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HP Omnibook 500

Service Manual

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Edition History

Edition 2 .... June 2001

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Introduction

This manual provides reference information for use by HP-authorized service personnel in servicing and repairing the HP Omnibook 500.

The manual is designed as a self-paced guide that will train you to service, configure, and repair Omnibook 500 computers. The manual is self-contained, so you can follow it without having equipment available.

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

Source	Address or Number	Comments
HP Notebook Web Site	http://www.hp.com/notebooks (European mirror: http://www.europe.hp.com/notebooks)	
HP Partnership Web	http://partner.americas.hp.com	Restricted to Authorized Resellers only.
HP Asia Pacific Channel Support Centre for DPSP Partners	http://www.hp.com.au	Restricted to DPSP Partners only.
HP/MCD Web Site	http://www.mcd.hp.com	HP's internal web site for division information.
America Online	Keyword: HP	Call (800) 827-6364 for membership within the U.S.
CompuServe	GO HP	Call (800) 524-3388 for membership within the U.S.
HP Support Assist CD-ROM	(800) 457-1762	U.S. and Canada.
	(801) 431-1587	Outside U.S. and Canada.
Microsoft Windows manual		Information about Windows operating system.
Microsoft Web	http://www.microsoft.com	Information and updates for Windows operating systems.

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Product Information

The HP Omnibook 500 provides outstanding performance and expandability, in a conveniently portable form. Its high-performance components (including the multimedia expansion base) enable it to perform as a desktop computer or as a portable multimedia presentation tool.

Table 1-1. Omnibook 500 Series Models

Omnibook Product *	CPU **	Display	Hard Drive	Drives	Standard SDRAM	Communication
F2157x	Celeron 500 MHz	12.1" TFT XGA	7.5 GB	FDD	64 MB	None
F2158x	Celeron 500 MHz	12.1" TFT XGA	7.5 GB	FDD	64 MB	Modem
F2159x	Celeron 500 MHz	12.1" TFT XGA	7.5 GB	Expansion base, FDD, CD-ROM	64 MB	Modem
F2160x	Pentium III 600 MHz	12.1" TFT XGA	7.5 GB	FDD	64 MB	None
F2161x	Pentium III 600 MHz	12.1" TFT XGA	7.5 GB	FDD	64 MB	Modem
F2162x	Pentium III 600 MHz	12.1" TFT XGA	7.5 GB	Expansion base, FDD, CD-ROM	64 MB	Modem
F2163x	Pentium III 600 MHz	12.1" TFT XGA	10 GB	FDD	128 MB	None
F2164x	Pentium III 600 MHz	12.1" TFT XGA	10 GB	FDD	128 MB	Modem/LAN
F2165x	Pentium III 600 MHz	12.1" TFT XGA	10 GB	Expansion base, FDD, CD-ROM	128 MB	Modem/LAN
F2166x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	FDD	128 MB	None
F2167x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	FDD	128 MB	Modem/LAN
F2168x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	Expansion base, FDD, CD-ROM	128 MB	Modem/LAN
F3476x	Celeron 600 MHz	12.1" TFT XGA	10 GB	FDD	64 MB	None
F3477x	Celeron 600 MHz	12.1" TFT XGA	10 GB	FDD	64 MB	Modem/LAN
F3478x	Celeron 600 MHz	12.1" TFT XGA	10 GB	Expansion base, FDD, CD-ROM	64 MB	Modem/LAN
F3479x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	FDD	128 MB	None
F3480x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	FDD	128 MB	Modem/LAN
F3481x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	FDD	128 MB	Modem/LAN/ 802.11 wireless
F3482x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	Expansion base, FDD, CD-ROM	128 MB	Modem/LAN
F3483x	Pentium III 700 MHz	12.1" TFT XGA	20 GB	Expansion base, FDD, CD-ROM	128 MB	Modem/LAN/ 802.11 wireless
F3484x	Pentium III 750 MHz	12.1" TFT XGA	30 GB	FDD	256 MB	None
F3485x	Pentium III 750 MHz	12.1" TFT XGA	30 GB	FDD	256 MB	Modem/LAN
F3486x	Pentium III 750 MHz	12.1" TFT XGA	30 GB	FDD	256 MB	Modem/LAN/ 802.11 wireless
F3487x	Pentium III 750 MHz	12.1" TFT XGA	30 GB	Expansion base, FDD, CD-ROM	256 MB	Modem/LAN
F3488x	Pentium III 750 MHz	12.1" TFT XGA	30 GB	Expansion base, FDD, CD-ROM	256 MB	Modem/LAN/ 802.11 wireless

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 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 500	Omnibook 6000	Omnibook 900B
Processor*	Celeron (500 or 600 MHz) or Pentium III (600 to 750 MHz).	Celeron (550 to 650 MHz) or Pentium III (600 to 850 MHz).	Pentium III (450, 500, 600, or 650 MHz).
Memory	64, 128, or 256 MB SDRAM in system slot. Expandable to 512 MB.	64 or 128 MB SDRAM in system slot. Expandable to 512 MB.	64 MB SDRAM on motherboard. Expandable to 160 or 320 MB.
Display	12.1-inch TFT XGA display.	15.0- or 14.1-inch TFT XGA or 15.0-inch TFT SXGA+ 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 98 or Windows 2000 preinstalled.	Windows 95, Windows 98, or Windows 2000 preinstalled.	Windows 95, Windows 98, Windows NT, or Windows 2000 preinstalled.
HP Toptools	HP Toptools 5.0.	HP Toptools 4.5 to 5.0.	HP Toptools 3.0 to 5.0.
Power Management	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.	APM 1.2. ACPI compliant.
Power States	On, 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.
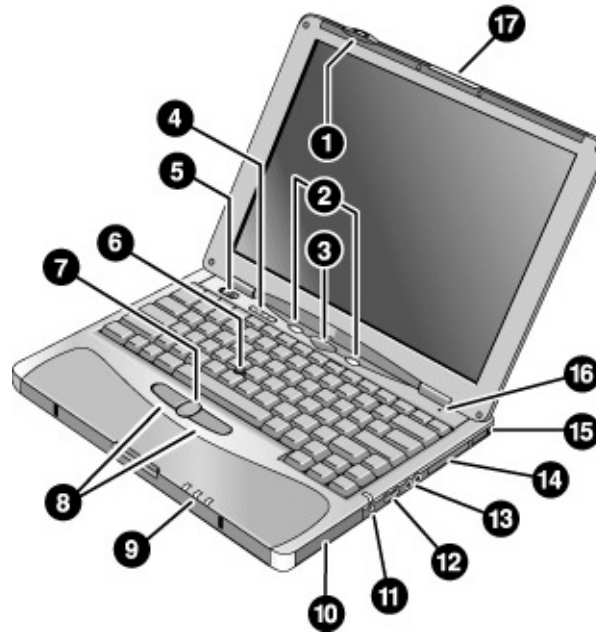
Figure 1-1. Omnibook — Front View

1. Wireless on-off button and indicator light (on certain models).

2. Left and right One-Touch buttons (programmable).

3. Sleep button. Suspends and resumes operation.

4. Keyboard status lights: Caps Lock, Num Lock, Keypad Lock, Scroll Lock.

5. Power slide button. Turns the computer on and off.

6. Pointing stick (pointing device).

7. Scroll button.

8. Left and right click buttons.

9. Main status lights: power mode, hard disk activity, main battery charge.

10. Hard disk drive.

11. Audio-off button and audio-off light.

12. Volume control.

13. Audio jacks: audio out (headphones), external microphone.

14. PC Card slot.

15. PC Card eject button.

16. Built-in microphone.

17. Latch for opening the computer.
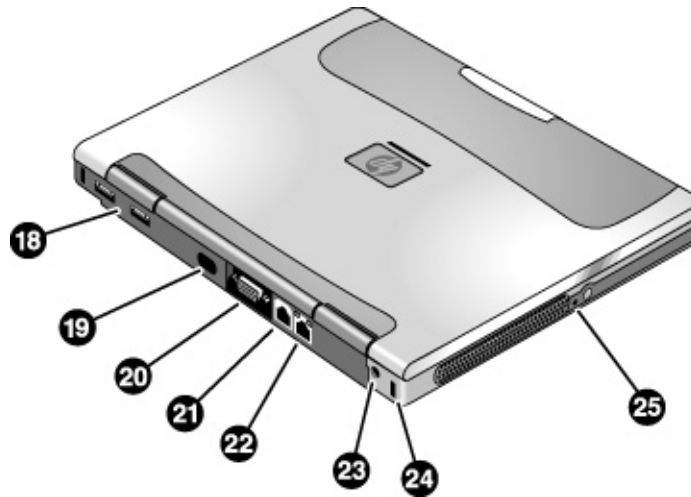
Figure 1-2. Omnibook — Back View

18. Universal serial bus ports (USB).

19. Infrared port (on certain models).

20. External monitor port.

21. Modem port (on certain models).

22. LAN port (on certain models).

23. AC adapter jack.

24. Kensington lock slot (security connector).

25. System-off switch.
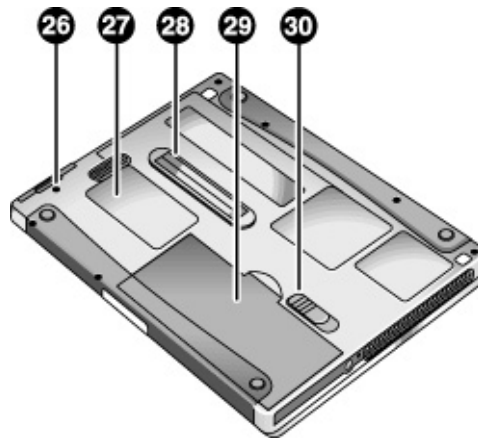
Figure 1-3. Omnibook — Bottom View

26. Hard disk drive retaining screw.

27. SDRAM cover.

28. Docking port.

29. Main battery.

30. Main battery latch.

The following two illustrations show the main external features of the expansion base.
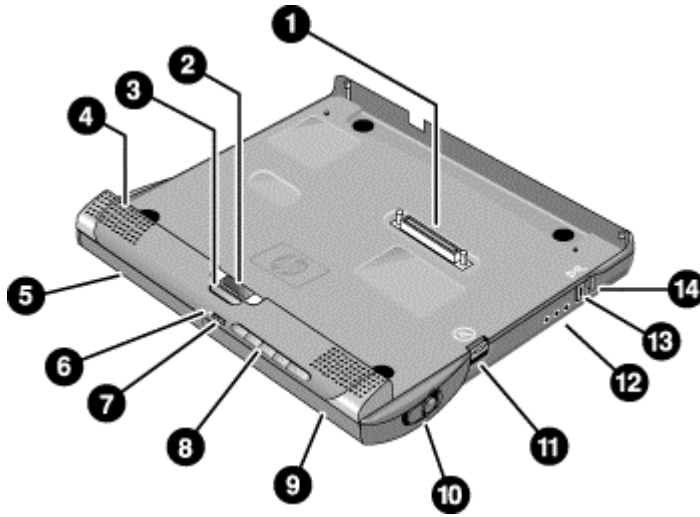
Figure 1-4. Expansion Base — Front View

1. Docking connector.
2. Status panel.
3. Status panel button.
4. Speaker (one on each side).
5. Left plug-in module bay. Can contain a CD-ROM or DVD drive, floppy disk drive, secondary battery, or other plug-in module.
6. CD status light.
7. CD player power button.

8. CD player controls: previous track, play/pause, stop, next track, volume.
9. Right plug-in module bay. Used with CD player controls.
10. Module eject latch (one on each side).
11. Undock switch.
12. Audio jacks: audio out (headphones), external microphone, audio line in.
13. Kensington lock slot (security connector).
14. Emergency undock latch.
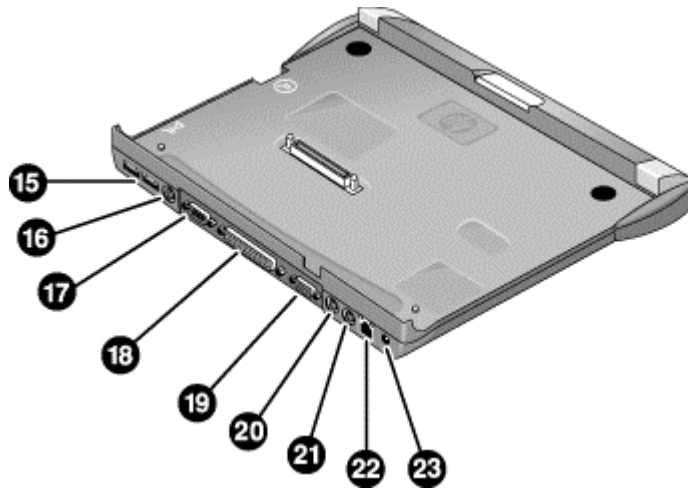
Figure 1-5. Expansion Base — Back View

15. Universal serial bus ports (USB).

16. S-video (TV out) port.

17. Serial port (COM1).

18. Parallel port (LPT1). Use this port for a parallel printer or other parallel device.

19. External monitor port.

20. PS/2 mouse port.

21. PS/2 keyboard port.

22. LAN port (works only if the computer has a built-in LAN port).

23. AC adapter jack.

Operation

This section gives an overview of the operation of the computer and expansion base.

Turning the Computer On and Off

You can start and stop the computer using its blue sleep button. However, at 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
On mode Power mode status light is green.	Press the blue sleep button.	
Standby mode Saves significant power. Turns off the display and other components. Maintains current session in SDRAM. Restarts quickly. Restores network connections. Power mode status light is amber.	Press blue sleep button –or– click Start, Shutdown, Standby –or– allow timeout.	Press the blue sleep button to display your current session.
Hibernate mode Saves maximum power. Saves current session to disk, then shuts down. Restores network connections. Power mode status light is off.	Press Fn+F12 –or– Click Start, Hibernate (Windows 98) –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. Power mode status light is off.	Click Start, Shut Down, Shut down (recommended) –or– slide the power button.	Press the blue sleep button to restart with a new session.

Checking the Status of the Computer

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

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

I/⏻ ⬙ ⚡	Meaning
■ ▯ ▯	**Power mode** On: the computer is on (even if the display is off). Blinking: the computer is in Standby mode. (Steady amber light on some models.) Off: computer is off or in Hibernate mode.
▯ ■ ▯	**Hard disk drive activity** Blue: the computer is accessing the hard disk drive.
▯ ▯ ■	**Main battery charge status** Green: the AC adapter is connected and the battery is fully charged. Amber: the AC adapter is connected and the battery is charging. Blinking. the AC adapter is connected and the battery is missing or has a fault. (Steady red light on some models.) Off: the AC adapter is not connected.

The keyboard status lights indicate the status of the keyboard locks.

Table 1-5. Keyboard Status Lights

	Meaning
A	**Caps Lock** Caps Lock is active.
1	**Num Lock** Num Lock is active (Fn+F9). (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 (Fn+F10).

Battery Status

Every main battery and secondary battery plug-in module has five lights on its back (connector) side that indicate its charge level. To view these lights, press the pad next to them. The number of lights that turn on indicates the battery's 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 PS/2 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.

External USB keyboards do not support Fn hot 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	Audio mute.
Fn+F8	Toggles the built-in keypad on and off. Does not affect an external keyboard. If Num Lock is on, then the numeric functions are active; otherwise, cursor control is active (as marked on an external keyboard).
Fn+F9	Toggles Num Lock on and off.
Fn+F10	Toggles Scroll Lock on and off.
Fn+F11	Pause.
Fn+F12	Enters Hibernate mode.
Fn+HOME	Prints screen.
Fn+UP ARROW*	Increases sound volume.
Fn+DOWN ARROW*	Decreases sound volume.
* Only if marked on the ARROW keys.	

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:

- If possible, shut down Windows: press CTRL+ALT+DEL, then click Shut Down. Press the blue sleep button to restart.

- Slide and hold the power button for four seconds, until the display shuts down, then press the blue sleep button to restart.

- Use a straightened paper clip to press the system-off switch on the left side of the computer. Press the blue sleep button to restart.

- Undock the computer if docked, unplug the AC adapter, remove the main battery, then insert a straightened paper clip into the computer's system-off switch. Press the blue sleep button to restart.
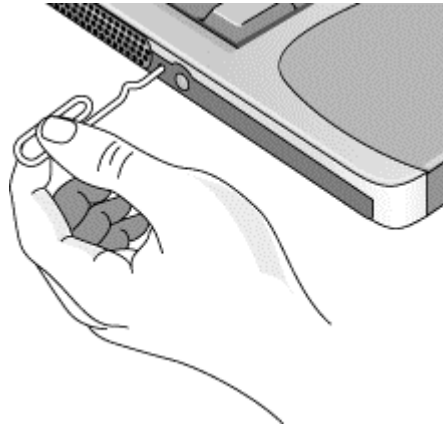
Figure 1-6. Resetting the Computer

Resetting an Expansion Base

To reset an expansion base—and the computer, if docked (see the following page)—insert a straightened paper clip into the reset hole on the bottom of the expansion base. You can also reset the expansion base by undocking the computer and removing all AC and battery power from the base.

