	Check the power source. Press the system-off switch to reset the computer. Press the blue sleep button to turn the computer on. Unplug the ac adapter and remove all batteries, then reconnect power. Remove all but one SDRAM modules and try again. Reinsert any other SDRAM modules and try again.	ac adapter. SDRAM module. CPU module. Power supply PCA. Display interface PCA. Motherboard. Display assembly. Hard drive.	Check ac adapter. Remove any SDRAM modules and retry. If power status light does not turn on, reprogram BIOS, replace power supply PCA, 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 display interface PCA, replace display interface, replace motherboard. If power status light and display turn on, 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, reload 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.	Check battery level on battery LEDs. Check battery contacts. If available, try another battery.	Battery or contacts. Motherboard.	
Does not boot from floppy drive.	Make sure the floppy disk is bootable. Make sure the floppy drive is installed or connected correctly. Use BIOS Setup to check the boot order and to make sure that floppy boot is enabled. Try using alternate connection (with or without floppy cable).	Floppy drive or contacts. Floppy cable. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Does not boot from a CD or DVD in the CD/DVD drive	Make sure the CD or DVD is bootable. Use BIOS Setup to check the boot order. Restart the computer. Test the DVD drive with the DiagTools diagnostics.	CD/DVD drive module. Motherboard.	
Error message such as "Invalid system disk" or "Auto IDE error".	Check for a disk in floppy drive. Check boot order in BIOS Setup. Remove and reinsert hard drive.	Hard drive contacts. Hard drive.	If unit boots from floppy drive, check for corrupt files on hard drive, reload hard drive, replace hard drive.
Sluggish startup or shutdown.	Run ScanDisk and Disk Defragmenter to check and optimize the hard drive. Delete temporary and unneeded files.		Use the suggestions shown at left.
Password has been forgotten.	Verify proper ownership, then follow the removal procedure with the owner and log the appropriate data—see page 5-1.		The user must call Technical Support and provide proof of ownership. Password removal is restricted to certain sites. See page 5-1.
Power/Battery			
Short battery operating time.	Turn down display brightness. Check power management settings in BIOS Setup. Try the default settings. Shut down and restart. During boot at the F2 prompt, press F6. This starts a process that recalibrates the battery gauge, possibly improving operating time. When the discharge cycle ends, you may have to unplug and reconnect the ac adapter to begin recharging. Certain applications can cause excess power usage. (User can get the Intel Power Monitor from www.intel.com and monitor CPU load.) 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.
Does not run on battery; empty battery indication.	Check the battery and contacts. If one is available, try another battery.	Battery or contacts. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Battery does not charge.	Check the power source. Check the battery contacts. If available, try another battery and ac adapter. Move the computer away from any nearby heat source. Unplug the ac adapter and allow the battery to cool down. Check for blocked air vents.	Battery or contacts. ac adapter. Motherboard. Heatsink.	Check battery and ac adapter. Check heatsink.
Secondary battery does not charge.	Check the power source. Make sure main battery is fully charged. If not, secondary battery will not charge. Check contacts on second battery.	Second battery or contacts. Motherboard.	
Battery indicator is inaccurate.	The Time Remaining is an estimate based on how quickly the computer is using power at the moment. It therefore depends on the current task, and assumes that power will be used at the same rate until the battery runs out. So, for example, if the computer 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.		
Display			
Dark display, no light.	Adjust display brightness. Press Fn+F5 several times. Try external monitor.	Display cable connection. Display assembly. Motherboard.	Set DIP switch on display interface PCA to match label on display cable. Reprogram EEPROM for display type—see page 2-26. Check the cable connection. Replace the display assembly. If an external monitor displays no image, replace the motherboard.
White display.	Adjust display brightness.	Display assembly. Display interface PCA.	
Erratic display.		Display cable connection. Display assembly.	
Bright or missing pixels or lines.	See quality statement on page 5-2.	Display cable connection. Display assembly.	See quality statement on page 5-2.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Hard disk			
Hard disk never spins.	Check the power source. Remove and reinsert the hard drive. Check the connector.	Hard drive or connector. Motherboard.	If the drive case is damaged, the drive may not operate properly.
Hard disk makes clunking or scratching noise.	Back up the drive immediately. Was the computer or drive dropped?	Hard drive.	Check the computer and drive for evidence of customer abuse.
Hard disk makes buzzing or whining noise.	Back up the drive immediately. Check for alternate noise sources, such as a PCMCIA drive or fan. If a keystroke causes the sound to change, it may be from the power supply PCA.	Depends on the source of the noise.	
Files are corrupted.	Run the VirusScan program. Check the disk surface by running Scandisk (Windows 95/98) or by using the Tools tab in the disk's Properties sheet (Windows 2000). Test the hard disk drive with the DiagTools diagnostics. Use the <i>Recovery CD</i> to restore original factory software.		Use the suggestions shown at left.
Drive capacity is less than normal.	Check the disk surface by running Scandisk (Windows 95/98) or by using the Tools tab in the disk's Properties sheet (Windows 2000). Check partitions using FDISK (Windows 95/98) or Control Panel, Administrative Tools, Computer Management under Storage (Windows 2000).	Hard drive.	Use the suggestions shown at left. Recreate the Hibernate partition, then partition and format the disk.
Floppy drive			
General problems.	Make sure floppy drive module is installed or connected correctly. Try using alternate connection (with or without floppy cable). Check settings in BIOS Setup.	Floppy drive module or contacts. External floppy drive cable. Motherboard.	
Floppy drive does not work as 3-mode drive.	3-mode drive is not supported when the drive is connected to a dock.	External floppy drive cable. Floppy drive module.	
Keyboard			
Some or all keys do not work properly.	Check settings in BIOS Setup.	Keyboard. Power supply PCA. Motherboard.	Try reinserting the flex cable in the connector on the power supply PCA.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
PS/2 keyboard and mouse with Y-adapter do not work.	Check devices separately.	Y-adapter. PS/2 device. Motherboard.	
Pointing stick			
General problems.	Slide and hold the power button four seconds to reset the computer. Check settings in Control Panel. Make sure pointing stick is enabled in Mouse Properties. Make sure the pointing stick is enabled in BIOS Setup.	Keyboard. Power supply PCA. Motherboard.	Try reinserting the flex cable in the connector on the power supply PCA.
Special pointing stick features not working.	In Mouse Properties, select the Synaptics PS/2 TouchPad driver. (The driver is installed from the directory \hp\Drivers\Touchpad.)	Keyboard assembly. Power supply PCA. Motherboard.	
Touch pad			
General problems.	Slide and hold the power button four seconds to reset the computer. Check settings in Control Panel. Make sure touch pad is enabled in Mouse Properties. Make sure the touch pad is enabled in BIOS Setup. Check pointing stick settings in Control Panel.	Top case. Power supply PCA. Motherboard.	
Special touch pad features not working.	In Mouse Properties, select the Synaptics PS/2 TouchPad driver. (The driver is installed from the directory \hp\Drivers\Touchpad.)	Top case. Motherboard.	
Click button does not work.		Top case. Motherboard.	
Audio			
No sound is audible.	Increase sound volume (Fn+UP and software controls). Check settings in BIOS Setup. Check whether sound is enabled (audio-off button and software controls). Check for sound resource conflicts in Device Manager.	Top case. Volume PCA Motherboard.	Check operation using headphones or external speakers (volume PCA).
Sound does not record.	Check settings in BIOS Setup. Check software controls. Test audio with DiagTools diagnostics.	Display interface PCA. Volume PCA. Motherboard.	Check operation using external microphone (volume PCA).