> **Note**
>
> To boot from a CD-ROM or DVD drive in the expansion base, insert a bootable CD (such as the *Recovery CD*) into the drive, then restart the computer. Press ESC when the HP logo appears during reboot, then select the CD-ROM/DVD drive as the temporary boot device.

Docking and Undocking the Computer

You can dock or undock the computer in any power state: on, off, Standby mode, or Hibernate mode. Make sure, however, that the computer is not entering or resuming from Standby or Hibernate mode when you dock or undock, or the computer could lock up.

Docking the Computer

By default, the computer automatically turns on when you dock it. If you have trouble inserting the computer or the docking latches stick, use the emergency undock latch.

1. **Optional:** plug the AC adapter into the expansion base.

2. Insert the back of the computer into the expansion base, then lower the front end into the base and press down firmly until it clicks into place.

Figure 1-7. Docking the Computer

Undocking the Computer

1. Press the undock switch. (You can use the undock switch when the computer is on, off, or in Standby or Hibernate mode.)

   –or–

   Click Start, Eject PC.
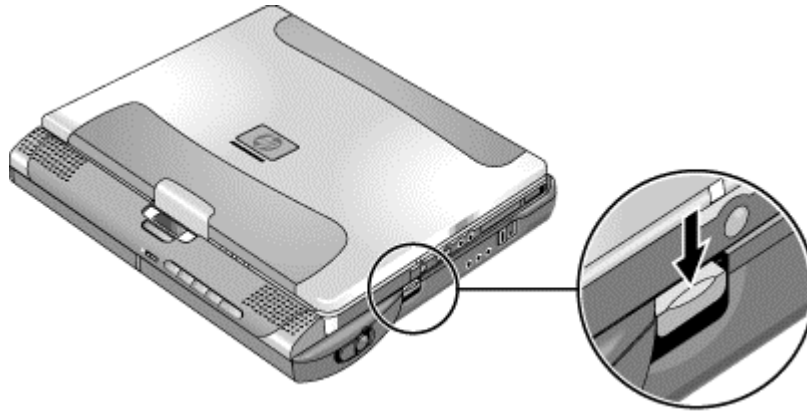
Figure 1-8. Undocking the Computer

You may need to wait 10 seconds or more for the computer to undock—the computer may not respond while it is updating its configuration.

2. If the computer will not undock using the undock switch or Start menu, use the emergency undock latch: slide the button down, then move the entire latch forward.
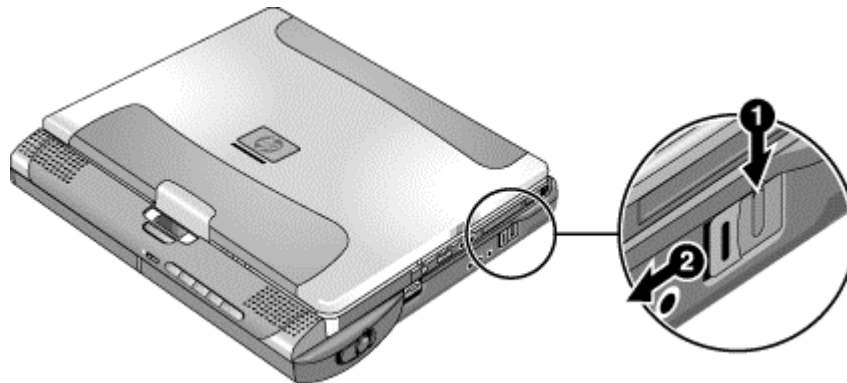
Figure 1-9. Manually Undocking the Computer

Connecting a Floppy Disk Drive

When needed, you can connect the floppy disk drive to one of the computer's USB ports.

- Connect the USB floppy drive cable directly to the floppy drive and to the USB port.

  You cannot use the USB floppy cable to connect to any other type of drive module, such as a CD-ROM or DVD drive. The USB cable is for floppy drives only.
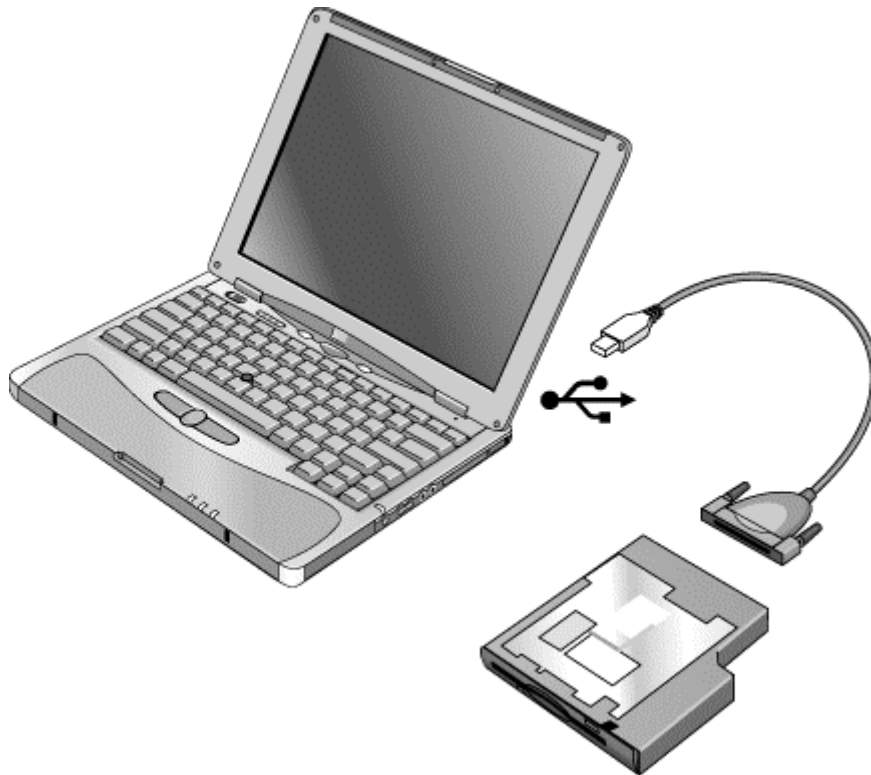
Figure 1-10. Connecting a Floppy Disk Drive

Specifications

The following tables list the specifications for the computer 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 500 Series Specifications

Physical Attributes	**Computer:** Size: 278 × 222 × 25 mm (10.9 × 8.7 × 1.0 in). Weight: 1.5 kg (3.4 lb) minimum, depending on model. Magnesium casing with rubberized grip surfaces. **Computer docked in expansion base:** Size: 298 × 257 × 45 mm (11.7 × 10.1 × 1.8 in). Weight: 2.4 kg (5.4 lb) minimum, depending on model.
Processor and Bus Architecture	600- to 750-MHz Intel Mobile Pentium III processor with Speed Step technology with 256-KB four-way set-associative L2 cache. –or– 500- to 600-MHz Intel Celeron processor with 128-KB four-way set-associative L2 cache. 1.35/1.1-V (Pentium III) or 1.35-V (Celeron) core, 2.5-V external, low-power processor. 32-KB (16-KB instruction, 16-KB data) L1 cache. 32-bit PCI bus.
Graphics	12.1-inch XGA active-matrix (TFT) display (1024 × 768 × 16M colors). Zoomed Video support for 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 (11.1 or 14.8 Vdc) with LED charge-level gauge. Battery life (single battery): over 4 hours typical (varies with model and usage). Fast battery recharge: approximately 2 hours. Low-battery warning. Suspend/resume capability. Universal AC adapter: 100–240 Vac (50/60 Hz) input, 19 Vdc output, 60–65 W. Optional secondary battery available for expansion base module bays.
Mass Storage	**Computer:** 7.5- to 30-GB removable hard disk drive. 1.44-MB floppy drive module. **Expansion base:** Two bays for plug-in drive modules. Optional drive modules available.
SDRAM	Two slots for SDRAM expansion (SODIMM, PC100 or higher) up to 512 MB. 64-, 128-, or 256-MB SDRAM installed in system SDRAM slot under keyboard. 100-MHz SDRAM bus.

Audio System	**Computer:** Built-in speaker. 3D-enhanced PCI bus audio with Zoomed Video support. Built-in microphone. Separate audio-off button with indicator light. Headphone-out and microphone-in. **Expansion base:** CD player (can play with or without computer docked). Stereo sound via three built-in speakers. Analog pass-through from the computer. Headphone-out, microphone-in, and audio line-in.
Keyboard and Pointing Device	84/85/87-key touch-type QWERTY keyboard with 101/102 key emulation. Embedded numeric keypad. 12 function (Fn) keys. Two user-programmable One-Touch buttons. Pointing stick (TrackPoint technology licensed from IBM). Left and right click buttons, center scroll button.
LAN (3Com)	Ethernet 10Base-T (10 Mbps) and 100Base-TX (100 Mbps) support. Supports wake-on-LAN, fast IP, DMI, dRMON. MBA (Managed Boot Agent) support for PXE/BINL, BOOTP, NCP/IPX, DHCP.
Modem (3Com, US Robotics)	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. Local modem adapter provided for non-U.S. regions.
802.11 Wireless LAN	Radio: IEEE 802.11b compliant, ISM frequency band, Direct Sequence Spread Spectrum. Operating frequency: within 2.4–2.497 GHz, depending on country (US, Canada, ETSI, Japan). Channels: up to 13 channels (22 MHz bandwidth) that can overlap and are dependent upon the country configuration. Data rate: 1, 2, 5.5, or 11 Mbps. RF output: 15 dBm typical (approx. 30 mW), 16 dBm max (approx. 40 mW). Sensitivity: –84 dBm. Range: up to 100 m (300 ft) or more, depending on environment and conditions. On-off button with power indicator. USB interface.
Input/Output	**Computer:** Two universal serial bus (USB) ports. 15-pin VGA video-out with DDC support. (Resolution up to 1600 × 1200 × 64K or 16M colors. Refresh rate of 60 to 100 Hz, depending on resolution and color depth. Dual display.) 4-Mbps IrDA-compliant infrared port. **Expansion base:** Two universal serial bus (USB) ports. 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 of 60 to 100 Hz, depending on resolution and color depth. Dual display.) S-video (TV out). PS/2 keyboard and PS/2 mouse.
Expandability	**Computer:** One Type II 16-/32-bit PC Card slot (3.3 V and 5 V support). CardBus enabled, Zoomed Video support. **Expansion base:** Two plug-in module bays for accessory modules.

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 (41 to 95 °F). Operating altitude: up to 3000 m (10,000 ft) at 25 °C (77 °F). Storage temperature: –20 to 50 °C (–4 to 122 °F).
Major ICs	**Computer:** 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 1410. Keyboard/embedded controller: National NS87570. Super I/O: National NS97338. **Expansion base:** Embedded controller: National NS87570. PCI IDE controller: CMD PCI-648. Audio controller: OZ163.

Table 1-8. Omnibook 500 Series Accessories

Accessory	Description	Omnibook 500	Compat. 6000	Compat. 900B
Memory				
F1457B	64-MB SDRAM module (PC100)	•	•	•
F1457C	64-MB SDRAM module (PC133)	•	•	•
F1622B	128-MB SDRAM module (PC100)	•	•	•
F1622C	128-MB SDRAM module (PC133)	•	•	•
F1654A	256-MB SDRAM module (PC100)	•	•	•
F1654C	256-MB SDRAM module (PC133)	•	•	•
Hard Drives				
0950-4030	7.5-GB hard disk drive	•		
0950-4011	7.5-GB hard disk drive	•		
0950-3934	10-GB hard disk drive	•		
0950-3985	10-GB hard disk drive	•		
0950-3935	20-GB hard disk drive	•		
0950-4162	30-GB hard disk drive	•		
Multimedia Expansion Base				
F2096B	Multimedia expansion base	•		
Plug-in Modules				
F2008A	Floppy disk drive cable (parallel)	•	•	
F2009A	Zip drive module	•	•	
F2013A	Floppy disk drive module	•	•	
F2015A	DVD drive module	•	•	
F2017A	CD-ROM drive module	•	•	
F2018A	Second hard drive module with 18-GB hard drive	•	•	
F2018B	Second hard drive module with 20-GB hard drive	•	•	
F2018C	Second hard drive module with 30-GB hard drive	•	•	
F2022A	LS-120 drive module	•	•	
F2026A	CD-RW drive module	•	•	
F2101A	USB floppy disk drive cable	•		
F2107A	DVD-ROM/CD-RW drive module	•	•	
Power Options				
F1454A	60W AC adapter	•	•	•
F1455A	75W auto/airline power adapter (12 V)	•	•	•
F1781A	60W Ultraslim AC adapter	•	•	•
F2011A	External lithium-ion battery charger for F2014A	•	•	
F2014A	Lithium-ion secondary battery	•	•	
F2098A	Main battery (11.1 V, 6-cell)	•		

Accessory	Description	Omnibook 500	Compat. 6000	Compat. 900B
8120-6312 8120-6313 8120-6314 8120-6316 8120-6317 8120-8367 8120-8373 8120-8452 8120-8699	Replacement power cord (Australia) Replacement power cord (U.S./Canada/Taiwan) Replacement power cord (Europe) Replacement power cord (Japan) Replacement power cord (India/South Africa) Replacement power cord (Argentina) Replacement power cord (China) Replacement power cord (Chile) Replacement power cord (UK [EPSR] Hong Kong/Singapore)	•	•	•
PC Cards				
F1623A	10/100-Mbps Ethernet + 56-Kbps modem PC Card by Xircom	•	•	•
F1625A	56-Kbps global modem PC Card by Xircom	•	•	•
F1626B	10/100-Mbps Ethernet PC Card by 3Com	•	•	•
F1627A	56-Kbps U.S. modem PC Card by Xircom	•	•	•
F1782A	10/100-Mbps Ethernet + 56-Kbps modem PC Card by 3Com	•	•	•
F1985A	10/100-Mbps USB-Ethernet adapter by 3Com	•	•	•
F2135B	802.11b wireless LAN access point for use with F2136A	•	•	•
F2136A	802.11b wireless LAN PC Card	•	•	•
F2138A	HP/Sierra Wireless Air Card 300 CDPD PC Card	•	•	•
F2196A	Bluetooth PC Card by 3Com	•	•	•

Internal Design

The motherboard PCA is the central component of the computer's design, and plays a role in virtually all system functions. Most components connect directly to the motherboard.

The following figure shows the connections among the replaceable components in the computer and expansion base. In addition, Table 1-9 on page 1-20 lists the roles that these components play in the functional subsystems of the computer and expansion base.
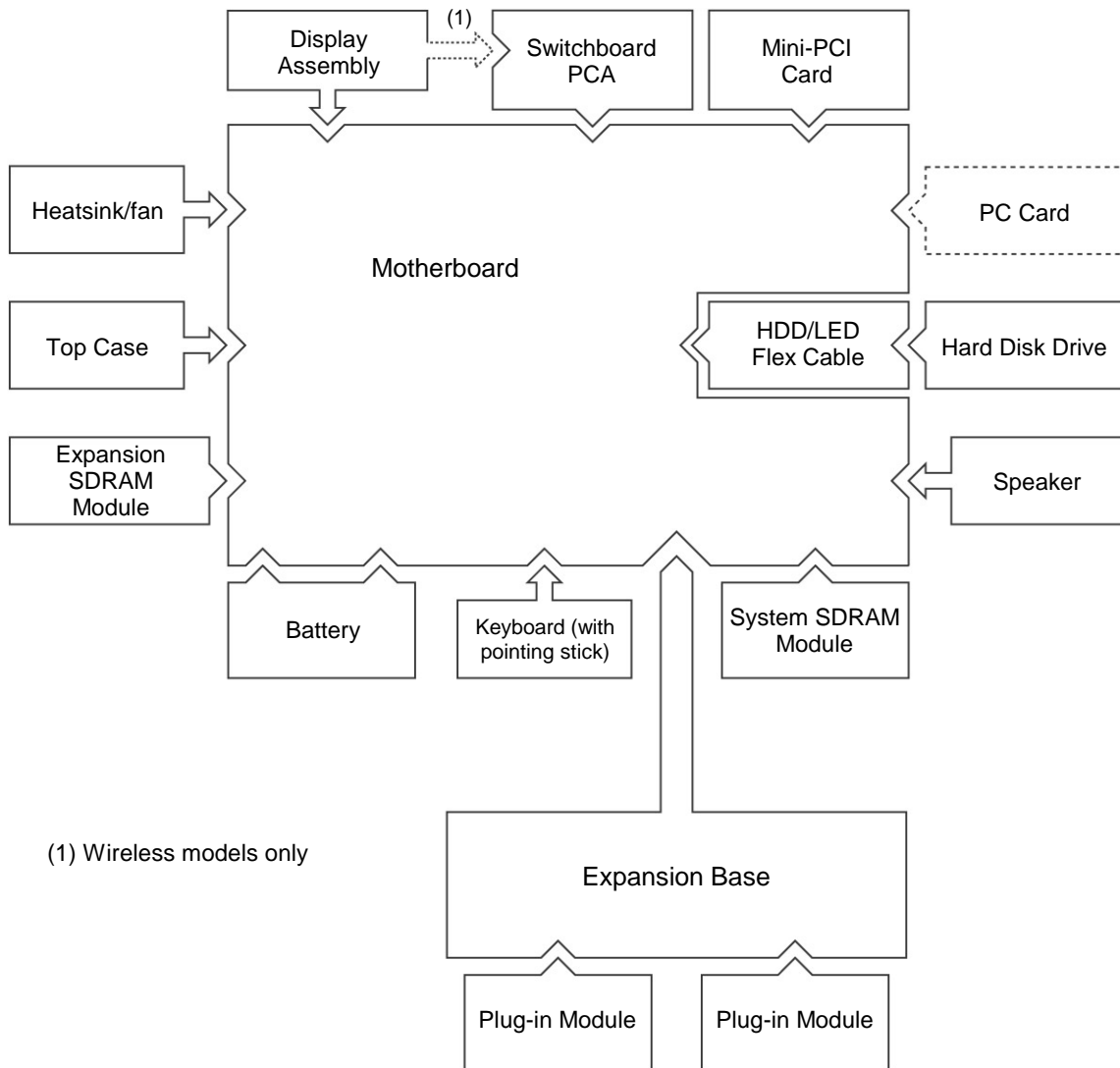
Figure 1-11. Replaceable Component Diagram

Table 1-9. Functional Structure

Function	Components Used	Component Roles
Bootup	Motherboard	Main processor, primary system circuitry.
	Hard disk drive	First source of disk-based startup code.
	Removable device	Second source of disk-based startup code.
Processor	Motherboard	Main processor, numeric data processor, L1 and L2 cache, primary system circuitry.
Memory	Motherboard	Video RAM.
	SDRAM modules	Changeable SDRAM (2 slots).
Power	Main battery	Power storage.
	Motherboard	AC adapter socket, power switch, lid switch, system-off switch, power supply, power control circuitry.
	Switchboard PCA	Sleep switch.
	Backup battery	Provides short-term power to maintain memory while swapping main battery.
	CMOS battery	Maintains system data stored in CMOS RAM.
	Expansion base	AC adapter socket, system-off switch, power supply, power control circuitry.
	AC adapter	AC-to-DC converter.
Display	Motherboard	PCMCIA/Zoomed Video controller, display drivers, LVDS processing, display/graphics controller, video RAM.
	Display assembly	Display output, backlight, power converter for backlight.
Hard disk	Motherboard	Hard disk controller.
	HDD/LED flex cable	Hard disk signal pass-through.
	Hard disk drive	Hard disk mechanism.
Keyboard	Motherboard	Keyboard BIOS, keyboard controller.
	Keyboard	Key switches.
	Switchboard PCA	One-Touch switches.
Pointer	Motherboard	Keyboard BIOS, pointing stick controller (PS/2 output), keyboard controller.
	Keyboard	Pointing stick sensor.
	Top case	Click buttons, scroll button.
Audio	Motherboard	Audio controller, audio decoder, speaker amplifier, Zoomed Video controller, microphone, external audio jacks, headphone amplifier, audio-off switch.
	Bottom case	Speaker.
	Expansion base	CD player, audio circuitry, speakers.
Status	Motherboard	LED circuitry, keyboard controller.
	Switchboard PCA	Keyboard LEDs.
	HDD/LED flex cable	Main status LEDs.
	Top case	Audio-off LED.
	Expansion base	Status panel.
Serial	Motherboard	I/O controller.
	Expansion base	Serial connector.
Parallel	Motherboard	I/O controller.
	Expansion base	Parallel connector.
Infrared	Motherboard	I/O controller, infrared transmitter/receiver.
Wireless	Display assembly	Radio PCA, circuitry, and antennas, on-off button, and indicator light.
	Motherboard	I/O controller.
	Switchboard PCA	Power/signal pass-through.
PS/2 ports	Motherboard	Keyboard controller.
	Expansion base	PS/2 connectors.
USB	Motherboard	Bus controller (South Bridge), USB connectors, overload switch.
	Expansion base	USB connectors, overload switch.
Docking	Motherboard	Docking logic, docking connector.
	Expansion base	Docking connector, undock switch, emergency undock latch.
PC Card	Motherboard	PC Card controller, PC Card connector.

2

Removal and Replacement

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

Table 2-1. Removal Cross-Reference

Battery, backup (page 2-34).
Battery, CMOS (page 2-34).
• Battery, main (page 2-4).
Cable, hard drive/LED flex (page 2-34).
• Card, mini-PCI (page 2-14).
Case, bottom (page 2-25).
Case, top (page 2-23).
• Cover, SDRAM (page 2-17).
• Covers, display hinge (page 2-17).
• Covers, display screw (page 2-17).
• Cover, Trackpoint (page 2-17).
Display assembly (page 2-18).
Doors, docking (page 2-31).
• Drive, hard disk (page 2-6).

• Feet, rubber (page 2-17).
Guide, hard drive (page 2-34).
Heatsink/fan (page 2-21).
• Keyboard (page 2-10).
• Module, plug-in (page 2-5).
• Module, SDRAM (page 2-12).
Panel, audio/PCMCIA (page 2-35).
Panel, mini-PCI (page 2-35).
• Panel, power button (page 2-9).
PCA, motherboard (page 2-25).
• PCA, switchboard (page 2-16).
Plate, EMI (page 2-35).
Speaker (page 2-35).
• Tray, hard disk drive (page 2-7).

Caution

Always provide proper grounding when performing repairs. Without proper grounding, an electrostatic discharge can damage the computer or expansion base and their components.

Notes

Reassembly steps are the reverse of the removal/disassembly steps. Reassembly notes are included at the end of each removal procedure.

◼ 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 computer to access components.

```
                          ┌──────────────┐
                          │    Start     │
                          └──────────────┘
                                 │
                                 ▼
        ┌─────────────────────────────────────┐        • Expansion SDRAM module*
        │      Main battery, AC adapter        │ ─────▶ • Hard disk drive*
        └─────────────────────────────────────┘
                                 │
                                 ▼
        ┌─────────────────────────────────────┐
        │         Power button panel           │ ─────▶ • Switchboard PCA* ‡
        └─────────────────────────────────────┘
                                 │
                                 ▼
  If removing only │            ┌─────────────────────────┐        • Mini-PCI card
  the display      │            │        Keyboard         │ ─────▶ • Speaker
                   │            └─────────────────────────┘        • System SDRAM module*
                   │                      │                        • Heatsink/fan*
                   │                      ▼
                   │            ┌─────────────────────────┐
                   └──────────▶ │ Wireless models only:   │
                                │   Switchboard PCA       │
                                └─────────────────────────┘
                                          │
                                          ▼
                                ┌─────────────────────────┐
                                │    Display assembly     │
                                └─────────────────────────┘
                                          │
                                          ▼
                                ┌─────────────────────────┐        • Hard drive/LED flex cable
                                │        Top case         │ ─────▶ • Backup battery
                                └─────────────────────────┘        • Audio/PCMCIA panel
                                          │                        • Hard drive guide
                                          ▼                        • Mini-PCI panel
                                ┌─────────────────────────┐
                                │    Motherboard or       │
                                │    bottom case          │
                                └─────────────────────────┘
```

* Also remove these components when removing the motherboard or bottom case.

‡ Also remove this component when replacing the top case.

Figure 2-1. Disassembly Flow

Table 2-2. Required Equipment

- #0 Phillips screwdriver, preferably magnetized.
- Small flat-blade screwdriver.

Table 2-3. Recommended Screw Torques

Screw Thread Size	Torque (cm-kgf)	Torque (in-lbf)
M2	1.3 – 1.8	1.1 – 1.5
M3	3.0 – 3.5	2.6 – 3.0

Caution

Be careful not to overtighten screws that go directly into magnesium components, or you could strip the threads in the magnesium.

Removing the Main Battery
(User-Replaceable)

One or two plug-in modules can be inserted in the module bays in the expansion base. The computer itself has no module bays.

Required Equipment

- None.

Removal Procedure

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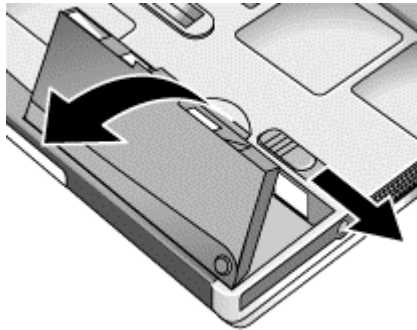
Figure 2-2. Removing the Main Battery

Reassembly Note

- Insert the front end of the battery into the battery compartment, then press the back end in until it clicks into place.

Removing a Plug-In Module
(User-Replaceable)

Required Equipment

- None.

Removal Procedure

- Press the button on the module release latch, and slide the latch toward the front of the expansion base.
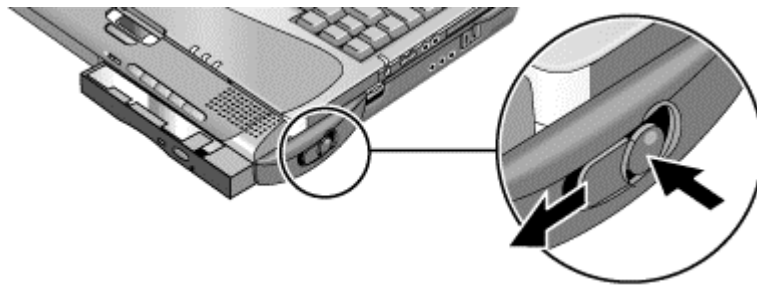
Figure 2-3. Releasing the Module

Removing the Hard Disk Drive
(User-Replaceable)

Table 2-4. Hard Disk Drive Replacement Part Numbers

Description	Part Number	Exchange Part Number
Drive, hard disk (7.5 GB, 9.5 mm, Hitachi)	0950-4011	F2112-69002
Drive, hard disk (7.5 GB, 9.5 mm, IBM)	0950-4030	F2112-69003
Drive, hard disk (10 GB, 9.5 mm, IBM, DJSA-210)	0950-3934	F1660-69112
Drive, hard disk (10 GB, 9.5 mm, Toshiba, MK1016 GAP)	0950-3985	F2072-69109
Drive, hard disk (20 GB, 9.5 mm, IBM, DJSA-220)	0950-3935	F1660-69113
Drive, hard disk (30 GB, 9.5 mm, IBM part no. 07N6714)	0950-4162	F2072-69115

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. From the bottom of the unit, remove the hard drive retaining screw.

3. Carefully pull the hard drive out of the computer.

Screw, M2×3mm
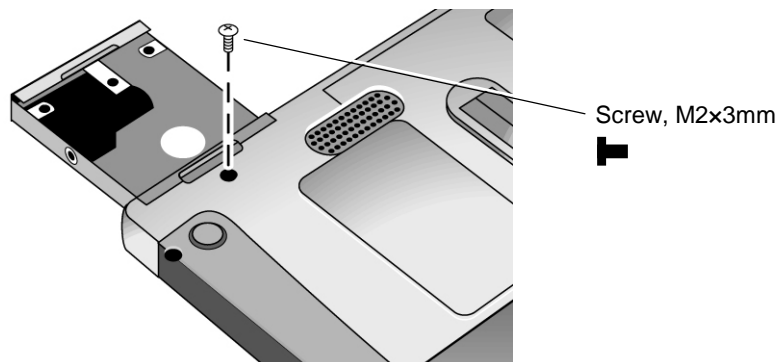
Figure 2-4. Removing the Hard Disk Drive

4. Remove all four screws from the tray and drive case, then lift the drive out of the tray.

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 side so that the connector slides off evenly without bending the connector pins.
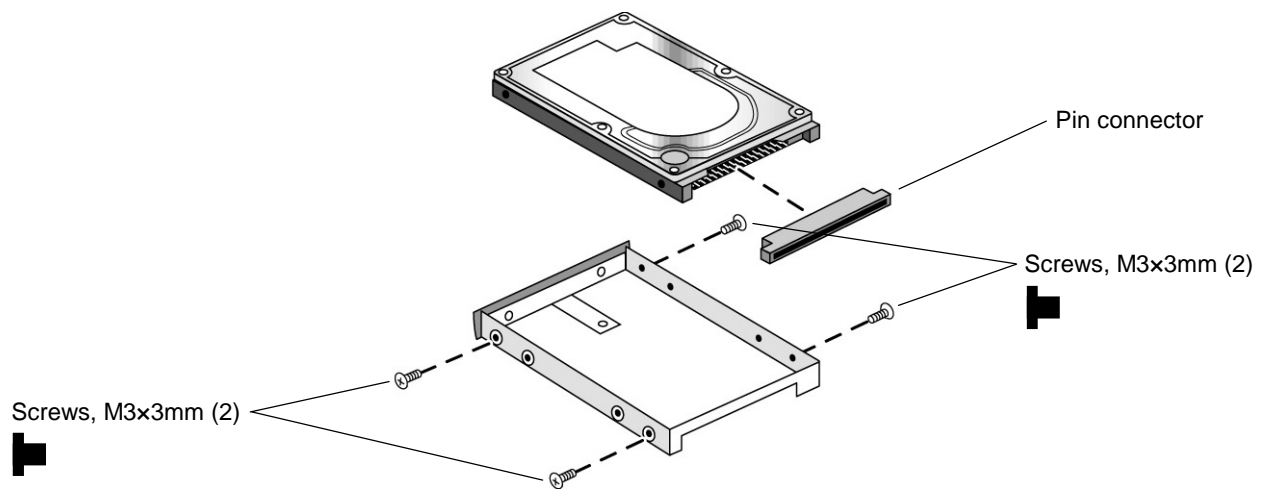
Figure 2-5. Removing the Hard Disk Tray

Reassembly Notes

- Carefully put the pin connector back onto the pins on the end of the new hard drive. Work at each end alternately so that the connector slides on evenly without bending the connector pins.

- Insert the connector through the end of the tray, and lower the drive into place.

- Slide the drive into the hard drive compartment. Press firmly to make sure the connector seats properly.

Important

If you are installing a new hard disk drive, create a Utility partition on the drive before loading any software — see "Creating a Utility Partition," below.

Creating a Utility Partition

When you install a new hard drive, you must create a Utility partition on the drive before loading any software. You can use any Omnibook 500 *Recovery CD* to create the Utility partition.

1. Dock the computer, and plug in the AC adapter.

2. Insert a CD-ROM/DVD drive in the expansion base.

3. Insert the *Recovery CD* in the drive, then restart the computer.

4. When you see the HP logo, press ESC to display the boot menu, then select the CD-ROM 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.

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

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

6. **Important:** When prompted to reboot the computer, first undock it *and remove it from the expansion base*, then press CTRL+ALT+DEL and follow any instructions that appear.

Removing the Power Button Panel

(User-Replaceable)

Required Equipment

- None.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Insert a fingernail into the slot in the right end of the panel (behind the Del key), and pry the right end of the panel up. Lift the end until the panel unsnaps above the F12 key, then slide the panel slightly to the right and lift it out.
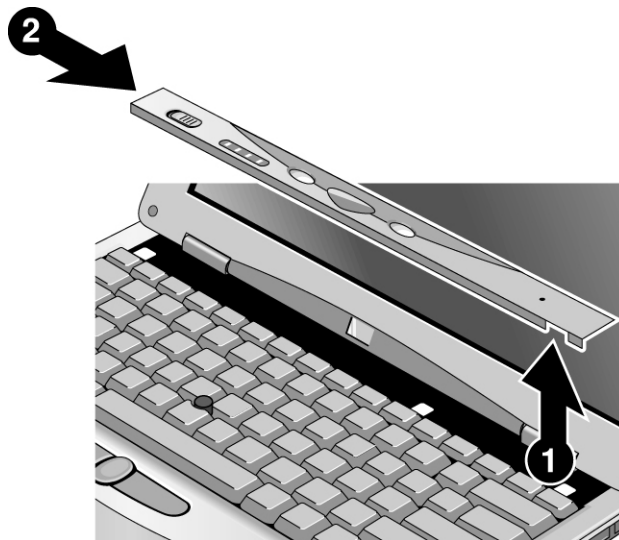
Figure 2-6. Removing the Power Button Panel

Reassembly Notes

- Hold the panel in your right hand, and insert the tabs on its left end into the slots in the computer case just above the ESC and F4 keys. Slide the panel to the left and press it into place.

Removing the Keyboard

(User-Replaceable)

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove the power button panel (page 2-9).