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Serial/Parallel/USB			
General problems.	Check connections. Check settings in BIOS Setup. Check settings in Control Panel. Test ports with DiagTools diagnostics. For USB: check for latest versions of drivers.	Motherboard.	Use loop-back connector when testing serial or parallel port—see page 3-16.
Modem			
General problems.	In Control Panel, open Modems (Windows 95 or 98) or Phone And Modem Options (Windows 2000). Make sure the parity, speed, word length, and stop bits match on sending and receiving modems. Open the hardware Device Manager. If the modem is disabled, try to enable it. If it has a conflict, try disabling another device. Use an analog telephone line (2, 3, or 4 wires), not a PBX or digital line. In a hotel, ask for a data line. Try disabling error correction and data compression.	Mini-PCI card. Mini-PCI panel. Motherboard.	
LAN/Network			
General problems.	Check connections. Try connecting a different computer to the cable. Check settings in BIOS Setup. Check settings in Control Panel. Make sure the LAN cable is Category 3, 4, or 5 for 10Base-T operation, or Category 5 for 100Base-TX operation. Maximum cable length is 100 meters (330 feet). Run the DiagTools LAN test.	Mini-PCI card. Mini-PCI panel. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Infrared			
General problems.	Infrared is disabled and no drivers installed as shipped. (Drivers are included.) Check settings in BIOS Setup. Remove any PC Cards from the computer (possible IRQ conflict). For fast-IrDA, check for DMA conflict with ECP parallel port.	Motherboard.	
PCMCIA			
General problems.	Restart the computer. Try the card in the other slot or in another computer. If the card requires an IRQ, make sure one is available. Check for conflicts or refresh the device list in Device Manager. Zoomed Video is supported only in the lower slot. Check the HP Notebook Web site for installation instructions (page vi). When using a PC card in a docking system, insert or remove the card while the system is turned on. Download current drivers from the card manufacturer's web site.	PCMCIA socket. Motherboard.	Using a flashlight, look for bent pins inside the PCMCIA socket. If both slots have problems, replace the motherboard. If only one slot has a problem, try replacing the PCMCIA socket.
ac adapter			
Does not power the OmniBook	Try another ac adapter, if available.	ac adapter. Power supply PCA. Motherboard.	The ac adapter cannot be repaired, and must be replaced.
Miscellaneous			
Clock loses time	Plug in ac adapter for 24 hours to charge CMOS battery.	CMOS battery. Motherboard.	Charge CMOS battery.
Computer gets abnormally hot	Always set the computer on a flat surface, so that air can flow freely around and underneath it. Make sure the air vents are clear. Games and other programs that drive CPU usage toward 100% can contribute.	Heatsink.	Check the heatsink for proper fan operation or heatsink damage.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Computer pauses or runs sluggishly	May be normal Windows behavior (background processing can affect response time). Certain background operations (such as VirusScan) can affect performance. Press CTRL+ALT+DEL to see if an application is not responding. Restart the computer. If the hard disk has spun down to conserve power, it can take several seconds to spin up (you can hear this). You can use the BIOS Setup utility to change the hard disk time-out to match the Standby time-out. Some file browsers respond slowly while processing graphics or waiting for broken network connections to time out. Check for overheating—see the previous symptom. If the computer's hard disk drive frequently runs (as indicated by the hard drive light on the front of the computer) while the computer appears to be paused or running slowly, consider installing additional SDRAM. Check the amount of available free disk space. Delete temporary and unneeded files. Run the BIOS Setup utility and set the Power Management Mode to Max. Performance. Run the BIOS Setup utility and turn off Intel SpeedStep Mode.	CPU module. Motherboard.	If computer slows after a period of continuous activity, check heatsink—see the previous symptom.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Computer is still on but stops responding.	Press CTRL+ALT+DEL and end any application that is not responding. Slide and hold the power button four seconds to turn off and reset the computer. Press the blue sleep button to turn the computer back on. If the above fails, insert a straightened paper clip into the system-off switch. Then press the blue sleep button to turn the computer back on.		
Accessories			
Docking product I/O problems	Make sure ac power is connected to the dock. Make sure computer is fully inserted in dock. Check computer's power supply. Check settings in BIOS Setup. Try using the corresponding port on the computer while undocked.	Docking product. Motherboard.	Test the corresponding OmniBook ports while undocked. The port replicator and mini dock are not repairable—they must be exchanged. The docking system is repairable—see its service manual.
General plug-in module problems	Check module contacts. Push system-off button.	Plug-in module or contacts. Motherboard.	Plug-in modules cannot be repaired, and must be exchanged.

Diagnostic Tools

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

- OmniBook DiagTools program (below).
- Power-on self-test (page 3-21).
- Sycard PCCtest 450 PC Card (page 3-24).
- Desktop Management Interface (page 3-25).
- BIOS Setup utility (page 3-27).

OmniBook DiagTools

The DiagTools hardware diagnostic program provides two levels of testing:

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

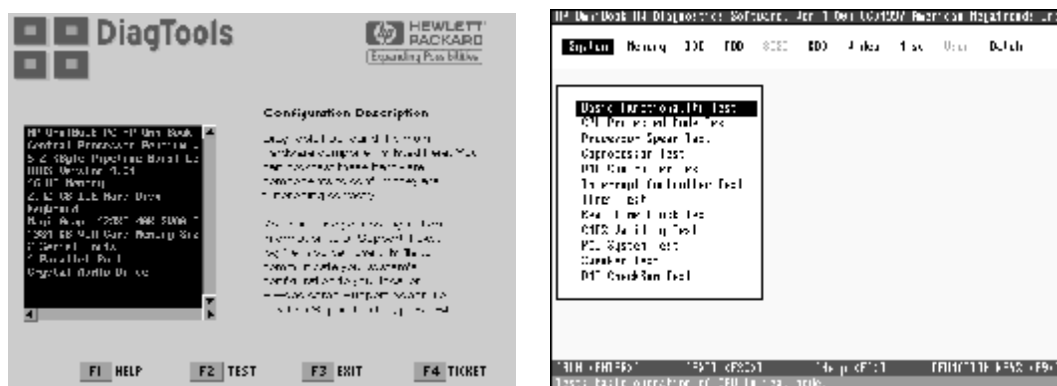


Figure 3-2. OmniBook Diagnostic Screens — Basic and Advanced

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

Updating DiagTools

You can download the latest version of DiagTools from the HP Notebook Web site (see page vi), then follow the included instructions.

Running DiagTools

1. Restart the OmniBook.
2. When the HP logo appears, press F10 to start the diagnostic test.
3. Go through the first several screens.
4. When the hardware detection finishes, check the list of detected hardware. The following information and devices should be listed if applicable:

Product name	Cache memory	Graphics adapter
Processor type	Main memory	Serial ports
BIOS version	IDE drives	Parallel port
Serial number		Audio device

Note

If a device is not detected or fails its test, it might be configured incorrectly in BIOS Setup (page 3-27). You can confirm this by running BIOS Setup and checking the settings.

5. **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.

6. If you intend to exit without running the advanced tests, press F4 to save system and test information in the Support Ticket log file. Then remove the floppy disk, if present, and press F3 to exit.
7. **Run the advanced tests.** Press F2 to open the advanced test screen.
8. Select and run the appropriate tests. Tests are not listed if no such hardware is 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.

If any test fails, the error is logged (error code and description) and displayed temporarily (error code). If several errors occur, look for patterns that might indicate a common cause. See the table on page 3-17 for repair suggestions. Consider these suggestions in combination with other troubleshooting information.

9. When you are finished, press ESC to exit the advanced tests.
10. Press F4 to save system and test information in the Support Ticket log file.
11. **Exit.** Press F3 to exit and reboot.
12. **Optional: Check the log.** The log file contains a hardware summary and a list of all test results and errors. Run C:\Dmi\Hputils\Hpsuppt.exe to retrieve the log file to this directory and open it in Notepad.