3. Remove the three retaining screws from the top of the keyboard.
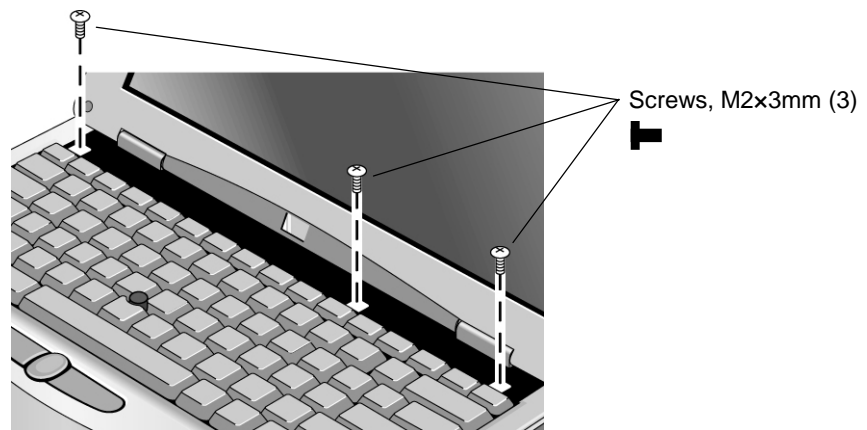
Figure 2-7. Removing the Keyboard Screws

Caution
When opening the keyboard, be careful not to pull on the cables that connect the keyboard to the computer.

4. Raise the top edge of the keyboard slightly, then slide it back about 1 cm (1/2 in) and fold it onto the front of the case.
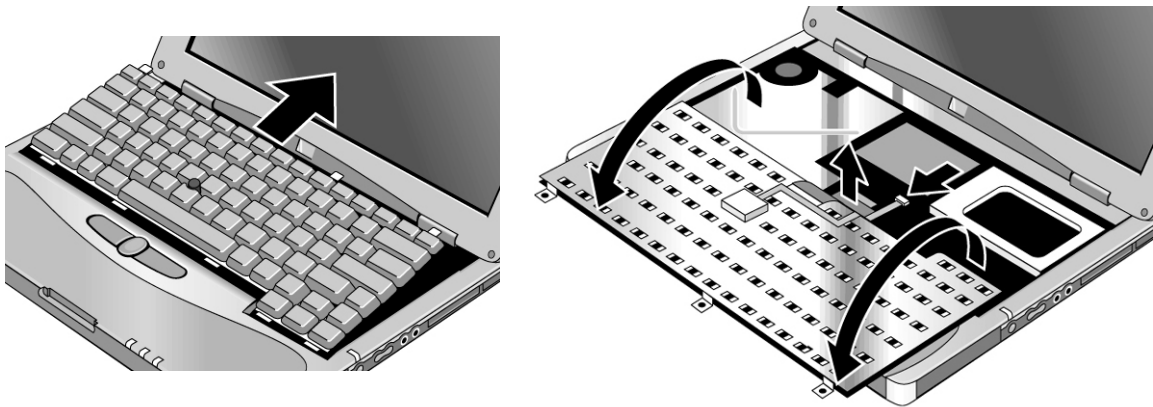
Figure 2-8. Removing the Keyboard

Warning

Do not touch the metal surfaces inside the computer until they have cooled off. They could be very hot if the computer was running recently.

---

5. Disconnect the pointing stick flex cable, and lift the keyboard flex cable off of its connector. You may need to move the mini-PCI cables for best access to the keyboard and pointing stick cables.

6. Remove the keyboard from the computer.

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. Make sure the keyboard cable connector is firmly seated, and that the pointing stick flex cable is not pinched.

- Make sure all cables under the keyboard are routed so as not to interfere with other components, or with reinstalling the keyboard.

- Make sure the cables from the mini-PCI card lie as flat as possible.

- Slide the front edge of the keyboard into the computer case, then press the top of the keyboard into place.

Removing an SDRAM Module
(User-Replaceable)

The Omnibook 500 has no SDRAM built in, but includes a system SDRAM slot beneath the keyboard that contains an SDRAM module installed at the factory, and a slot on the bottom of the unit for an expansion SDRAM module. You can use PC100 or PC133 SDRAM for these products.

Table 2-5. SDRAM Module Replacement Part Numbers

Description	Part Number	Exchange Part Number
SDRAM module, 64 MB, PC100 SODIMM	1818-7951	F1660-69103
SDRAM module, 64 MB, PC133 SODIMM	1818-8510	
SDRAM module, 128 MB, PC100 SODIMM	1818-7952	F1660-69104
SDRAM module, 128 MB, PC133 SODIMM	1818-8504	TBD
SDRAM module, 256 MB, PC100 SODIMM	1818-7953	F1660-69101
SDRAM module, 256 MB, PC133 SODIMM	1818-8534	TBD

Caution

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

Required Equipment

- None.

Removing a System SDRAM Module

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove the power button panel (page 2-9).

3. Open the keyboard (page 2-10, though step 4). You don't need to disconnect the keyboard cables.

4. Release the latches at the sides of the SDRAM module (so that the free edge of the module pops up), then pull the module out of the connector.
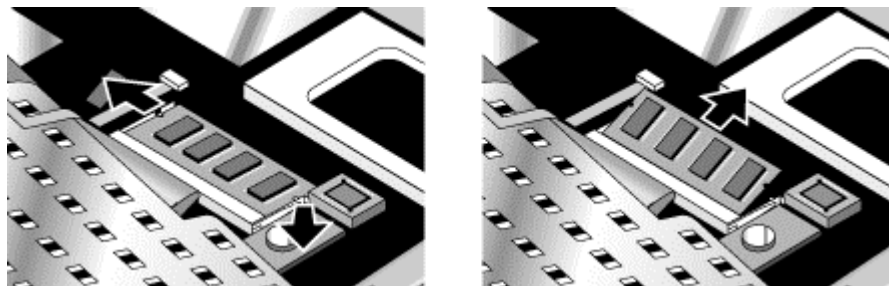
Figure 2-9. Removing the System SDRAM Module

Reassembly Note

- Carefully insert the edge of the new SDRAM module into the connector at about a 30° angle until it is fully seated. Then press down on both sides of the module until the latches snap closed.

Removing an Expansion SDRAM Module

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. From the bottom of the computer, remove the screw from the SDRAM cover, and remove the cover.

3. Release the latches at the sides of the SDRAM module (so that the module's free edge pops up), then pull the module out of the connector.

Screw, M2×3mm
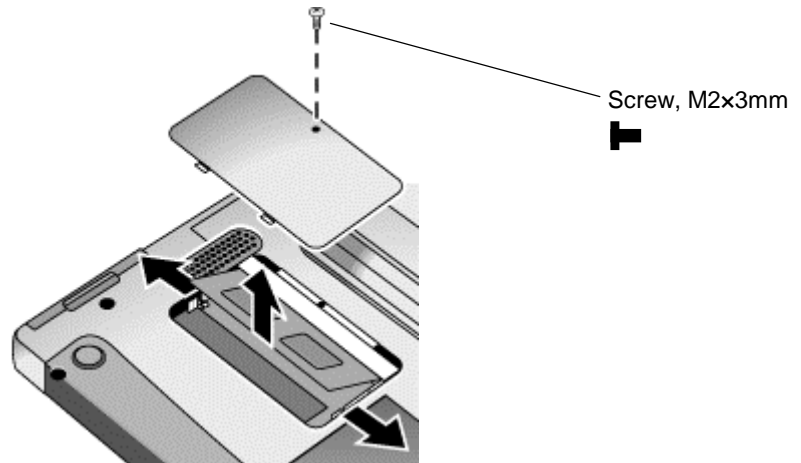
Figure 2-10. Removing an SDRAM Expansion Module

Reassembly Note

- Carefully insert the edge of the new SDRAM module into the connector at about a 30° angle until it is fully seated. Then press down on both sides of the module until the latches snap closed.

Removing a Mini-PCI Card (certain models only)
(User-Replaceable)

Important

- **If the notebook is an option code ARE (for Malaysia), the mini-PCI card can be replaced only by the regional repair center in Taiwan. Contact the HP Call Center in your region for shipping information.**

- **Notebooks repaired in China (option code AB2), Malaysia (option code ARE), or South Africa (option code ACQ) can use only the mini-PCI cards with regulatory labels, as shown in the following table and in Chapter 4.**

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

Description	Part Number	Exchange Part Number
Card, mini-PCI (HW modem)	F2157-60928	
Card, mini-PCI (HW modem with regulatory labels for China, Malaysia, or South Africa)*	F2157-60929	
Card, mini-PCI (LAN/modem)	F2072-60902	
Card, mini-PCI (LAN/modem with regulatory labels for China, Malaysia, or South Africa)*	F2072-60994	

* Required for repair in China (option code AB2), Malaysia (option code ARE), or South Africa (option code ACQ).

Caution

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

Required Equipment

- None.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove the power button panel (page 2-9).

3. Open the keyboard (page 2-10, though step 4). You don't need to disconnect the keyboard cables.

Note: LAN/modem models only

You may need to remove the system SDRAM module (page 2-12) to provide enough clearance to disconnect all mini-PCI cables.

4. Disconnect the cable (modem models only) or cables (LAN/modem models only) from the card.

5. Release the latches at the sides of the card, so that its free edge pops up, and carefully pull the card out of its connector.
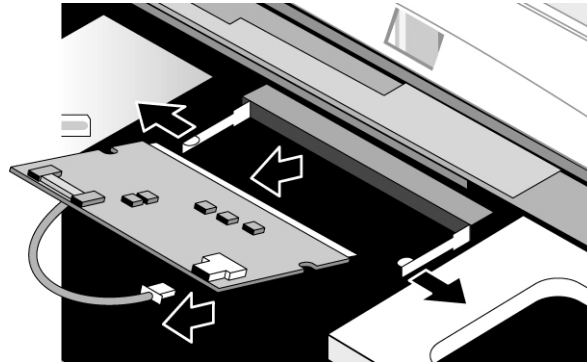
Figure 2-11. Removing the Mini-PCI Card (modem card shown)

Reassembly Notes

- Carefully insert the edge of the card into the connector at about a 30° angle until it is fully seated. Then press down on both sides of the card until the latches snap closed.

- Route the cable (modem models) or cables (LAN/modem models) between the heatsink/fan and mini-PCI card, so that they do not lie across or otherwise interfere with other components (see Figure 2-12, below). Make sure the cables lie as flat as possible, or they will prevent the keyboard from laying flat.
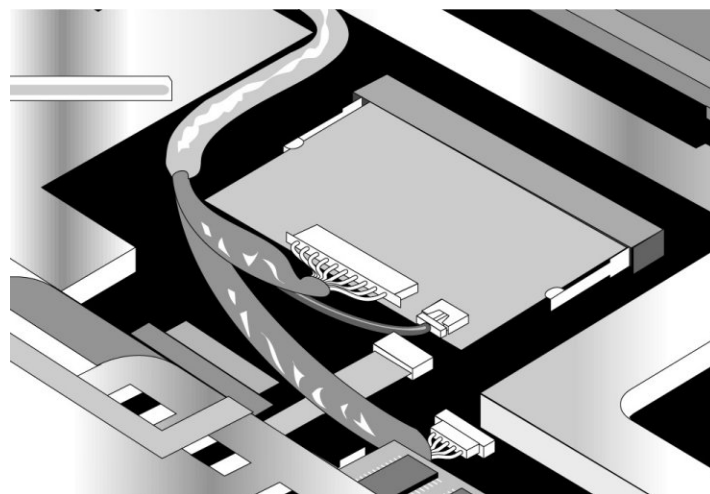
Figure 2-12. Routing the Mini-PCI Cables (LAN/modem card shown)

Removing the Switchboard PCA
(User-Replaceable)

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove the power button panel (page 2-9).

3. Remove the retaining screw from the switchboard PCA.

Caution: Wireless models only

When removing the switchboard PCA from the computer, be careful not to pull on the wireless cable that connects the display assembly to the PCA.

---

4. Insert a small flat-blade screwdriver through the narrow slot in the bottom case, and carefully pry the switchboard PCA off of the connector underneath.

5. **Wireless models only:** remove the wireless cable clip, and disconnect the wireless cable from the PCA.

6. Remove the PCA from the computer.

Screw, M2×3mm

Wireless cable clip attaches here
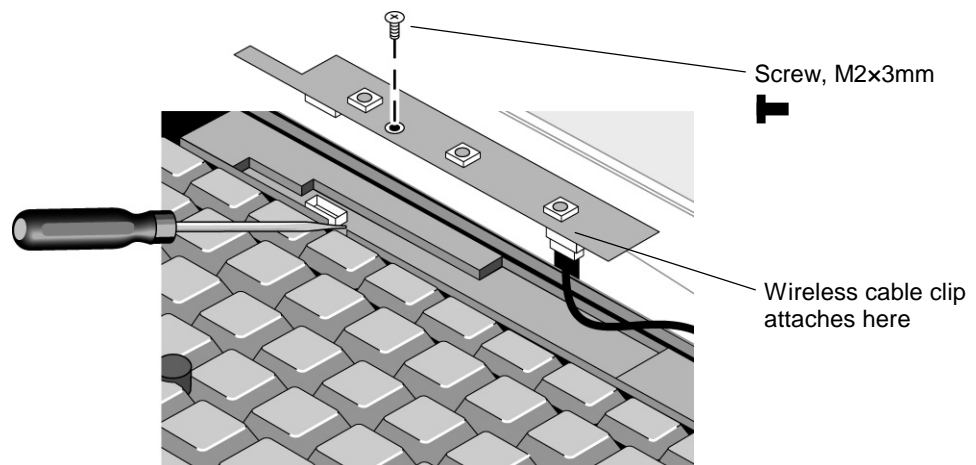
Figure 2-13. Removing the Switchboard PCA (wireless model shown)

Reassembly Notes

- **Wireless models only:** connect the wireless cable to the PCA, and reattach the cable clip.

- Insert the back end of the switchboard PCA into its opening in the top case, then press the PCA onto its connector.

Replacing Small Parts
(User-Replaceable)

The user can replace the following small parts.

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

Part	Replacement Procedure
Cover, SDRAM	From the bottom of the computer, remove the screw in the SDRAM module cover, then remove the cover.
Cover, Trackpoint	Pull the old cover off, and press the new cover into place.
Covers, display hinge	Use a flat-blade screwdriver to carefully pry the covers off of the hinges. **Reassembly Notes:** Insert the tab on the cover into the slot in the top case, and press the cover into place. Note that the right display hinge cover has a microphone icon on its front surface.
Covers, display screw	Insert a small flat-blade screwdriver under the screw cover and pry it loose. To replace, press the adhesive side of the cover firmly into the recess.
Feet, rubber (on bottom of computer and expansion base)	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.
Keyboard	See page 2-10.
Tray, hard disk drive	See page 2-6.

Removing the Display Assembly

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove both screws from the back of the computer.

3. Remove the power button panel (page 2-9).

4. **Wireless models only:** remove the switchboard PCA (page 2-16).

5. Open the display so that it lays flat, and use a flat-blade screwdriver to remove the display hinge covers.

6. Remove the screw from the display cable, then use a flat-blade screwdriver to lift the display cable off of its connector.

7. From the bottom of the computer, remove both screws from the display hinges.

Note

Do not remove the screws from the tops of the display hinges:

Do NOT remove!

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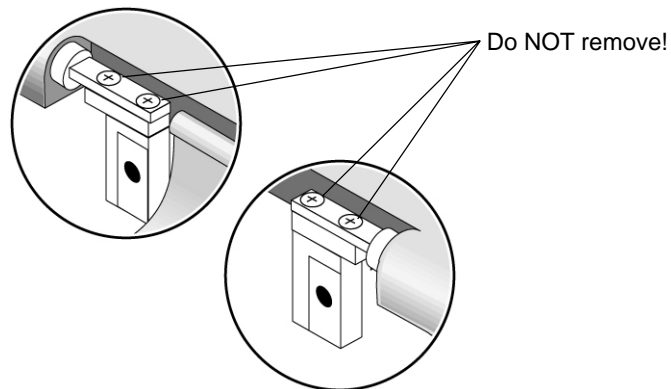
8. Lift the display off of the computer.
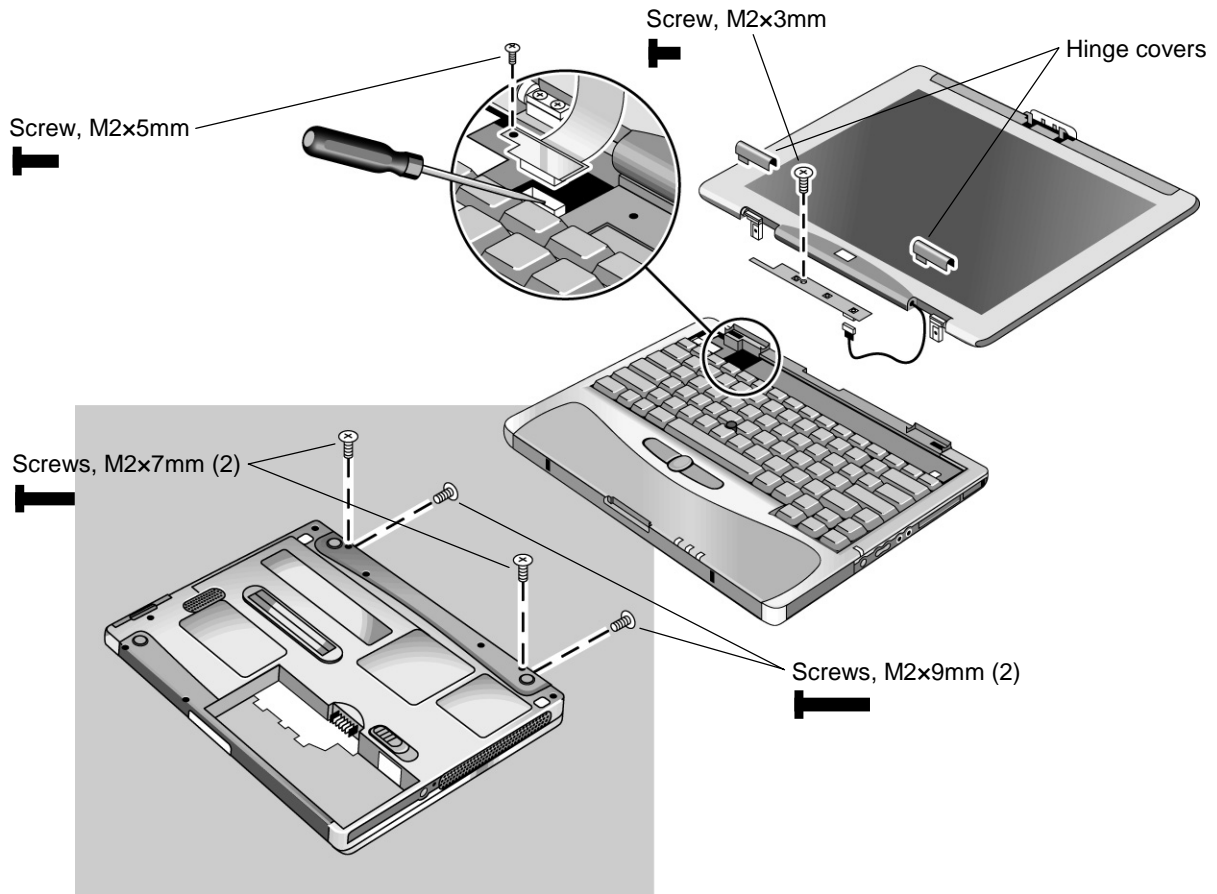
Figure 2-14. Removing the Display

Reassembly Notes

- Make sure the display cable fits in its opening in the computer's case, and lies behind the clip for the power button panel, as shown in Figure 2-15, below. Press the cable back onto its connector.
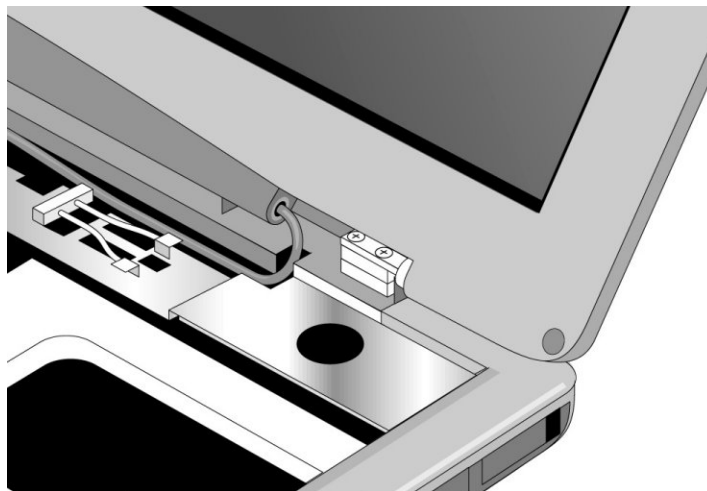
Figure 2-15. Routing the Display Cable

- Note that the right display hinge cover has a microphone icon on its front surface.

Important

After replacing the display, check the display type shown on the display's flex cable connector. If the new display is not the same type as the old display, you must use the Service Utilities floppy disk to reprogram the computer's EEPROM for the new display.

1. Download the Omnibook 500 service package from the Partnership web site (see page vi), and create a Service Utilities floppy disk as described in the package's Readme file.

2. Connect a floppy disk drive to the computer using a USB floppy cable, or dock the computer and insert a floppy drive module into the expansion base.

3. Connect an external monitor to the computer, so you can verify the boot process.

4. Plug in an AC adapter.

5. Insert the Service Utilities floppy disk in the floppy drive.

6. Turn on the computer:
   - If the HP logo appears on the computer's built-in display, STOP. The EEPROM is programmed correctly.
   - If the HP logo appears only on the external monitor, press ESC to display the boot menu, then boot from the floppy disk.

7. If you hear 5 beeps, press F1 to update the display data stored on the motherboard. Remove the floppy disk when the computer starts to reboot.

Removing the Heatsink/Fan

(HP Authorized Service Providers Only)

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove the power button panel (page 2-9).

3. Open the keyboard (page 2-10, though step 4). You don't need to disconnect the keyboard cables.

4. Remove the three retaining screws from the heatsink/fan.

> **Caution**
>
> When removing the heatsink/fan from the computer, be careful not to pull on the cable that connect the heatsink/fan to the motherboard.

5. Lift the heatsink/fan out of the computer.

6. Carefully disconnect the fan cable from the motherboard. If the connector does not release easily, try gently pressing down on the rear of the connector (near the wires) as you pull it out.

Screws, M2×3mm (3)

(M2x2mm in some models)
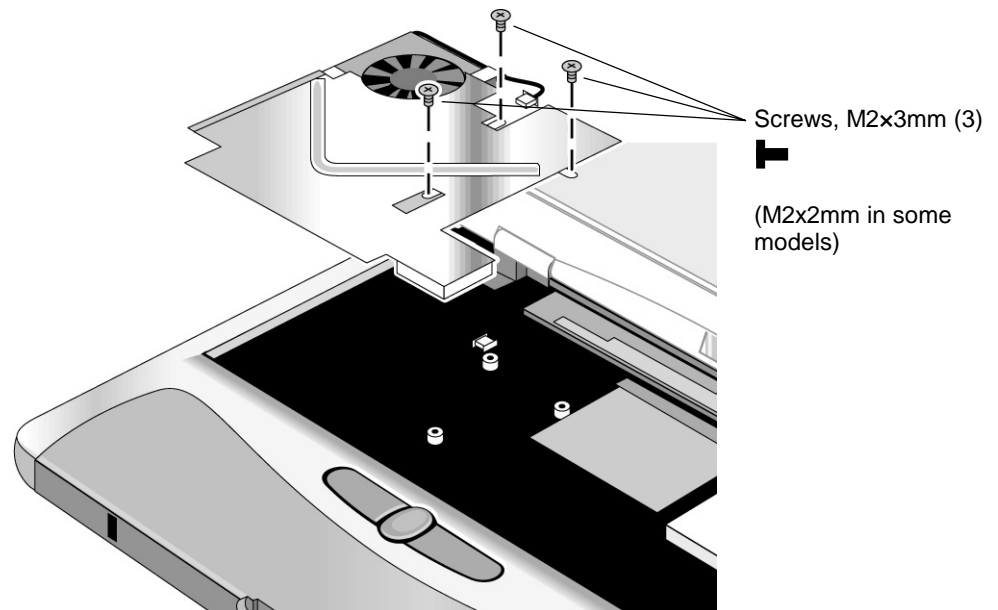
Figure 2-16. Removing the Heatsink/Fan

> **Caution**
>
> Do not spin the fan blades with your finger, or you could damage the fan's bearings.

---

7. To separate the fan from the heatsink, remove both connecting screws.

Screws, M2×3mm (2)
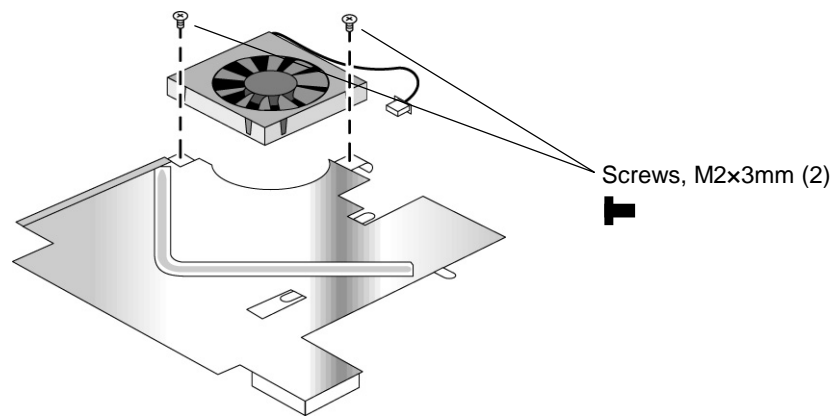
Figure 2-17. Separating the Heatsink and Fan

Reassembly Note

- Make sure the fan cable is retained by the hook on the underside of the heatsink.

Removing the Top Case

(HP Authorized Service Providers Only)

Required Equipment

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

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove these additional assemblies:

   - Hard disk drive (page 2-6).
   - Power button panel (page 2-9).
   - Keyboard (page 2-10).
   - Switchboard PCA (page 2-15).
   - Display assembly (page 2-18).

3. Remove the screws from inside the battery compartment.

4. Remove the six screws from the bottom case.

5. Remove the four screws from the top case.

6. Disconnect the click/scroll button flex cable.

7. Disconnect the audio-off LED cable.

8. Lift the top case off of the computer.

Screws, M2×5mm (4)

Screw, M2×7mm

Screws (2):
See **Note** below.

Screw, M2×7mm

Screws, M2×2mm (2)

Screws, M2×9mm (2)

Screw, M2×2mm
(not on all models)
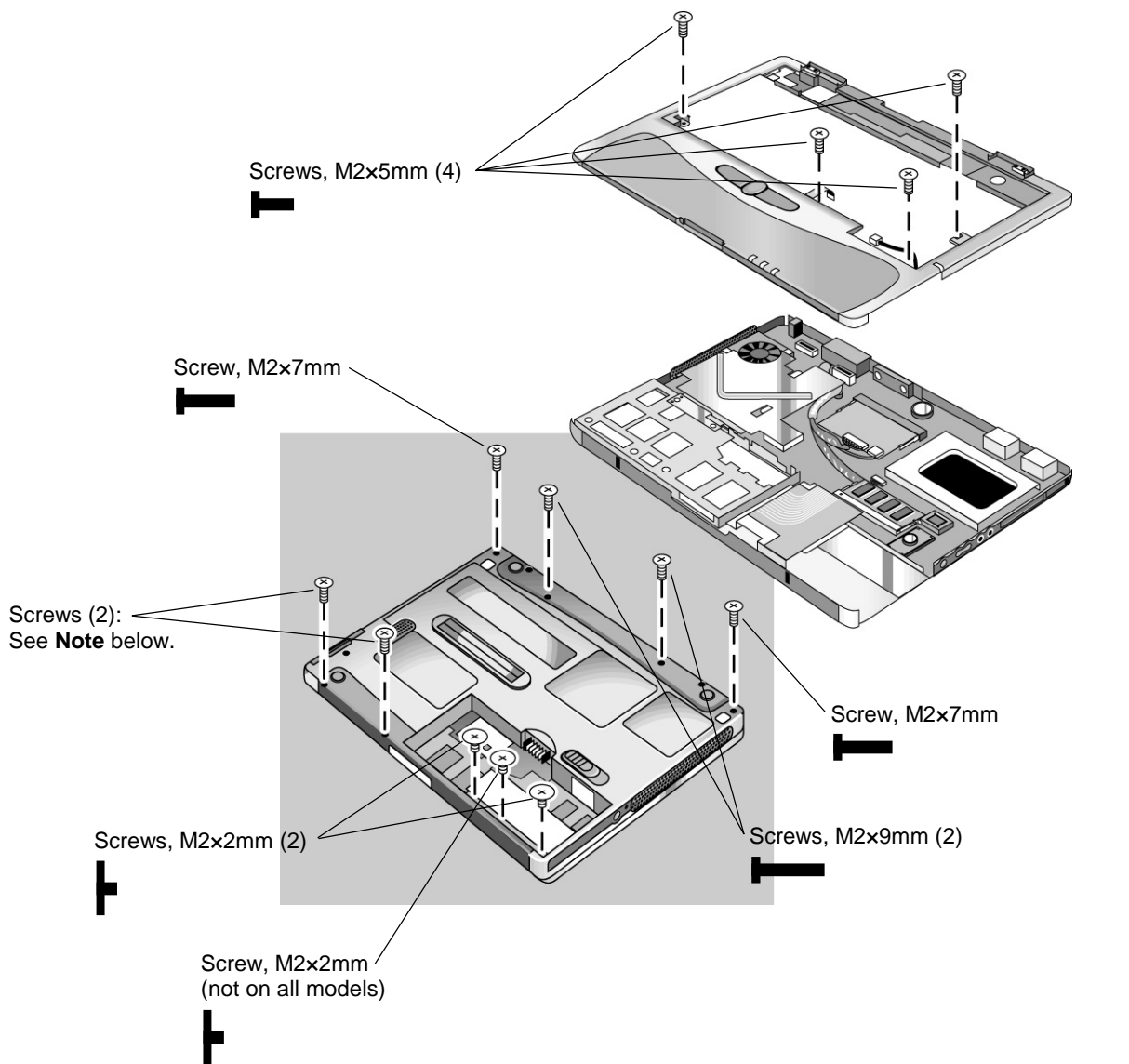
Note: The length of the screws required for the two positions near the front of the bottom case corresponds to the number of screws in the battery compartment:

• Models with two screws in the battery compartment: use M2×7mm

• Models with three screws in the battery compartment: use M2×9mm

Figure 2-18. Removing the Top Case

Removing the Motherboard or Bottom Case

(HP Authorized Service Providers Only)

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

Note: Before Replacing the Motherboard

If possible, record the computer's electronic serial number before you replace the motherboard. You will then store the electronic serial number in the EEPROM on the new motherboard using the Service Utility floppy disk.

1. Download the Omnibook 500 service package from the Partnership web site (see page vi), and create a Service Utilities floppy disk as described in the package's Readme file.
2. Connect a floppy disk drive to the computer using a USB floppy cable, or dock the computer and insert a floppy drive module into the expansion base.
3. Connect an external monitor to the computer, so you can verify the boot process.
4. Plug in an AC adapter.
5. Insert the Service Utilities floppy disk in the floppy drive.
6. Turn on the computer. When the HP logo appears (on either the built-in display or the external monitor), press ESC to display the boot menu, then boot from the floppy disk.
7. Select the Serial Number option from the boot menu.
8. When prompted, type A for the automatic update option. This stores the current system data from the old motherboard on the floppy disk.

---

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove these additional assemblies:

   - Hard disk drive (page 2-6).
   - Power button panel (page 2-9).
   - Keyboard (page 2-10).
   - System SDRAM module (page 2-12).
   - Expansion SDRAM module, if present (page 2-13).
   - Switchboard PCA (page 2-15).
   - Display assembly (page 2-18).
   - Heatsink/fan (page 2-21).
   - Top case (page 2-23).

3. Remove all three screws from the audio/PC Card panel. Flip out the PC Card eject button, so that it stands out from the side of the unit, then remove the panel.

---

4. Disconnect the speaker wires from the motherboard. If the connector does not release easily, try gently pressing down on the rear of the connector (near the wires) as you pull it out.

5. Remove the right-rear screw (nearest the speaker) from the hard drive/LED flex cable, then disconnect the cable from the motherboard.

6. Remove both standoff screws from the back of the unit.

7. Remove the four screws from the motherboard (each marked by a white arrow on the motherboard).

8. **Certain models only:** remove the screw attaching the EMI plate to the bottom case, and remove the EMI plate.