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

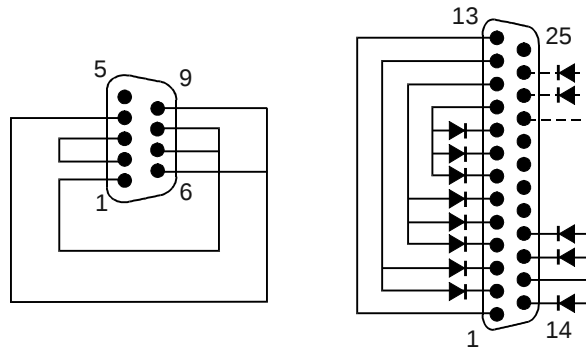


Figure 3-3. Serial and Parallel Loopback Connectors

Interpreting the Results

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

Table 3-3. OmniBook Diagnostic Error Codes

Code	Suggestions	Code	Suggestions
Note: If the BIOS IC appears to be corrupted, you can try to repair it (see page 2-28).		0180h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
System Tests		0181h	Enable external cache memory through BIOS Setup. Replace the CPU module.
0001h – 0008h	Reseat or replace the CPU module.	0182h	Unload HIMEM.SYS or any programs using the extended memory allocated by HIMEM.SYS.
0009h	Replace the power supply PCA. Replace the CPU module. Replace the motherboard.	0183h	Check installation of the SDRAM module. Replace the SDRAM module. Replace the motherboard.
0010h – 0016h	Reseat or replace the CPU module.	0184h	Check installation of the SDRAM module. Replace the SDRAM module. Replace the CPU module. Replace the motherboard.
001Eh	Reseat or replace the CPU module.	0190h – 01A0h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
0020h – 002Fh	Reseat or replace the CPU module.	01A1h – 01A4h	Replace the CPU module.
0030h – 0040h	Replace the motherboard.	01B0h	Test with cache off. Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
0041h	Run BIOS Setup and check IRQ assignments for all devices.	01B1h – 01B2h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
0050h – 0063h	Replace the motherboard.	01B3h	Replace motherboard.
0070h	Replace the CMOS battery.	Hard Disk Tests	
0071h – 0076h	Reset the system, then run BIOS Setup and check settings. Replace the CMOS battery. Replace the motherboard.	0201h	Replace the hard disk. Replace the motherboard.
0077h	Replace the motherboard.	0202h – 0204h	Repeat the test (check test parameters). Replace the hard disk.
0078h	Reset the system, then run BIOS Setup and check settings. Replace the CMOS battery. Replace the motherboard.	0205h	Replace the motherboard.
0079h	Replace the CMOS battery. Replace the motherboard.	0207h	Run BIOS Setup and check the hard disk type. Check hard disk connectors and motherboard connector. Replace the hard disk. Replace the motherboard.
0083h – 008Ah	Reprogram the BIOS IC. Replace the power supply PCA. Replace the motherboard.	0208h – 0209h	Transient DMA error. Repeat the test.
00C0h – 00CCh	Replace the CPU module.	020Ah – 0211h	Repeat the test. Run SCANDISK or equivalent.
Memory Tests		0220h	Replace the motherboard.
The addresses below are absolute (32-bit) addresses, and are not in the segment:offset format.		0240h	Replace the hard disk. Replace the motherboard.
0100h – 0101h	Replace the motherboard.	0252h – 0254h	Repeat the test (check test parameters). Replace the hard disk.
0102h	Reprogram the BIOS IC. Replace the power supply PCA.	025Ah – 0260h	Repeat the test. Run SCANDISK or equivalent. Replace the hard disk.
0120h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.	0265h	Check hard disk connectors and motherboard connector. Replace the hard disk. Replace the motherboard.
0130h	Test with cache off. Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.	0275h	Replace the hard disk.
0131h – 0150h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.	0280h	Check hard disk connectors and motherboard connector. Replace the hard disk. Replace the motherboard.
0160h	Remove all but one SDRAM module and repeat the test. Check the CPU module for shorts. Replace the CPU module. Replace the motherboard.	0281h	Replace the hard disk.
0170h – 0172h	Replace the motherboard.	0290h	Repeat the test. Replace the hard disk.

Code	Suggestions
0293h – 0296h	Replace the hard disk.
02AAh	Check hard disk connectors and motherboard connector. Replace the hard disk. Replace the motherboard.
02CCh	Run BIOS Setup and check the hard disk type. Replace the hard disk. Replace the motherboard.
02EEh	Run BIOS Setup and temporarily select a drive type that has more than 200 cylinders, then repeat the test.
02F1h	Reformat the hard disk. Recreate the Hibernate partition, then run FDISK to partition the hard disk.
02F3h	Run SCANDISK or equivalent. Reformat the hard disk. If necessary, recreate the Hibernate partition, then run FDISK to partition the hard disk.
02F4h – 02F5h	Reformat the hard disk. If necessary, recreate the Hibernate partition, then run FDISK to partition the hard disk.
02FFh	Check hard disk connectors and motherboard connector. 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 Floppy Disk Controller test. Make sure the floppy diskette is fully inserted in the drive. Check that the drive is properly installed in or connected to the notebook. Replace the diskette. Replace floppy drive. Replace the motherboard.
0306h	Replace the floppy drive.
0307h – 030Bh	Run Floppy Disk Controller test. Make sure the floppy diskette is fully inserted in the drive. Check that the drive is properly installed in or connected to the computer. Replace the diskette. Replace floppy drive. Replace the motherboard.
030Ch	Replace the floppy drive.
Keyboard Tests	
0400h – 0401h	Replace the power supply PCA. Replace the motherboard.
0410h – 0414h	Check the keyboard flex cable connection. Replace the keyboard. Replace the power supply PCA. Replace the motherboard.
0415h	Replace the keyboard. Replace the display interface PCA. Replace the power supply PCA. Replace the motherboard.
0416h – 0418h	Replace the keyboard. Replace the power supply PCA. Replace the motherboard.
Serial Port Tests	
0601h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0602h	Replace the motherboard.

Code	Suggestions
0603h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0604h – 0605h	Replace the motherboard.
0606h	For the external loopback test, make sure the loopback connector is installed and constructed properly. For the external or internal loopback test, replace the motherboard.
0607h	Make sure the loopback connector is installed and constructed properly. Replace the motherboard.
0608h – 0617h	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 – 0706h	Replace the motherboard.
0707h	Connect the loopback connector.
0708h	Replace the motherboard.
Audio Tests	
0801h – 0810h	Check speaker connection. Replace the top case. If this error also occurs for an external headphone, replace the motherboard. If it occurs only for an external headphone, replace the volume PCA.
08C0h – 08C2h	Check the speaker connections. Replace the top case. If this error also occurs for an external headphone, replace the motherboard. If it occurs only for an external headphone, replace the volume PCA.
08D0h – 08F3h	Replace the volume PCA. Replace the motherboard.
Video Tests	
0900h – 0905h	Replace the motherboard.
0911h	If this test fails on the internal display, replace the motherboard.
0912h – 0933h	Replace the motherboard.
2100h – 2102h	Replace the display assembly. Replace the display adapter PCA. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
2110h – 2120h	Replace the display adapter PCA. Replace the motherboard. Replace the display assembly.
2130h	Replace the display assembly. Replace the display adapter PCA. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.
2140h – 2141h	Replace the display adapter PCA. Replace the motherboard. Replace the display assembly.
2150h	Replace the display assembly. Replace the display adapter PCA. Replace the motherboard. If error also occurs with external monitor, replace the motherboard.

Code	Suggestions
9016h	Reset the computer. Reprogram the BIOS IC. Replace the power supply PCA. Replace the motherboard.
9017h	See chapter 5 for cosmetic guidelines. If warranted, replace the display assembly.
CD-ROM Tests	
0A00h	Insert a CD in the drive.
0A01h	Repeat the test. Replace the CD-ROM drive.
0A02h	No repair. (Automatic close not supported.)
0A03h	Insert a different CD in the drive and repeat the test. Check the connectors on the CD-ROM drive and motherboard. Replace the CD-ROM 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. Check the connectors on the CD-ROM drive and motherboard. Replace the CD-ROM 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.
ATAPI Removable Tests (LS-120)	
0F01h	Connect the LS-120 drive and repeat the test.
0F02h – 0F03h	Insert a different disk in the LS-120 drive and repeat the test. Check the connectors on the LS-120 drive and motherboard. Replace the LS-120 drive.
0F04h	Replace the LS-120 drive.
0F05h	Repeat the test. Replace the LS-120 drive.
0F06h	Insert a different disk in the LS-120 drive and repeat the test. Check the connectors on the LS-120 drive and motherboard. Replace the LS-120 drive.
0F07h	Replace the LS-120 drive.
0F08h	Insert a different disk in the LS-120 drive and repeat the test. Check the connectors on the LS-120 drive and motherboard. Replace the LS-120 drive.
0F09h	Replace the LS-120 drive.
TI CardBus Tests	
1201h	Remove any attached ISA or 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 computer. Replace the motherboard.

Code	Suggestions
USB Tests	
1301h	Reprogram the BIOS IC. Replace the power supply PCA. Replace the motherboard.
1302h – 1316h	Replace the motherboard.
9006h	(See USB Port Test below.)
DVD Tests	
1900h – 1902h	Insert a different DVD in the drive and repeat the test. Replace the DVD drive.
LAN/Modem Tests (3Com modem ONLY)	
8000h	Note: the test checks only the internal hardware up to the mini-PCI card, and does not check the mini-PCI panel or any external cabling. Repeat the test with the LAN cable/phone line unplugged. Replace the cable/phone line. Check the connections. Replace the mini-PCI card. Replace the mini-PCI panel. Replace the motherboard.
Fan Tests	
9001h	If the fan is already running, you will not hear a change. Check the fan connection. Replace the heatsink. Replace the motherboard.
9002h	Reset the computer. Replace the motherboard.
USB Port Test	
9006h	Make sure a USB device is connected to the port you are testing. 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 computer. Replace the motherboard.
9007h – 9008h	Reset the computer. Run BIOS Setup and restore default settings. Replace the power supply PCA.
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, 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. Replace the motherboard.
900Ch	Repeat the test. Make sure the IR ports on the reflector and test computers are lined up. Restart the reflector unit. Replace the motherboard.
Dock Tests	
9071h, 9073h	Update BIOS in computer. Replace electronics PCA in dock.
9075h – 907Ah	Replace electronics PCA in dock.
907Bh	Replace LED/button assembly in dock.
9082h	Rerun test with known good computer. Replace electronics PCA in dock.
9088h	Replace electronics PCA in dock.
Hard Disk Tests	
9602h	Failure may occur soon. Back up data and replace the hard disk.

Code	Suggestions
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. Reformat the hard disk. If necessary, recreate the Hibernate partition, then run FDISK to partition the hard disk.
9605h	Run full HDD test, For a computer 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, reformat the hard disk. If necessary, recreate the Hibernate partition, then run FDISK to partition the hard disk.

Code	Suggestions
9606h	Run the full HDD test. Reformat the hard disk. If necessary, recreate the Hibernate partition, then run FDISK to partition the hard disk.
9607h	Back up data, then reformat the hard disk. Replace the hard disk.

Power-On Self-Test

Note

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

The POST (Power-On Self-Test) is a series of initialization routines and diagnostic tests that the system BIOS runs when the computer 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. First, confirm the failure by performing a “clean” boot:

- Remove all accessories, including SDRAM modules, floppy drive, port replicator, PC Cards, printer, external monitor, pointing device, and keyboard.
- Provide “clean” ac power—no auto adapter or unusual ac adapter configuration.
- Press the system-off switch to start the computer from a known state.

If the computer fails to boot with a clean boot, it requires repair. 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.

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 8742 Keyboard Controller (part of power supply PCA).
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 display DIP switches, replace display interface PCA) or external ROM checksum failure.
1 long-5 short	Display DIP switches and EEPROM settings do not match (check DIP switch settings, reprogram EEPROM).
* 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 computer, enter BIOS Setup, and install the defaults or correct the error.

Table 3-5. POST Messages

Message	Description
0200 Failure Fixed Disk	Fixed disk is not working or not configured properly. Make sure the fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.
0210 Stuck key	Stuck key on keyboard.
0211 Keyboard error	Keyboard not working.
0212 Keyboard Controller Failed	Keyboard controller failed test. May require replacing power supply PCA (contains keyboard controller).
0213 Keyboard locked – Unlock key switch	Unlock the system to proceed.
0220 Monitor type does not match CMOS – Run SETUP	Monitor type not correctly identified in Setup
0230 Shadow RAM Failed at offset: <i>nnnn</i>	Shadow RAM failed at offset <i>nnnn</i> of the 64k block at which the error was detected.
0231 System RAM Failed at offset: <i>nnnn</i>	System RAM failed at offset <i>nnnn</i> of in the 64k block at which the error was detected.
0232 Extended RAM Failed at offset: <i>nnnn</i>	Extended memory not working or not configured properly at offset <i>nnnn</i> . Update to the latest BIOS version.
0250 System battery is dead – Replace and run SETUP	The CMOS clock battery indicator shows the battery is dead. Connect the ac adapter for at least 24 hours; replace the motherboard.
0251 System CMOS checksum bad – Default configuration used	System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter 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. Requires replacement of motherboard.
0270 Real time clock error	Real-time clock fails BIOS test. May require replacement of motherboard.
0280 Previous boot incomplete – Default configuration used	Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they 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	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 defined with the proper diskette type in Setup and that the diskette drive is attached correctly.
02B2 Incorrect Drive A type – run SETUP	Type of floppy drive A: not correctly identified in Setup.
02B3 Incorrect Drive B type – run SETUP	Type of floppy drive B: not correctly identified in Setup.
02D0 System cache error – Cache disabled	RAM cache failed and BIOS disabled the cache. May require replacement of motherboard. 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.

Message	Description
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).
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	Run ISA or EISA Configuration Utility to resolve resource conflict for the specified device.
CD ROM Drive	CD ROM Drive identified.
Entering SETUP ...	Starting Setup program
Failing Bits: nnnn	The hex number nnnn is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.
Fixed Disk n	Fixed disk <i>n</i> (0–3) identified.
Invalid System Configuration Data	Problem with NVRAM (CMOS) data.
I/O device IRQ conflict	I/O device IRQ conflict error.
PS/2 Mouse Boot Summary Screen:	PS/2 Mouse installed.
nnnn kB Extended RAM Passed	Where <i>nnnn</i> is the amount of RAM in kilobytes successfully tested.
nnnn Cache SRAM Passed	Where <i>nnnn</i> is the amount of system cache in kilobytes successfully tested.
nnnn kB Shadow RAM Passed	Where <i>nnnn</i> is the amount of shadow RAM in kilobytes successfully tested.
nnnn kB System RAM Passed	Where <i>nnnn</i> is the amount of system RAM in kilobytes successfully tested.
Operating system not found	Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.
Parity Check 1 nnnn	Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????. Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.
Parity Check 2 nnnn	Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays ????.
Press <F1> to resume, <F2> to Setup, <F3> for previous	Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter 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:	PS/2 mouse identified.
System BIOS shadowed	System BIOS copied to shadow RAM.
UMB upper limit segment address: nnnn	Displays the address <i>nnnn</i> of the upper limit of Upper Memory Blocks, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.
Video BIOS shadowed	Video BIOS copied to shadow RAM.