9. Lift the motherboard out of the bottom case.

See "Replacing the Motherboard" on page 2-27 or "Replacing the Bottom Case" on page 2-29 for additional procedures.
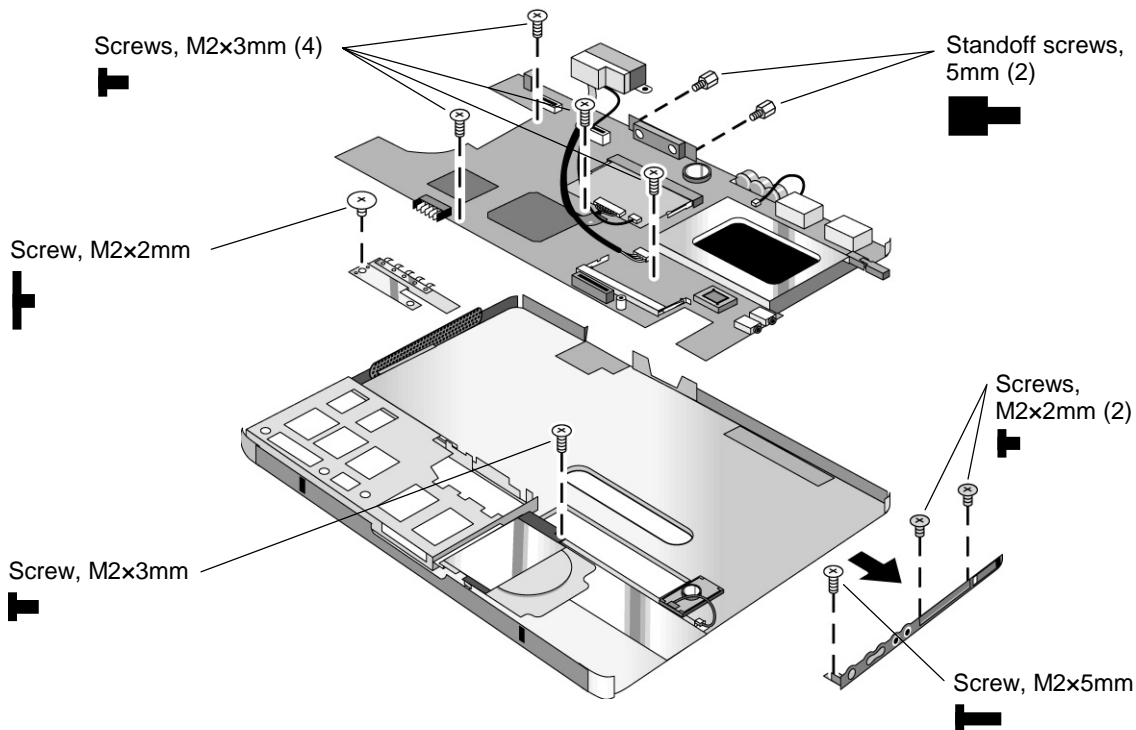
Figure 2-19. Removing the Motherboard

Reassembly Notes

- Insert the battery connector through its opening in the bottom case, then lower the motherboard into place.

- Make sure the hard drive guide's forward screw lug lies on top of the motherboard and beneath the screw lug on the audio/PCMCIA panel.

- Make sure the audio-out jack, external microphone jack, and PC Card eject button fit through their openings in the audio/PCMCIA panel.

- **Mini-PCI models only:** route the cables from the mini-PCI panel to avoid interfering with installation or operation of other components (see Figure 2-12 on page 2-15).

Replacing the Motherboard

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

1. **Mini-PCI models only:** release the latches at the sides of the card, so that its free edge pops up, and carefully pull the card out of its connector.

2. **Mini-PCI models only:** disconnect the cables that connect the mini-PCI panel to the motherboard, and remove the panel and the mini-PCI card (still connected) from the motherboard.

3. Disconnect and remove the backup battery. If the connector does not release easily, try gently pressing down on the rear of the connector (near the wires) as you pull it out.
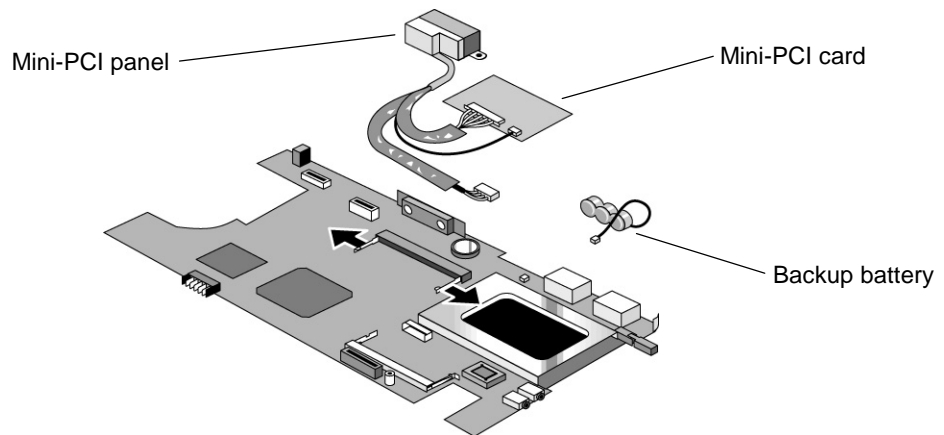
Figure 2-20. Removing Motherboard Components

Reassembly Note

- Reinstall the motherboard in the unit following the "Reassembly Notes" on page 2-26.

Note: After Replacing the Motherboard

After replacing the motherboard, you must use the Service Utility floppy disk to store the system data and display information in the EEPROM on the new motherboard.

1. Connect a floppy disk drive to the computer using a USB floppy cable, or dock the computer and insert a floppy drive module into the expansion base.

2. Plug in an AC adapter.

3. Insert the Service Utilities floppy disk in the floppy drive.

4. Turn on the computer.

5. If you hear 5 beeps, press F1 to update the display data stored on the motherboard. Let the computer reboot and go to the next step.

6. Select the Serial Number option from the boot menu.

7. If you successfully stored system data on the floppy disk before removing the old motherboard, type A for the automatic update. This restores the old system data on the new motherboard.

   If you did not store system data, type M for the manual update option. Enter the serial number from the bottom of the unit—you may have to contact an HP support center to do this.

Replacing the Bottom Case

Important

Due to contractual restrictions imposed by Microsoft, an HP authorized service provider must follow special procedures when replacing the bottom case. These restrictions affect the distribution, handling, and tracking of new, replacement, and replaced Microsoft Certificate of Authenticity labels attached to the bottom case of the computer. Contact the HP Call Center in your region for information or see service note 500-03.

Important

If the notebook is an option code ARE (for Malaysia), the bottom case can be replaced only by the regional repair center in Taiwan. This requires sending the entire unit to the repair center. Contact the HP Call Center in your region for shipping information.

Required Equipment

- #0 Phillips screwdriver.

Removal Procedure

1. Remove both screws from the speaker assembly and remove the speaker assembly from the unit.

2. Remove the three remaining screws from the hard drive/LED flex cable, then lift the cable off of its connector and out of the unit.

3. Remove the screw from the hard drive guide, and remove the guide.

Screws, M2×3mm (3)

Screws, M2×5mm (2)

Screw, M2×2mm
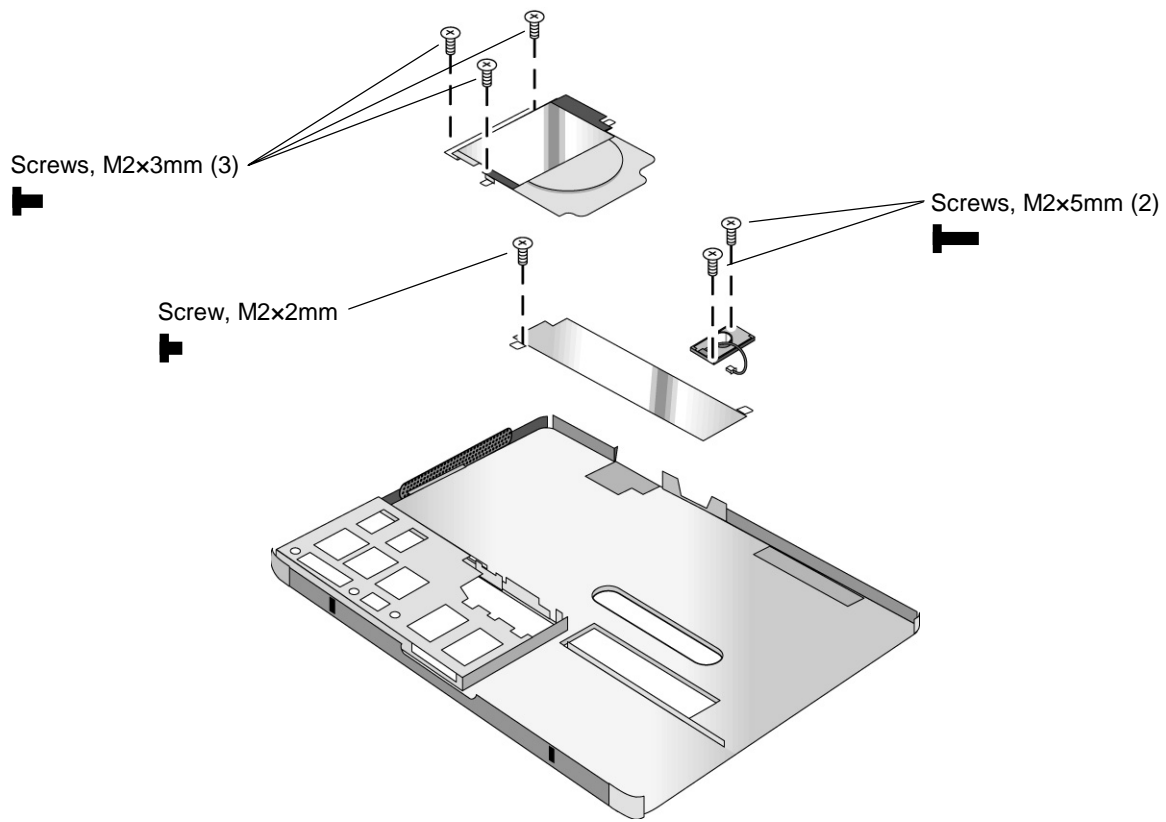
Figure 2-21. Removing Bottom Case Components

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. Restore the labels on the bottom case, as follows:

   • If the notebook includes a hardware modem mini-PCI card, attach the hardware modem telecom regulatory label.

   • If the notebook includes a LAN/modem mini-PCI card, attach the LAN/modem telecom regulatory label.

   • If the notebook is an option code AB2 (for China) or ACQ (for South Africa), add the appropriate sticker included in the telecom sticker set.

4. Reinstall the bottom case in the unit following the "Reassembly Notes" on page 2-26.

Reassembly Notes

- Be careful not to trap the speaker gasket beneath the heads of the retaining screws. Also, reinstallation may be easier if you first position the speaker grill in the bottom case, then set the speaker in place.

- To replace the docking doors, proceed as follows:

  1. Insert a flat-blade screwdriver between the doors, toward the right end of the doors (farthest from the speaker), and carefully bend one of the doors upward.
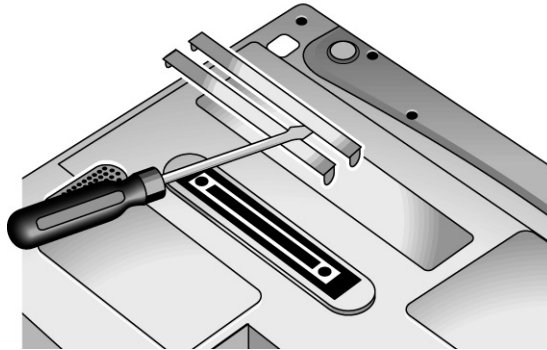
Figure 2-22. Replacing the Docking Doors

  2. Grasp the door with one hand, and with the other hand take the right end of the door off of its pivot pin.

  3. Repeat step 2 for the remaining door.

  4. Take the left ends of both doors off of their pivot pins.

  5. When installing the new doors, insert the spring end of the doors first, and be careful not to catch the spring on the pivot pins.

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

1. Open a new document based on the serial label template.

2. Enter the information from the old serial label, and print the new label on plain white paper. The new label does not have barcodes.

3. Carefully cut out the new serial label just inside the border and place it into the inner recess in the bottom case. The bottom of the label goes toward the front of the case.

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

HP Serial Number (S)TW711A1234   1YR
(1P) F2072 W   EA   MFG# TW711A1234
Made in Taiwan
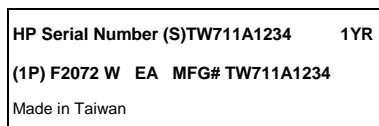
Figure 2-23. Example of Serial Number Label

Repairing the BIOS IC
(HP Authorized Service Providers Only)

The BIOS IC of the Omnibook 500 is not replaceable:

- If the BIOS IC is defective, you must replace the motherboard.

- However, if the BIOS IC might only be corrupted, you can attempt to repair it using a Crisis Recovery floppy disk—see below.

Note: Reprogramming the BIOS IC

A new BIOS IC contains only enough basic programming to boot the Omnibook. After installing a new motherboard, 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 disk.

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. Dock the computer, and plug in an AC adapter.

2. Connect a floppy disk drive to the computer using a USB floppy cable, or dock the computer and insert a floppy drive module into the expansion base.

3. Insert the BIOS Crisis Recovery floppy in the floppy drive.

4. Turn on the computer. When the HP logo appears, press ESC to display the boot menu, then boot from the floppy disk.

   If the computer does not turn on at all, boot from the floppy disk as follows:

   - Unplug the AC adapter.

   - Press and hold Fn+B.

   - Plug in the AC adapter.

   - Release Fn+B.

5. If the computer does not boot from the BIOS Crisis Recovery floppy, try plugging the boot-block jumper into the expansion base 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.)

6. 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.

7. Make sure the BIOS is the latest version. (You can check this in the Main menu of BIOS Setup, or in the BIOS menu of Windows e-DiagTools.) If necessary, reprogram the BIOS IC—see the note at the beginning of this topic.
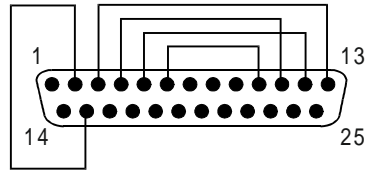
Figure 2-24. Boot-Block Jumper

Removing Omnibook Components
(HP Authorized Service Providers Only)

Required Equipment

- #0 Phillips screwdriver.

- Small flat-blade screwdriver.

Removal Procedure

1. Unplug the AC adapter, if present, and remove the battery.

2. Remove the assemblies and follow the additional steps given in the table below.

Table 2-8. Removing Omnibook Components

Component	Removal Procedure	Additional Steps
Battery, backup	Power button panel (page 2-9). Keyboard (page 2-10). Switchboard PCA (page 2-15). Display (page 2-18). Top case (page 2-23).	Disconnect the cable from the motherboard. If the connector does not release easily, try gently pressing down on the rear of the connector (near the wires) as you pull it out.
Battery, CMOS	Power button panel (page 2-9). Switchboard PCA (page 2-15).	**Reassembly Note:** After replacing the CMOS battery, set the correct time and date using the BIOS Setup utility or Date/Time in the Control Panel.
Cable, HDD/LED flex	Hard disk drive (page 2-6). Power button panel (page 2-9). Keyboard (page 2-10). Switchboard PCA (page 2-15). Display (page 2-18). Top case (page 2-23).	Remove the four screws from the cable, then lift the cable off of its connector and out of the unit.
Case, bottom	See page 2-25.	
Case, top	See page 2-23.	
Display	See page 2-18.	
Doors, docking	See page 2-31.	
Guide, hard drive	Hard disk drive (page 2-6). Power button panel (page 2-9). Keyboard (page 2-10). Switchboard PCA (page 2-15). Display (page 2-18). Top case (page 2-23).	Remove both screws from the guide, and remove it from the unit. **Reassembly Note:** Make sure the guide's screw lug lies on top of the motherboard and beneath the screw lug on the audio/PCMCIA panel.

Component	Removal Procedure	Additional Steps
Heatsink/fan	See page 2-21.	
Panel, audio/PCMCIA	Hard disk drive (page 2-6). Power button panel (page 2-9). Keyboard (page 2-10). Switchboard PCA (page 2-15). Display (page 2-18). Top case (page 2-23).	Remove all three screws from the panel. Flip out the PC Card eject button, so that it stands out from the side of the unit, then remove the panel. **Reassembly Notes:** Make sure the audio-out jack, external microphone jack, and PC Card eject button fit through their openings in the panel. Make sure the forward screw lug on the panel lies on top of the screw lug on the hard disk guide.
Panel, mini-PCI	Hard disk drive (page 2-6). Power button panel (page 2-9). Keyboard (page 2-10). Switchboard PCA (page 2-15). Display (page 2-18). Top case (page 2-23).	**Reassembly Notes: Mini-PCI models only.** Route the panel's cable (modem models) or cables (LAN/modem models) to avoid interfering with installation or operation of other components (see Figure 2-12 on page 2-15). Make sure the cable or cables are not trapped beneath the mini-PCI card or heatsink and do not lay across the heatsink.
PCA, motherboard	See page 2-25.	
Plate, EMI (certain models only)	Hard disk drive (page 2-6). Power button panel (page 2-9). Keyboard (page 2-10). Switchboard PCA (page 2-15). Display (page 2-18). Top case (page 2-23). Heatsink/fan (page 2-21).	Remove the retaining screw, and lift the EMI plate out of the unit.
Speaker	Power button panel (page 2-9). Keyboard (page 2-10).	Remove both retaining screws, and disconnect the speaker cable from the motherboard. **Reassembly Notes:** It may be easier to set the speaker grill in position first, then set the speaker in place. Be careful not to trap the speaker gasket beneath the heads of the retaining screws.

3

Troubleshooting and Diagnostics

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

- Troubleshooting information
  - □ Checking for customer abuse (page 3-3).
  - □ Troubleshooting the problem (page 3-2).
  - □ Verifying the repair (page 3-4).
  - □ Suggestions for troubleshooting (page 3-5).
- Diagnostic tools
  - □ Omnibook e-DiagTools diagnostic program (page 3-19).
  - □ Power-on self-test (page 3-26).
  - □ Sycard PCCtest 450 PC Card (page 3-29).
  - □ Desktop Management Interface (page 3-30).
  - □ BIOS Setup utility (page 3-31).