Sycard PCCtest 450 CardBus Card (Optional)

The PCCtest 450 CardBus Card (version 1.05) available from Sycard Technology is the only recommended diagnostic tool that tests the functionality of the PCMCIA slots using a PCMCIA card. It is a Type II CardBus 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 450 product contains these components:

- PCCtest 450 CardBus Card, version 1.05.
- PCCtest 450 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 provides 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)
OmniBook 6000 (PCI1420)	Upper	PCT450 -1 -v -b75	TESTCB -1 -v -b75 -jsD000:0
	Lower	PCT450 -0 -v -b75	TESTCB -0 -v -b75 -jsD000:0

Desktop Management Interface (DMI)

The Desktop Management Interface (DMI) is basically a set of rules for accessing information about a personal computer. Using DMI, an application program can determine, for example, which hardware and software components are present in a personal computer, the operating system being used, and the number of accessory board slots available. Using the DMI interface, a local or remote application program can check which hardware and software components are installed on your computer, and may be able to tell how well they are working or whether any needs replacing. All this information is stored in a special Management Information Format (MIF) file, installed on each personal computer as part of the DMI package.

Installing the DMI Package

The DMI package is included with the OmniBook, but must be properly installed before it can be used. Install the package as follows:.

To install the DMI preloaded on the hard disk:

1. Start Windows, if it is not already running.
2. Click Start, Programs, HP TopTools for Notebooks, Setup.

To install the DMI from the OmniBook *Recovery CD* or from floppy disks:

1. If you do not have a CD-ROM drive, create installation floppy disks by either of these methods:
 - Copy the DMI software from the \dmi directory of the *Recovery CD* (under \hp\Drivers) to two or more floppy disks (for example, copy the contents of the \disk1 subdirectory to disk #1).
 - If you have Web access, download the TopTools package from the HP Notebook Web site (see page vi), then create the floppy disks as directed.
2. Start Windows, if it is not already running.
3. Insert the *Recovery CD* into the CD-ROM drive, or insert disk #1 into the floppy drive.
4. Select and run the SETUP program from the dmi\disk1 directory on the CD (under \hp\Drivers), or from floppy disk #1.

Contents of the DMI Package

The DMI software and associated documentation is supplied either preinstalled on the OmniBook's hard disk drive or on the *Recovery CD*. The contents of the package are the same in both cases.

Since the information accessed by the DMI software is specific to a particular computer, it must be installed on each computer separately. The DMI package included with the OmniBook can be used only with the OmniBook.

The following software is supplied with the DMI package:

- A Microsoft Windows utility (SETUP.EXE) to install and initialize the DMI software.
- A Windows utility, HP TopTools. After DMI is installed, this utility can be used to display information about the computer through the DMI.
- A Management Information Format (MIF) file. This file contains information about everything on the computer that can be controlled using DMI facilities, and is initialized during installation.
- A component code, identifying the version of MIF file to use for specific models of HP OmniBook computers.
- Windows-compatible DMTF Service Layer software, which controls access to the DMI.
- A client agent. The HP Remote DMI Agent is a DMI application and also a network server-side stream-based application. The Remote Agent is listening for Remote Application connection requests. If the main window of the Remote Agent is hidden, then no icon will appear on the screen when it is running.

Using the DMI Interface

For a complete explanation of how to take full advantage of DMI, see the following documentation (provided with the OmniBook):

- A README.TXT file.
- A Windows online help file describing Hewlett-Packard's implementation of DMI (group and attribute definitions). Since not all models support all of Hewlett-Packard enhanced features, this document also describes any restrictions that apply.

Description of DMI

The Desktop Management Interface (DMI) is the result of the efforts of the Desktop Management Task Force (DMTF) founded in 1992 by a group of leading computer manufacturers—including Hewlett-Packard—to define a standard method of managing the physical and logical components of personal computers.

Hewlett-Packard has developed a number of extensions to DMI to allow it to manage the enhanced features of HP OmniBook computers, including passwords and tattooing (identifying a computer using a unique string of characters).

For full details of the structure of the MIF file (including an explanation of the fields of groups and attributes, and how to write an application program that accesses this information), access the DMTF FTP server <ftp.dmtf.org> or the DMTF web pages at the <http://www.dmtf.org>.

Uninstalling the DMI Package

1. Click Start, Programs, HP TopTools for Notebooks, Uninstall DMI.
2. Reboot the computer.

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

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

Table 3-7. BIOS Setup Menus and Parameters

OmniBook 6000: Introduced with BIOS version 1.00 (Spring 2000).		
Main Menu		Default
BIOS Revision	Shows the current BIOS version.	Detected automatically.
System Time	Sets the time using 24-hour format. Values set take effect immediately.	
System Date	Sets the date using mm/dd/yy (English) or dd/mm/yy format.	
Floppy Drive	Sets the floppy drive type.	Detected and set automatically.
Internal Hard Disk	Sets the hard disk drive type and various parameters.	Detected and set automatically.
Quiet Boot	When enabled, hides summary of power-on self-test and messages during boot.	Enabled
Video Display Device	Sets whether the built-in display automatically switches to an external display, if one is detected.	Auto
Video Expansion	When enabled, the video image covers the entire display in lower resolution modes. When disabled, the video image is centered in the display.	Disabled
Primary Video Adapter	Sets whether the computer automatically switches to an external video adapter connected to the docking system, if one is detected.	Auto
System Memory	Shows the system memory size.	640 KB
Extended Memory	Shows the extended memory size.	Detected automatically.
CPU Serial Number	For a processor with a serial number, makes that number available to software.	Disabled

System Devices Menu		Default
PS/2 Pointing Devices	Disables the internal pointing devices when an external PS/2 mouse is connected.	Auto
External Fn Key	Sets whether left CTRL+left ALT on an external keyboard is interpreted as the Fn key.	Enabled
IDE Controller	Enables the primary (hard drive) and secondary (module bay device) controllers.	Both
FDD Controller	Enables the floppy drive.	Enabled
Serial Port	Sets whether the serial port is active, and whether it is configured automatically or by the user.	Enabled
Base I/O address	Sets the I/O address and interrupt.	3F8h, IRQ4
IrDA Port	Sets whether the infrared port is active, and whether it is configured automatically or by the user.	Disabled
Mode	Sets the hardware to support FIR (Fast IR) or SIR (Standard IR) infrared communications. (Driver installation required for Windows 95.)	FIR
Base I/O address	Sets the I/O address and interrupt.	2F8h, IRQ3
DMA channel	Sets the DMA channel for Fast IR (FIR) mode.	DMA0
Parallel Port	Sets whether the parallel port is configured by the user or the BIOS or OS (automatically), or not at all.	Enabled
Mode	Sets the port to output only, bi-directional, EPP, or ECP.	ECP
Base I/O address	Sets the I/O address.	378h
Interrupt	Sets the interrupt.	IRQ7
DMA channel	Sets the DMA channel for ECP mode.	DMA3
Security Menu		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	Press ENTER to set, change, or clear the user password. The password can have no more than 8 characters (0–9, A–Z), and cannot include special or accented characters.	Enter
Set Administrator Password	Press ENTER to set, change, or clear the administrator password, which protects BIOS Setup settings. The password can have no more than 8 characters (0–9, A–Z), and cannot include special or accented characters.	Enter
Boot	Sets whether a user password is required when the computer boots. Requires the administrator password for changes.	Enabled
Resume*	Sets whether a user password is required when resuming from Standby or Hibernate mode. Requires the administrator password for changes. (Windows 95 and 98 only.)	Enabled
Undock*	Sets whether a user password is required when undocking the computer. Requires the administrator password for changes. (Windows 95 and 98 only.)	Disabled
Internal hard disk drive lock*	Encodes the current user password (or administrator password if that is the only password set) on the hard disk drive.	Disabled
Removable Device Boot	Sets whether the computer will attempt to boot from a floppy drive or other removable device.	Enabled
* Resume, Undock, and Internal hard disk drive lock options are available only if the Boot option is enabled.		

Power Menu		Default
Windows 2000 uses only the settings marked with *. Windows 98 uses only the settings marked with * or **. All other settings in the Power menu are ignored.		
Intel SpeedStep Mode*	Sets the speed used by a dual-speed processor at boot, depending on the available power source. A separate Control Panel power setting controls speed changes after boot.	Automatic
Power Management Mode	Disables time-outs, selects a combination of time-outs, or allows customized time-outs.	Max. Power Savings
Smart CPU Mode	Enables automatic CPU power savings when running on battery power. Absence of keyboard, mouse, and hard disk activity could cause slower CPU response.	On
Display-off Time-out	Sets the period of inactivity after which the computer enters Display-off power mode.	2 minutes
Suspend Time-out	Sets the period of inactivity after which the computer goes from Display-off to Standby power mode. (Skips Display-off mode if that time-out is disabled.)	4 minutes
Hibernate Time-out**	Sets whether the computer goes from Standby to Hibernate power mode after the indicated period of inactivity. (Skips Standby mode if the suspend time-out is disabled.)	4 hours
Hard Disk Time-out	Sets the period of hard disk inactivity after which the internal hard disk (and any hard disk drive in the plug-in module bay) stops spinning.	2 minutes
Time-out on AC	Sets whether power management time-outs occur while the ac adapter is connected.	Disabled
Lid Switch Mode	Sets the action that occurs if the computer's lid is closed.	Turn off LCD
Resume On Serial Ring	Sets whether the system resumes if it received a ring signal.	Enabled
Resume On Time of Day	Sets whether the system resumes at a defined time of day.	Disabled
Resume Time	Sets the 24-hour time when the system resumes from if Resume On Time of Day is enabled.	
Auto Suspend on Undock*	Sets whether the computer suspends to Standby power mode after undocking.	When Lid Closed
Auto Turn-On on Dock*	Sets whether the computer turns on after docking.	Enabled
* Windows 98 and 2000 use these settings. ** Windows 98 uses this additional setting.		
Boot Menu		Default
+Removable Device +Hard Disk CD-ROM/DVD Drive MBA UNDI	Shows the order of boot devices, with "+" indicating a device category. Move the entries to change the order. If the computer has more than one device in a category, you can select the one scanned. MBA UNDI (Managed Boot Agent) appears in the list only if a built-in LAN is present—it provides diskless boot from a network server.	1. Removable Device 2. Hard Disk 3. CD-ROM/DVD drive 4. MBA UNDI
Exit Menu		
Save Changes and Exit	Saves Setup changes, then exits and reboots.	
Discard Changes and Exit	Discards any Setup changes made since last save, then exits and reboots. Does not affect password, date, or time changes.	
Get Default Values	Restores default settings, and remains in Setup. Does not affect password, date, or time changes.	
Load Previous Values	Discards any Setup changes made since last save, and remains in Setup. Does not affect password, date, or time changes.	
Save Changes	Saves Setup changes, and remains in Setup. Security settings are saved when changed.	

Replaceable Parts

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

- OmniBook replaceable parts (page 4-3).
- Accessory replacement parts (page 4-5).
- Part number reference (page 4-6).