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.

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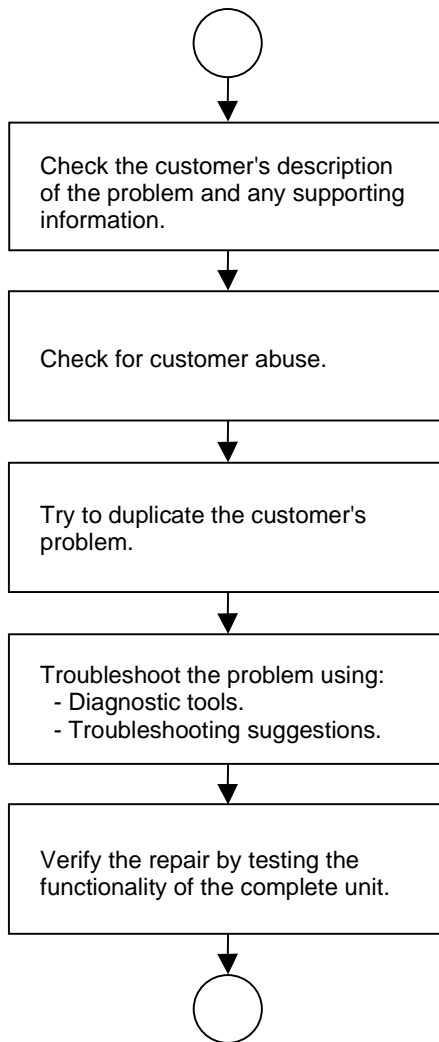
Figure 3-1. Basic Troubleshooting Steps

Checking for Customer Abuse

Some units may appear to have been damaged by customer abuse. Use these guidelines to help determine if this is the case:

- If the shipping box is seriously damaged, customer abuse *cannot* be declared.

- If the damage *could have* a cause other than customer abuse, customer abuse *cannot* be declared.

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

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

Important
Parts damaged by customer abuse are not covered by the warranty.

Troubleshooting the Problem

Record pertinent information about the unit:

- Model and serial number.

- Operating system and version.

- Software version (hidden file c:\version.inf).

- BIOS version.

- Accessories and peripherals used.

Analyze the problem:

- **Observe Symptoms.** Using the customer's information, try to duplicate the problem. Determine how the problem differs from proper behavior. Also, 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 e-DiagTools diagnostic program tests most of the computer's components using automatic and interactive tests, and will be your primary troubleshooting tool. Other tools include the power-on self-test, DMI/Toptools (if installed), the BIOS Setup utility, and the Sycard PCCtest. Table 3-1 on page 3-5 shows how you can use these tools to isolate the cause of the computer's problem.

  □ The troubleshooting suggestions on page 3-6 include general suggestions for repairing units with specific failure symptoms.

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

After you replace a component, 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:

- **e-DiagTools Basic Diagnostic Test.** Run the basic test of the e-DiagTools diagnostic program (page 3-19).

  – and –

- **Function Tests.** Run tests that check the repaired function, such as in the e-DiagTools diagnostic program (page 3-19).

  – and –

- **Failed Tests.** Run any other tests that failed during troubleshooting.

Suggestions for Troubleshooting

Table 3-1. Scope of Diagnostic Tools

Function	e-DiagTools	Power-On Self-Test	Sycard PCCtest 450	DMI/Toptools (if installed)	BIOS Setup
Bootup		Tests		Describes	Configures
Processor	Tests (System menu)	Tests		Describes	
Memory	Tests (Memory menu)	Tests		Describes	Describes
Batteries		Tests (CMOS battery only)		Describes (Win 98 only)	
Display	Tests (Video menu)			Describes	
Hard disk	Tests (IDE menu)	Tests		Describes	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)				
Serial	Tests* † (Misc menu)			Describes	Configures
Parallel	Tests* † (Misc menu)			Describes	Configures
LAN				Describes	
Modem	Tests** (User menu)				
Wireless					
Infrared				Describes	Configures
PS/2 port	Tests† (KBD, Misc menus)				
USB	Tests† (USB menu)			Describes	Configures
Docking port	Tests (System menu, using docks)				
PCMCIA	Tests* † (Misc menu)		Tests	Describes (Win 98 only)	
AC adapter				Status	
Expansion base	Tests ports, CD controls, and internal bus			Status	Configures
Plug-in modules				Describes	

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

** 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 (such as the expansion base) 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, find out which replaceable components are involved in the system involved, and what roles they play. See Figure 1-11 on page 1-19 and Table 1-9 on page 1-20.			
Startup			
Does not boot on AC or battery.	Check the power source. Press the system-off switch to reset the computer. Unplug the AC adapter and remove all batteries, then reconnect power. Remove any SDRAM expansion module and try again.	AC adapter. SDRAM module. Motherboard. Display assembly. Hard drive.	Check the AC adapter. Remove any SDRAM expansion module and try again. Replace the system SDRAM module. If the power mode light does not turn on, reprogram the BIOS; replace the motherboard. If the power mode light turns on but the display does not, try an external monitor. If the monitor shows a successful boot, replace the display assembly. If the monitor shows activity but the BIOS does not complete, replace the display assembly. If the monitor is blank, replace the motherboard. If the power mode light and display turn on and the BIOS completes, but the OS will not start from the hard disk or from a floppy drive, replace the motherboard. If the OS starts only from a floppy drive, reinstall the factory software onto the hard drive; replace the 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 main battery, but boots on AC.	Check the battery level using the battery LEDs. Check battery contacts. If available, try another battery.	Battery or contacts. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Does not boot from a floppy drive.	Make sure the floppy disk is bootable. Make sure the floppy drive is installed or connected correctly. If the floppy drive is connected to a USB port, make sure Legacy USB Support is enabled in BIOS Setup. Use BIOS Setup to check the boot order and to make sure that floppy boot is enabled. If the drive is installed in the expansion base, try connecting it to a USB port, or vice versa.	Floppy drive or contacts. Floppy drive cable. Expansion base. Motherboard.	
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 e-DiagTools diagnostics.	CD/DVD drive module. Motherboard. Expansion base.	
Error message such as "Invalid system disk" or "Auto IDE error".	Check for a disk in the floppy drive. Check the boot order in BIOS Setup. Remove and reinsert the hard drive.	Hard drive contacts. Hard drive.	If the unit boots from the floppy drive, check for corrupt files on the hard drive; reinstall the factory software onto the hard drive; replace the hard drive.
Sluggish startup or shutdown.	Run ScanDisk and Disk Defragmenter to check and optimize the hard drive. Delete temporary and unneeded files.	Hard drive.	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.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Power/Battery			
Short battery operating time.	Turn down the display brightness. Check power management settings in BIOS Setup. Try the default settings. Restart the computer, press F6 when the HP logo appears, and follow the instructions that appear onscreen. This process calibrates the main battery and any secondary battery in the expansion base's left module bay, and requires four to five hours per battery. You cannot use the computer during this process. Some applications can use excess power. (Users can get the Intel Power Monitor from www.intel.com and monitor CPU load.) PCMCIA cards can affect battery life. Some 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.
Turns off immediately after turning on.	Battery may be extremely low. Plug in the AC adapter, insert a charged battery (if undocked), or plug in a secondary battery (if docked).	Battery.	
Does not run on battery; empty battery indication.	Check the battery and contacts. If one is available, try another battery.	Battery or contacts. Motherboard.	
Beeps repeatedly.	The computer beeps repeatedly when the battery is low. Save your work immediately, shut down Windows, and insert a charged battery or plug in the AC adapter.	Battery.	
Computer stops while swapping main battery in Standby mode.	Disable device settings that use extra power during Standby (for example, turn off Windows 2000 Wake On LAN option). Shut down or plug in AC adapter before swapping. Plug in AC adapter and allow to stand overnight to recharge backup battery. Unplug any USB devices.	Backup battery.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Main battery does not charge.	Check the power source. Make sure the main battery is installed properly. Check the battery contacts. If available, try another battery and AC adapter. Move the computer away from any heat source. Unplug the AC adapter and let the battery cool down. Check for blocked air vents.	Battery or contacts. AC adapter. Motherboard. Heatsink/fan.	Check the main battery and AC adapter. Check the heatsink/fan.
Secondary battery module does not charge.	Make sure the main battery is fully charged. If not, the secondary battery will not charge. Check the power source. Make sure the secondary battery is installed properly.	Secondary battery module. Expansion base.	Check the secondary battery and AC adapter.
Time Remaining indicator is inaccurate.	The Time Remaining is an estimate based on how much power the computer is using at the moment. The estimate 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 the display brightness. Press Fn+F5 several times. Try an external monitor. If the display is extremely cold, it will show completely dark. If this happens, allow the computer to gradually warm to room temperature.	Display cable connection. Display assembly. Motherboard.	Reprogram the EEPROM—see page 2-20. 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. Motherboard.	
Erratic display.		Display cable connection. Display assembly. Motherboard.	Check the display cable connection.
Bright or missing pixels or lines.	See quality statement on page 5-2.	Display cable connection. Display assembly.	Check the display cable connection. See the quality statement on page 5-2.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Punctured display.			Declared to be caused by customer abuse.
Vertical crack near center of display.		Usually caused by closing display with pencil-sized object on keyboard.	Declared to be caused by customer abuse.
Scratched display glass.			Declared to be caused by customer abuse.
Local area of dark or light discoloration visible when display is on.		Caused by excessive pressure applied to an area on the screen.	Declared to be caused by customer abuse.
Hard disk			
Hard disk doesn't spin.	Check the power source. Remove and reinsert the hard drive. Use a flashlight to check the connector.	Hard drive/LED flex cable. Hard drive. 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 motherboard.	Depends on the source of the noise.	
Files are corrupted.	Run the VirusScan program. Check the disk surface by running Scandisk (Windows 98) or using the Tools tab in the disk's Properties sheet (Windows 2000). Test the hard disk drive with the e-DiagTools diagnostics. Use the *Recovery CD* to restore the factory software.		Use the suggestions shown at left.
Drive capacity is less than normal.	Check the disk surface by running Scandisk (Windows 98) or using the Tools tab in the disk's Properties sheet (Windows 2000). Check partitions using FDISK (Windows 98) or Control Panel, Administrative Tools, Computer Management under Storage (Windows 2000).	Hard drive.	Use the suggestions shown at left. Recreate the Utility partition, then partition and format the disk.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
CD-ROM/DVD drive			
Cannot read a CD or DVD.	Make sure the CD/DVD is clean and inserted properly. Make sure the drive module is inserted properly. Restart the computer. Reset the expansion base.	CD/DVD drive module.	
Region Code error when playing a DVD.	DVDs can contain embedded regional codes that prevent them from playing outside the region in which they are sold. This error indicates you are trying to play a DVD intended for a different region.		
General problems.	Make sure the drive module is installed or connected correctly. Restart the computer. Reset the expansion base.	CD/DVD drive module. Expansion base. Motherboard.	
Floppy drive			
General problems.	Make sure the drive module is installed or connected correctly. If the drive is installed in the expansion base, try connecting it to a USB port, or vice versa. Check the settings in BIOS Setup.	Floppy drive module. Floppy drive cable. Expansion base. Motherboard.	
Keyboard and pointing stick			
Some or all keys do not work properly.	Check the settings in BIOS Setup.	Keyboard. Motherboard.	Try reconnecting the keyboard and pointing stick flex cables.
PS/2 keyboard and mouse do not work.	Check the devices separately. Suspend or shut down the computer before attaching the device, so that it will be detected properly. Test the keyboard and pointing stick with the e-DiagTools diagnostics.	PS/2 device. Expansion base. Motherboard.	
Pointing stick doesn't work.	Make sure the pointing stick is enabled in BIOS Setup and in Mouse Properties in Control Panel. Restart the computer.	Keyboard. Motherboard.	Check the keyboard and pointing stick flex cable connections.
General problems.	Suspend and resume operation using the blue sleep button. Slide and hold the power button four seconds to reset the computer.	Keyboard. Motherboard.	Check the keyboard and pointing stick flex cable connections.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Memory			
Out of memory message appears.	Delete temporary and unneeded files on drive C. If using third-party SDRAM module, check HP Notebook web site to see if the module has been tested for use with this computer. Test the memory with the e-DiagTools diagnostics.	SDRAM module. Motherboard.	
Memory doesn't increase after adding SDRAM.	Use only PC-100 SDRAM modules.	SDRAM module.	
Click/scroll button			
General problems.	Check the pointing stick settings in Control Panel. Slide and hold the power button four seconds to reset the computer.	Top case. Motherboard.	
Audio			
No sound is audible.	Increase the sound volume (Fn+UP ARROW, volume control, and software controls). Make sure sound is enabled (audio-off button and software controls). Check for sound resource conflicts in Device Manager.	Top case. Motherboard.	Check operation using headphones or external speakers.
Sound does not record.	Check the settings in BIOS Setup and software controls. Test the audio with e-DiagTools diagnostics.	Top case. Motherboard.	Check operation using an external microphone.
Feedback from speakers.	Reduce the volume. In the Volume Control, click Options, Properties, and select the microphone option for the playback settings. Make sure the microphone is muted.		
Serial/Parallel			
General problems.	Check connections. Check settings in BIOS Setup and Control Panel. Test ports with the e-DiagTools diagnostics.	Motherboard. Expansion base.	Use a loop-back connector when testing the serial or parallel port—see page 3-21.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
USB			
General problems.	Check connections. Try one device at a time. Check settings in BIOS Setup and Control Panel. Test ports with the e-DiagTools diagnostics. Check for latest versions of drivers. If the device is powered by the USB port, try different ports: if the device works in all but one port, replace the module containing that port.	Motherboard. Expansion base.	Use a loop-back connector when testing the serial or parallel port—see page 3-21.
Modem			
General problems.	Check all cables and connections. If possible, connect directly to a wall jack. Check line quality. In Control Panel, open Modems (Windows 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, not a 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 all cables and connections. Try connecting a different computer to the cable. Check settings in BIOS Setup and 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 LAN diagnostic software—click Start, Run, then click Browse, and select the file C:\HP\DRIVERS \LAN\WINDIAG\SETUP.EXE.	Mini-PCI card. Mini-PCI panel. Motherboard.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Infrared			
General problems.	Check installation: when shipped, infrared is disabled and no drivers are installed. (Drivers are included with notebook.) Check settings in BIOS Setup. Remove any PC Card from notebook (possible IRQ conflict). For fast IrDA, check for DMA conflict with ECP parallel port.	Motherboard.	
Wireless			
General problems.	Check TCP/IP setup in Control Panel. For Windows 98: try disabling DNS in TCP/IP setup. Check SSID and channel settings: click wireless link icon in taskbar and select Advanced Configuration. Stop USB devices that may perform large data transfers, or adjust application settings to reduce transfer rate. Make sure wireless cable is properly connected to switchboard PCA, and that switchboard PCA is installed properly.	Display assembly. Motherboard. Switchboard PCA.	

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
PCMCIA			
General problems.	Restart the computer. Remove and reinsert the PC Card. If the card requires an IRQ, make sure one is available. Check settings in Control Panel. Check for conflicts or refresh the device list in Device Manager. Check the HP Notebook web site for installation instructions (page vi), and to make sure the computer supports the problem card. 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. Test the PC Card with the e-DiagTools diagnostics.	Motherboard.	Using a flashlight, look for bent pins inside the PCMCIA socket.
AC adapter			
Does not power the computer.	Try another AC adapter, if available.	AC adapter. Motherboard.	The AC adapter cannot be repaired, and must be replaced if defective.
Motherboard			
Evidence of spilled liquid.			Declared to be caused by customer abuse.
Bent or broken connectors, or burnt component.			Declared to be caused by customer abuse.
Motherboard cracked.			Declared to be caused by customer abuse.
Miscellaneous			
Clock loses time.	Plug in the AC adapter for 24 hours to charge the CMOS battery.	CMOS battery. Motherboard.	Charge the 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/fan.	Check the heatsink/fan for proper fan operation or 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 disk activity light) while the computer is paused or running slowly, consider installing additional SDRAM. Check the amount of available free disk space. Delete temporary and unneeded files. Run BIOS Setup and set the Power Management Mode to Max. Performance. Run BIOS Setup and turn off Intel SpeedStep Mode.	Motherboard.	If the computer slows after a period of continuous activity, see the previous symptom.
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 system-off switch to reset the computer.		

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Does not suspend to Standby mode as expected.	The computer won't suspend if it has an active connection to another computer. If the computer is busy, it normally waits to finish the current operation before suspending.		
Does not automatically enter Hibernate mode as expected.	For Windows 2000, make sure hibernate support is enabled in Power in Control Panel. Also, make sure the Hibernate timeouts (Power Schemes tab) for AC and battery power are not set to Never. For Windows 98, check the Hibernate timeout in BIOS Setup. If the computer has more than 512 MB of SDRAM, the Utility partition on the hard disk must be expanded.		
Standby option missing from Shut Down window.	Do not allow Windows 98 to disable APM. If it prompts you to do so, answer No. In System in Control Panel, expand System Devices (System Manager tab), and remove Advanced Power Management. Restart the computer, then use Add New Hardware in Control Panel to install support for APM. Restart the computer.		
Plug-in Modules			
General problems.	Make sure module is installed properly. Reset computer and the expansion base.	Plug-in module or contacts. Motherboard. Expansion base.	Plug-in modules cannot be repaired, and must be exchanged.