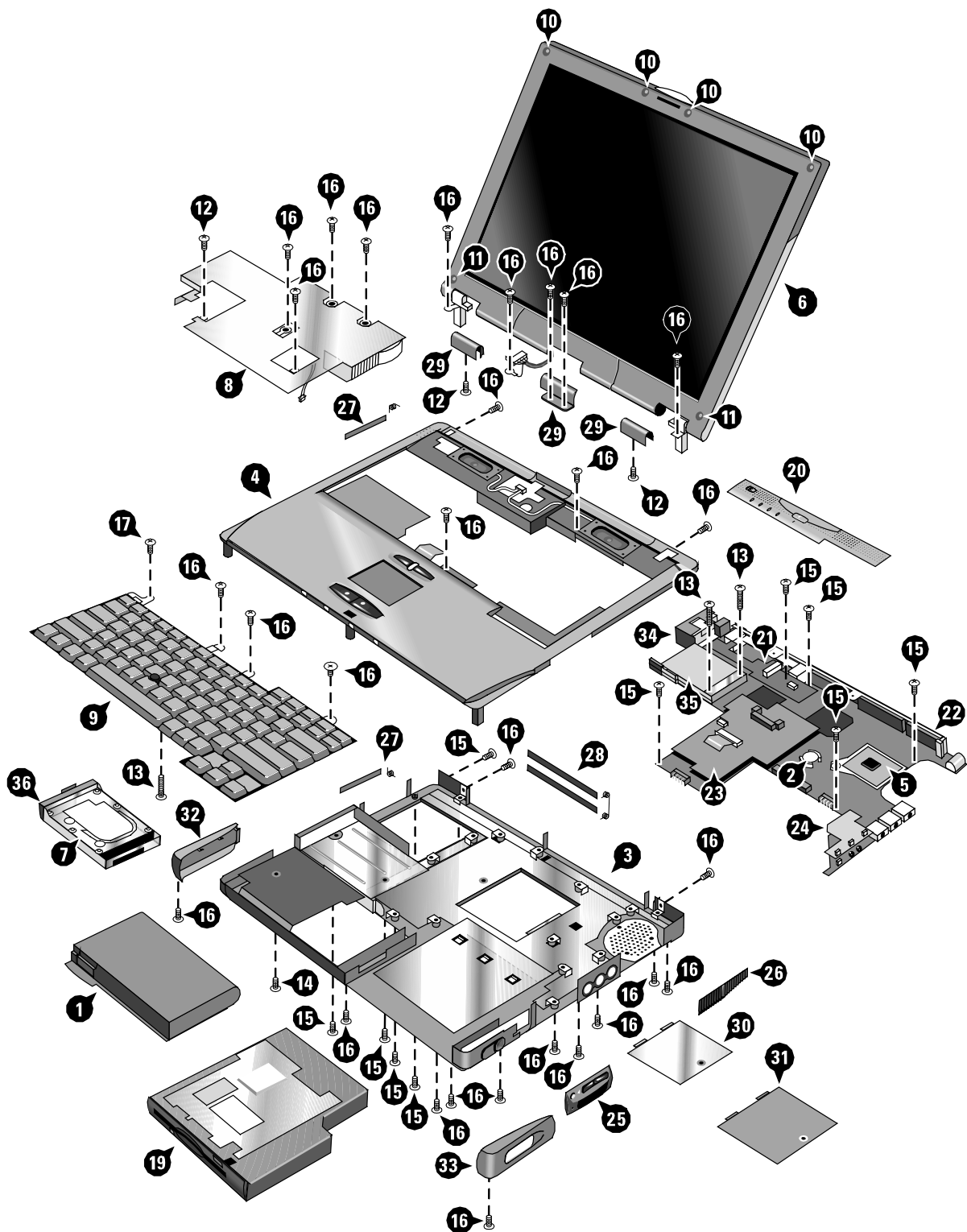


Figure 4-1. Exploded View

Table 4-1. OmniBook Replaceable Parts

	Description	Part Number	Exchange Part Number	User-Repl.
1	Battery, main (14.8 V)	F2072-60906		Yes
2	Battery, CMOS (rechargeable 3 V)	Maxell ML1220 or equivalent		
	Card, mini-PCI (LAN/modem, 3Com)	F2072-60902		Yes
	Card, mini-PCI (SW modem, Ambit)	F2072-60903		Yes
3	Case, bottom	F2072-60916		
4	Case, top	F2072-60905		
5	CPU module, 600/500 MHz, Pentium III	1821-5688	F1979-69101	
5	CPU module, 650/500 MHz, Pentium III	1821-5689	F1980-69101	
5	CPU module, 700/600 MHz, Pentium III	1821-5690	F2072-69102	
5	CPU module, 550 MHz, Celeron	1821-5865	F2072-69101	
6	Display assembly, 14.1"	F2072-60917	F2072-60917	
6	Display assembly, 15.0"	F2072-60918	F2072-60918	
7	Drive, hard disk (5 GB, 9.5 mm, Hitachi)	0950-3825	F2072-69103	Yes
7	Drive, hard disk (6 GB, 9.5 mm, Hitachi)	0950-3732	F1660-69108	Yes
7	Drive, hard disk (6 GB, 9.5 mm, IBM)	0950-3710	F1711-69106	Yes
7	Drive, hard disk (10 GB, 9.5 mm, IBM)	0950-3831	F2072-69104	Yes
7	Drive, hard disk (12 GB, 9.5 mm, Hitachi)	0950-3733	F1660-69107	Yes
7	Drive, hard disk (18 GB, 12.7 mm, IBM)	0950-3712	F1660-69106	Yes
8	Heatsink (with fan)	F2072-60908		
9	Keyboard, Arabic English	F2072-60949		
9	Keyboard, Belgian	F2072-60944		
9	Keyboard, Czech	F2072-60943		
9	Keyboard, Danish	F2072-60941		
9	Keyboard, French	F2072-60936		
9	Keyboard, French Canadian	F2072-60933		
9	Keyboard, German	F2072-60934		
9	Keyboard, Greek	F2072-60930		
9	Keyboard, Hebrew	F2072-60945		
9	Keyboard, Hungarian	F2072-60946		
9	Keyboard, International English	F2072-60929		
9	Keyboard, Italian	F2072-60942		
9	Keyboard, Japanese	F2072-60937		
9	Keyboard, Norwegian	F2072-60938		
9	Keyboard, Portuguese	F2072-60948		
9	Keyboard, Russian	F2072-60947		
9	Keyboard, Spanish	F2072-60935		
9	Keyboard, Swedish/Finnish	F2072-60940		
9	Keyboard, Swiss	F2072-60939		
9	Keyboard, Traditional Chinese	F2072-60950		
9	Keyboard, Turkish	F2072-60931		
9	Keyboard, UK English	F2072-60932		
9	Keyboard, US English	F2072-60928		
	Kit, OB6000 feet/bumpers	F2072-60926		Yes
10	Bumpers, display (16 in kit)	(see above kit)		Yes
11	Covers, display screw (16 in kit)	(see above kit)		Yes
	Feet, rubber (16 in kit)	(see above kit)		Yes

	Description	Part Number	Exchange Part Number	User-Repl.
	Kit, OB6000 screws	F2072-60923		Yes
12	Screw, M2x4mm	(see above kit)		
13	Screw, M2x15mm	(see above kit)		
14	Screw, M2.5x2mm (wide-head)	(see above kit)		
15	Screw, M2.5x4mm	(see above kit)		
16	Screw, M2.5x6mm	(see above kit)		
17	Screw, M2.5x8mm	(see above kit)		
18	Screw, M3x2mm	(see above kit)		
	Label, MS Product ID (W95)	F2072-60983		
	Label, MS Product ID (W98)	F2072-60984		
	Label, MS Product ID (W2K)	F2072-60985		
19	Module, plug-in (floppy disk drive shown)	F2072-60922		Yes
	Overlay, serial label	F2072-60920		
20	Panel, power button	F2072-60907		Yes
21	PCA, display interface	F2072-60915		
22	PCA, motherboard (Celeron)	F2072-60914	F2072-69014	
22	PCA, motherboard (Pentium)	F2072-60913	F2072-69013	
23	PCA, power supply	F2072-60911		
24	PCA, volume	F2072-60912		
	SDRAM module, 32 MB, SODIMM (100 MHz)	1818-7950		Yes
	SDRAM module, 64 MB, SODIMM (100 MHz)	1818-7951	F1660-69103	Yes
	SDRAM module, 128 MB, SODIMM (100 MHz)	1818-7952	F1660-69104	Yes
	SDRAM module, 256 MB, SODIMM (100 MHz)	1818-7953	F1654-69101	Yes
	Set, covers (service)	F2072-60924		
25	Panel, sound/IR	(see above kit)		
26	Panel, vent	(see above kit)		
27	Doors, PCMCIA (with springs)	(see above kit)		
28	Doors, docking (with springs)	(see above kit)		
29	Covers, hinge	(see above kit)		
	Set, covers (user)	F2072-60927		Yes
30	Cover, mini-PCI	(see above kit)		Yes
31	Cover, SDRAM	(see above kit)		Yes
32	Cover, left corner	(see above kit)		Yes
33	Cover, right corner	(see above kit)		Yes
	Set, mini-PCI panels	F2072-60925		
34	Panel, mini-PCI (LAN/modem, 3Com)	(see above kit)		
34	Panel, mini-PCI (SW modem, Ambit)	(see above kit)		
34	Panel, mini-PCI (blank)	(see above kit)		
35	Socket, PCMCIA	F2072-60919		
	Tray, business card	F2072-60921		Yes
36	Tray, hard disk drive	F2072-60909		Yes

Table 4-2. Accessory Replaceable Parts

Description	Part Number	Exchange Part Number	User Repl.
Adapter, ac (60 watt)	0950-3634		Yes
Adapter, auto/air (75 watt)	F1455-80003		Yes
Adapter, docking module bay	F2010-60901		Yes
Adapter, PS/2 "Y"	F1469-80001		Yes
Battery, main (14.8 V)	F2072-60906		Yes
Battery, secondary module	F2014-60901		Yes
Cable, floppy disk drive (external)	F2008-60901		Yes
Charger, battery (external)	F2011-60901		Yes
Drive housing, second hard disk drive	F2072-60910		Yes
Drive, CD-ROM module	F2017-60901		Yes
Drive, CD-RW module	F2026-60901	F2026-69001	Yes
Drive, DVD module	F2015-60901		Yes
Drive, floppy disk module	F2013-60901		Yes
Drive, LS-120 module	F2022-60901		Yes
Drive, Zip module	F2009-60901		Yes
Mini dock	F1452-60901		Yes
Module, weight saving	F2072-60922		Yes
Monitor stand (short)	F1453-60901		Yes
Monitor stand (tall)	F1477-60936		Yes
Plug, adapter, auto/air	5182-5131		Yes
Port replicator	F1451-60901		Yes
SDRAM module, 32 MB, SODIMM (100 MHz)	1818-7950		Yes
SDRAM module, 64 MB, SODIMM (100 MHz)	1818-7951	F1660-69103	Yes
SDRAM module, 128 MB, SODIMM (100 MHz)	1818-7952	F1660-69104	Yes
SDRAM module, 256 MB, SODIMM (100 MHz)	1818-7953	F1654-69101	Yes
Tray, docking E	F2012-60901		Yes

Table 4-3. Part Number Reference

Part Number	Exchange Part Number	Description	User Repl.
0950-3634		Adapter, ac (60 watt)	Yes
0950-3710	F1711-69106	Drive, hard disk (6 GB, 9.5 mm, IBM)	Yes
0950-3712	F1660-69106	Drive, hard disk (18 GB, 12.7 mm, IBM)	Yes
0950-3732	F1660-69108	Drive, hard disk (6 GB, 9.5 mm, Hitachi)	Yes
0950-3733	F1660-69107	Drive, hard disk (12 GB, 9.5 mm, Hitachi)	Yes
0950-3825	F2072-69103	Drive, hard disk (5 GB, 9.5 mm, Hitachi)	Yes
0950-3831	F2072-69104	Drive, hard disk (10 GB, 9.5 mm, IBM)	Yes
1818-7950		SDRAM module, 32 MB, SODIMM (100 MHz)	Yes
1818-7951	F1660-69103	SDRAM module, 64 MB, SODIMM (100 MHz)	Yes
1818-7952	F1660-69104	SDRAM module, 128 MB, SODIMM (100 MHz)	Yes
1818-7953	F1654-69101	SDRAM module, 256 MB, SODIMM (100 MHz)	Yes
1821-5688	F1979-69101	CPU module, 600/500 MHz, Pentium III	
1821-5689	F1980-69101	CPU module, 650/500 MHz, Pentium III	
1821-5690	F2072-69102	CPU module, 700/600 MHz, Pentium III	
1821-5865	F2072-69101	CPU module, 550 MHz, Celeron	
5182-5131		Plug, adapter, auto/air	Yes
8120-6312		Cord, power, Australia #ABG (2w)	Yes
8120-6313		Cord, power, US #ABA (2w)	Yes
8120-6314		Cord, power, Europe #ABB (2w)	Yes
8120-6316		Cord, power, Japan #ABJ (2w)	Yes
8120-6317		Cord, power, S. Africa #ACQ (2w)	Yes
8120-8367		Cord, power, Argentina (2w)	Yes
8120-8373		Cord, power, China #AB2 (2w)	Yes
8120-8452		Cord, power, Chile (2w)	Yes
8120-8699		Cord, power, UK (EPSR) for Hong Kong (2w)	Yes
F1320-60971		Cap, pointing stick (bag of 5)	Yes
F1451-60901		Port replicator	Yes
F1452-60901		Mini dock	Yes
F1453-60901		Monitor stand (short)	Yes
F1455-80003		Adapter, auto/air (75 watt)	Yes
F1469-80001		Adapter, PS/2 "Y"	Yes
F1477-60936		Monitor stand (tall)	Yes
F2008-60901		Cable, floppy disk drive (external)	Yes
F2009-60901		Drive, Zip module	Yes
F2010-60901		Adapter, docking module bay	Yes
F2011-60901		Charger, battery (external)	Yes
F2012-60901		Tray, docking E	Yes
F2013-60901		Drive, floppy disk module	Yes
F2014-60901		Battery, secondary module	Yes
F2015-60901		Drive, DVD module	Yes
F2017-60901		Drive, CD-ROM module	Yes
F2022-60901		Drive, LS-120 module	Yes
F2026-60901	F2026-69001	Drive, CD-RW module	Yes
F2072-60902		Card, mini-PCI (LAN/modem, 3Com)	Yes
F2072-60903		Card, mini-PCI (SW modem, Ambit)	Yes

Part Number	Exchange Part Number	Description	User Repl.
F2072-60905		Case, top	
F2072-60906		Battery, main (14.8 V)	Yes
F2072-60907		Panel, power button	Yes
F2072-60908		Heatsink (with fan)	
F2072-60909		Tray, hard disk drive	Yes
F2072-60910		Drive housing, second hard disk drive	Yes
F2072-60911		PCA, power supply	
F2072-60912		PCA, volume	
F2072-60913	F2072-69013	PCA, motherboard (Pentium)	
F2072-60914	F2072-69014	PCA, motherboard (Celeron)	
F2072-60915		PCA, display interface	
F2072-60916		Case, bottom	
F2072-60917	F2072-69017	Display assembly, 14.1"	
F2072-60918	F2072-69018	Display assembly, 15.0"	
F2072-60919		Socket, PCMCIA	
F2072-60920		Overlay, serial label	
F2072-60921		Tray, business card	Yes
F2072-60922		Module, weight saving	Yes
F2072-60923		Kit, OB6000 screws	Yes
F2072-60924		Set, covers (service)	
F2072-60925		Set, mini-PCI panels	
F2072-60926		Kit, OB6000 feet/bumpers	Yes
F2072-60927		Set, covers (user)	Yes
F2072-60928		Keyboard, US English	
F2072-60929		Keyboard, International English	
F2072-60930		Keyboard, Greek	
F2072-60931		Keyboard, Turkish	
F2072-60932		Keyboard, UK English	
F2072-60933		Keyboard, French Canadian	
F2072-60934		Keyboard, German	
F2072-60935		Keyboard, Spanish	
F2072-60936		Keyboard, French	
F2072-60937		Keyboard, Japanese	
F2072-60938		Keyboard, Norwegian	
F2072-60939		Keyboard, Swiss	
F2072-60940		Keyboard, Swedish/Finnish	
F2072-60941		Keyboard, Danish	
F2072-60942		Keyboard, Italian	
F2072-60943		Keyboard, Czech	
F2072-60944		Keyboard, Belgian	
F2072-60945		Keyboard, Hebrew	
F2072-60946		Keyboard, Hungarian	
F2072-60947		Keyboard, Russian	
F2072-60948		Keyboard, Portuguese	
F2072-60949		Keyboard, Arabic English	
F2072-60950		Keyboard, Traditional Chinese	
F2072-60951		Recovery CD, Simplified Chinese W95	

Part Number	Exchange Part Number	Description	User Repl.
F2072-60952		Recovery CD, Greek W98	
F2072-60953		Recovery CD, Turkish W98	
F2072-60954		Recovery CD, English W95	
F2072-60955		Recovery CD, German W95	
F2072-60956		Recovery CD, Spanish W95	
F2072-60957		Recovery CD, French W95	
F2072-60958		Recovery CD, Dutch W95	
F2072-60959		Recovery CD, Japanese W95	
F2072-60960		Recovery CD, Norwegian W95	
F2072-60961		Recovery CD, Swedish W95	
F2072-60962		Recovery CD, Hebrew W98	
F2072-60963		Recovery CD, Finnish W95	
F2072-60964		Recovery CD, Danish W95	
F2072-60965		Recovery CD, Italian W95	
F2072-60966		Recovery CD, Czech W98	
F2072-60967		Recovery CD, Hungarian W98	
F2072-60968		Recovery CD, Polish W98	
F2072-60969		Recovery CD, Russian W98	
F2072-60970		Recovery CD, Arabic W98	
F2072-60971		Recovery CD, Traditional Chinese W98	
F2072-60972		Recovery CD, English W2K	
F2072-60973		Recovery CD, German W2K	
F2072-60974		Recovery CD, Spanish W2K	
F2072-60975		Recovery CD, French W2K	
F2072-60976		Recovery CD, Dutch W2K	
F2072-60977		Recovery CD, Japanese W2K	
F2072-60978		Recovery CD, Norwegian W2K	
F2072-60979		Recovery CD, Swedish W2K	
F2072-60980		Recovery CD, Finnish W2K	
F2072-60981		Recovery CD, Danish W2K	
F2072-60982		Recovery CD, Italian W2K	
F2072-60983		Label, MS Product ID (W95)	
F2072-60984		Label, MS Product ID (W98)	
F2072-60985		Label, MS Product ID (W2K)	

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 Technical Support to determine the proper removal procedure. The user must provide proof of ownership, and the OmniBook 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 OmniBook being “cleansed” is actually in the possession of the unit’s actual and current owner. This requires a sales receipt showing the unit serial number and owner’s name, or a written statement from the owner attesting that he or she is the owner of the unit. The statement can be a fax copy of the document. The fact that the unit 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 unit 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 unit.

Hewlett-Packard Display Quality Statement

TFT display manufacturing is a highly precise but imperfect technology, and manufacturers cannot produce large displays that are cosmetically perfect. Most, if not all, TFT displays exhibit some level of cosmetic imperfection. These cosmetic imperfections 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 OmniBook display.*

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

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

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

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

2. Use the table below to determine whether the display should be considered for replacement. These are the only conditions in this guideline that 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. Customers with cosmetic-based complaints that do not conform to the above conditions and tests will not normally be considered for display replacement. The HP-responsible person working with the customer should identify work-arounds that are reasonable and appropriate for the individual customer. Customers who must have a more perfect display solution should consider switching to an OmniBook with a DSTN display.

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

Table 5-1. OmniBook 6000 LCD Guidelines (14.1/15.0" TFT, XGA)

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)	• Any polarizer bubble, discoloration, or dent that is visible from at least 36 cm (14 in).
Definitions of imperfections: a Bright or dark dot: a subpixel (red, green, or blue dot) that is stuck on or off. b Polarizer dent or bubble: a light spot with a darker border that appears on a lighted display and does not change size. (In contrast, a polarizer scratch is a light line that is visible on a darker background and does not change size.)	

Service Notes

Service notes containing important repair information for the HP OmniBook 6000 will be issued periodically as needed. These notes are available online at the Partnership Web site—see page vi.

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