Symptom	Call Center: Suggestions	Repair Center: Likely Causes	Repair Center: Comments
Expansion base			
Computer won't undock or gets stuck.	Use the emergency undock latch. Test the expansion base with e-DiagTools diagnostics.	Expansion base.	
Port on expansion base isn't working.	Make sure the computer is docked properly. Reset the computer and the expansion base.	Expansion base. Motherboard.	
Computer does not respond to undock switch or Eject command.	Check power sources. Use the emergency undock latch. If the computer is not fully docked, use the emergency undock latch. Reset the computer and the expansion base. Test the expansion base with e-DiagTools diagnostics.	Expansion base. Motherboard.	
Floppy drive connected to the parallel port doesn't work.	Make sure there is only one floppy drive in the system. Use only the HP F2008A parallel floppy cable. If the computer is not fully docked, use the emergency undock latch. For Windows 98, notify BayManager before connecting or disconnecting the parallel floppy drive.	Floppy drive module. Expansion base.	
General CD player or status panel problems.	Check the power source. Reset the expansion base. Check the HP Notebook web site for an expansion base BIOS update.	Expansion base.	
General problems.	Check power sources. Make sure the computer is docked properly. Check the HP Notebook web site for an expansion base BIOS update.	Expansion base. Motherboard.	

Diagnostic Tools

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

- e-DiagTools program (below).
- Power-on self-test (page 3-26).
- Sycard PCCtest 450 PC Card (page 3-29).
- Desktop Management Interface (page 3-30).
- BIOS Setup utility (page 3-31).

e-DiagTools

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

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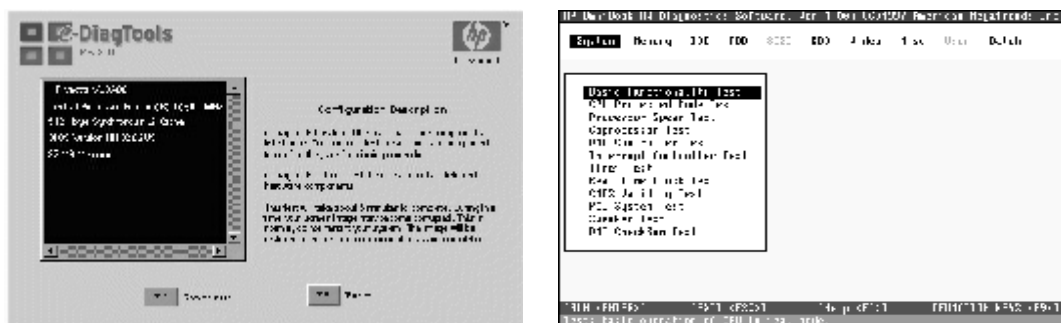
Figure 3-2. e-DiagTools Screens — Basic and Advanced

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

Updating e-DiagTools

You can download the latest version of e-DiagTools from the HP Notebook web site (see page vi), then install it following the accompanying instructions.

Running e-DiagTools

1. Restart the computer.

2. When the HP logo appears, press F10 to start the diagnostic test.

3. When the menu appears, press ENTER to run e-DiagTools.

4. The first time you run the program, you are prompted to select the language for the program.

5. Press F2 to proceed with the basic tests.

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

6. When the Configuration Description appears, check the list of detected hardware.

Note

If a device is not detected or fails its test, it might be configured incorrectly in BIOS Setup. You can confirm this by running BIOS Setup and checking the settings—see "BIOS Setup Utility" on page 3-31.

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

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

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

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

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

    If a test fails, the error code and description are logged, and the error code is displayed temporarily. If several errors occur, look for patterns that might indicate a common cause. See Table 3-3 on page 3-22 for repair suggestions. Consider these suggestions in combination with other troubleshooting information.

11. **Save the Support Ticket.** Press T to update and display a Support Ticket containing system and test information.

12. When you are finished running tests, press ESC to exit the advanced tests.

13. **Optional:** To save the Support Ticket to a floppy disk, press F7 then ALT+C.

14. **Exit.** Press F3 and then any key to exit and reboot.

15. **Optional: Open the Support Ticket.** In Windows, click Start, Programs, HP e-DiagTools, e-DiagTools for Windows.

16. Click View to display the Support Ticket.

17. To add information about the problem, click Comments and type the information, then click OK.

    To save or print the Support Ticket, click Save As or Print.

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

These connections are not used.

Diodes are 1N4004 or equivalent (I_F=1A, V_F=1V@1A, V_R=30-400V)
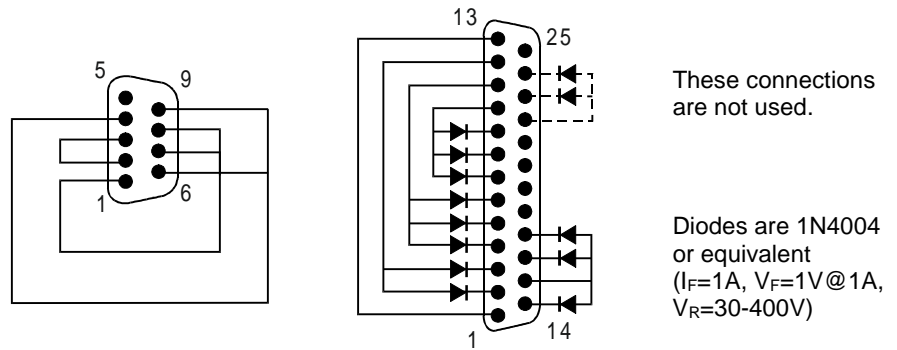
Figure 3-3. Serial and Parallel Loopback Connectors

Interpreting the Results

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

Table 3-3. e-DiagTools Error Codes

Code	Suggestions
Note: If the BIOS IC appears to be corrupted, you can try to repair it (see page 2-31).	
System Tests	
0001h – 0040h	Replace the motherboard.
0041h	Run BIOS Setup and check IRQ assignments for all devices.
0050h – 0063h	Replace the motherboard.
0070h	Replace the CMOS battery.
0071h – 0076h	Reset the system, then run BIOS Setup and check settings. Replace the CMOS battery. Replace the motherboard.
0077h	Replace the motherboard.
0078h	Reset the system, then run BIOS Setup and check settings. Replace the CMOS battery. Replace the motherboard.
0079h	Replace the CMOS battery. Replace the motherboard.
0083h – 008Ah	Reprogram the BIOS IC. Replace the motherboard.
00C0h – 00CCh	Replace the motherboard.
Memory Tests	
The addresses below are absolute (32-bit) addresses, and are not in the segment:offset format.	
0100h – 0101h	Replace the motherboard.
0102h	Reprogram the BIOS IC. Replace the motherboard.
0120h – 0131h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
0132h – 0150h	Replace the SDRAM module (each 01000000h represents 16 MB).
0160h	Remove all but one SDRAM module and repeat the test. Replace the motherboard.
0170h – 0172h	Replace the motherboard.
0180h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
0181h	Replace the motherboard.
0182h	Make sure you have the latest version of e-DiagTools, and repeat the test. Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
0183h – 0184h	Check the installation of the SDRAM module. Replace the SDRAM module. Replace the motherboard.
0190h – 01A0h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.

Code	Suggestions
01A1h – 01A5h	Replace the motherboard.
01B0h – 01B2h	Replace the SDRAM module (each 01000000h represents 16 MB). Replace the motherboard.
01B3h	Replace the motherboard.
Hard Disk Tests	
0201h	Replace the hard disk. Replace the motherboard.
0202h – 0204h	Check test parameters and repeat the test. Replace the hard disk.
0205h	Replace the motherboard.
0207h	Use BIOS Setup to check the hard disk type. Check the hard disk installation. Replace the hard drive/LED flex cable. Replace the hard disk. Replace the motherboard.
0208h – 0209h	Transient DMA error. Repeat the test.
020Ah – 0211h	Repeat the test. Run SCANDISK or an equivalent.
0220h	Replace the motherboard.
0240h	Replace the hard disk. Replace motherboard.
0252h – 0254h	Check test parameters and repeat the test. Replace the hard disk.
025Ah – 0260h	Repeat the test. Run SCANDISK or an equivalent. Replace the hard disk.
0265h	Check the hard disk installation. Replace the hard drive/LED flex cable. Replace the hard disk. Replace the motherboard.
0275h	Replace the hard disk.
0280h	Check the hard disk installation. Replace the hard drive/LED flex cable. Replace the hard disk. Replace the motherboard.
0281h	Replace the hard disk.
0290h	Repeat the test. Replace the hard disk.
0293h – 0296h	Replace the hard disk.
02AAh	Check the hard disk installation. Replace the hard drive/LED flex cable. Replace the hard disk. Replace the motherboard.
02CCh	Use BIOS Setup to check the hard disk type. Check test parameters and repeat the test. 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	Use a Recovery CD to restore the original factory configuration.

Code	Suggestions
02F3h – 02F5h	Run SCANDISK or an equivalent. Use a Recovery CD to restore the original factory configuration.
02FFh	Check the hard disk installation. Replace the hard drive/LED flex cable. Replace the hard disk. Replace the motherboard.
9602h – 9607h	(See the Hard Disk Tests at the end of the table.)
Floppy Disk Tests	
0301h – 0304h	Check the USB cable (if any). Replace the floppy drive. Replace the motherboard.
0305h	Make sure the floppy disk is fully inserted in the drive. Make sure the drive is properly installed or connected. Replace the disk. Check the USB cable (if any). Replace the floppy drive. Run the Floppy Disk Controller test. Replace the motherboard.
0306h	Check the USB cable (if any). Replace the floppy drive.
0307h – 030Bh	Make sure the floppy disk is fully inserted in the drive. Make sure the drive is properly installed or connected. Replace the disk. Check the USB cable (if any). Replace the floppy drive. Run the Floppy Disk Controller test. Replace the motherboard.
030Ch	Replace the floppy drive.
Keyboard Tests	
0400h – 0401h	Replace the motherboard.
0410h – 0415h	Check the keyboard flex cable connection. Replace the keyboard. Replace the motherboard.
0415h	Replace the switchboard PCA. Replace the motherboard.
0416h – 0418h	Replace the keyboard. Replace the motherboard.
900Fh	Replace the keyboard. Replace the motherboard.
901Ch	Replace the switchboard PCA. Replace the motherboard.
901Dh	Replace the expansion base. Replace the motherboard.
Serial Port Tests	
0601h	For the external loopback test, make sure the loopback connector is constructed and installed properly. For the external or internal loopback test, replace the expansion base; replace the motherboard.
0602h	Replace the motherboard.
0603h	For the external loopback test, make sure the loopback connector is constructed and installed 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 constructed and installed properly. For the external or internal loopback test, replace the motherboard.

Code	Suggestions
0607h	Make sure the loopback connector is constructed and installed properly. Replace the motherboard.
0608h – 0612h	Replace the motherboard.
IR Tests (FIR enabled, undocked)	
0618h – 0619h	Make sure the machines are positioned correctly. If the problem persists, replace the motherboard.
Parallel Port Tests	
0701h	For the external loopback test, make sure the loopback connector is constructed and installed properly. For the external or internal loopback test, replace the expansion base; replace the motherboard.
0702h – 0706h	Replace the motherboard.
0707h	Make sure the loopback connector is constructed and installed properly.
0708h – 0709h	Replace the motherboard.
Audio Tests	
0801h	Check the speaker connections. Replace the top case. Replace the motherboard. If this error occurs for an external headphone, replace the motherboard.
0802h – 0804h	Check the speaker connections. Replace the top case. Replace the motherboard.
0806h	Check speaker connections and repeat the test. Replace the top case. Replace the motherboard. If testing the expansion base, make sure the computer is docked properly; repeat the test; replace the expansion base if the test fails repeatedly.
0810h – 0816h	Check speaker connections and repeat the test. Replace the top case. Replace the motherboard.
08C0h – 08C2h	Check the speaker connections. Replace the top case. If this error occurs for an external headphone, replace the motherboard.
08D0h – 08F3h	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 motherboard. If error also occurs with external monitor, replace the motherboard.
2110h – 2120h	Replace the motherboard. Replace the display assembly.
2130h	Replace the display assembly. Replace the motherboard. If this error also occurs with external monitor, replace the motherboard.
2140h – 2141h	Replace the motherboard. Replace the display assembly.

Code	Suggestions
2150h	Replace the display assembly. Replace the motherboard. If this error also occurs with external monitor, replace the motherboard.
9016h	Reset the computer. Reprogram the BIOS IC. 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 module.
0A01h	Repeat the test. Replace the CD-ROM module.
0A02h	No repair. (Automatic close not supported.)
0A03h	Insert a different CD in the drive and repeat the test. Check the installation of the CD-ROM module. Replace the drive. Replace the expansion base. Replace the motherboard.
0A04h	Insert a data CD in the drive module and repeat the test.
0A05h	Insert a different CD in the drive and repeat the test. Check the installation of the drive module. Replace the CD-ROM module. Replace the expansion base. Replace the motherboard.
0A06h	Insert a data CD in the drive and repeat the test. Replace the CD-ROM module.
0A07h	Repeat the test. Replace the CD-ROM module.
0A08h	Insert an audio CD and repeat the test. Replace the CD-ROM module.
0A09h	Repeat the test. Replace the CD-ROM module.
0A10h – 0A11h	Insert an audio CD and repeat the test. Replace the CD-ROM module.
0A12h	Insert a different multisession CD and repeat the test. Replace the CD-ROM module.
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 installation of the drive. Replace the 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 installation of the drive. Replace the drive.
0F07h	Replace the LS-120 drive.
0F08h	Insert a different disk in the LS-120 drive and repeat the test. Check the installation of the drive. Replace the drive.
0F09h	Replace the LS-120 drive.
TI CardBus Tests	
1201h	Remove any attached CardBus/PCMCIA cards and repeat the test.
1202h – 1203h	Replace the motherboard.
1205h – 1206h	Insert a different PC Card and repeat the test. Replace the motherboard.
1207h	Reset the computer. Replace the motherboard.
USB Tests	

Code	Suggestions
1301h	Reprogram the BIOS IC. Replace the motherboard.
1302h – 1316h	Replace the motherboard.
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 expansion base, if applicable).
DVD Tests	
1900h – 1904h	Insert a different DVD in the drive and repeat the test. Replace the drive.
1905h	Make sure the DVD Drive region and DVD Media region match. If the region is not set for the drive, use an unencrypted DVD.
LAN/Modem Tests	
8000h	Note: this test checks only the internal hardware up to the mini-PCI card, and does not check the mini-PCI panel or external cabling. Check the connections. Repeat the test with the LAN cable/phone line unplugged. Replace the cable/phone line. 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.
IR Tests (FIR enabled, undocked)	
9002h	Reset the notebook. Replace the motherboard.
9007h – 9008h	Reset the notebook. Run BIOS Setup and restore default settings. Replace the motherboard.
9009h	Do not run this test in Windows. For the one-unit test, replace the motherboard. For the two-unit test, make sure the IR ports on the reflector and test computers are lined up. 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 the BIOS in the computer and expansion base. Replace the expansion base.
9075h – 907Ch	Replace the expansion base.
907Eh	Update BIOS in computer and expansion base. Replace the expansion base.
907Fh	Repeat the test.
9080h	Make sure the computer is docked properly, then repeat the test.
9082h	Repeat the test with a known good computer. Replace the expansion base.
9085h	Reset the computer and expansion base, then repeat the test.

Code	Suggestions
9088h	Replace the expansion base.
Hard Disk Tests	
9602h	Failure may occur soon. Back up data and replace the hard disk.
9603h	Perform the IDE disk test (in the Advanced section). If other errors occur, follow the instructions for those errors.
9604h	Back up data if possible. Use a Recovery CD to restore the original factory configuration, then reinstall applications.
9605h – 9606h	Run the full HDD test. Use a Recovery CD to restore the original factory configuration.
9607h	Back up data, then reformat the hard disk. Replace the hard disk.
9640h	Failure may occur soon. Back up data and replace the hard disk.
9641h	Back up data if possible, and replace hard disk.

Code	Suggestions
9642h	Perform the IDE disk test (in the Advanced section). If other errors occur, follow the instructions for those errors.
9643h	Failure may occur soon. Back up data and replace the hard disk.
9644h	Back up data if possible, and replace hard disk.
9645h – 9646h	Back up data if possible, then reinstall applications. Use a Recovery CD to restore the original factory configuration.
9647h – 9648h	Make sure the hard disk is properly installed.
964Ah	The hard disk is password-protected, and so can't be tested.
964Bh – 964Ch	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 the system memory, CPU, DMA, or interrupt controller fails the POST diagnostic tests. POST progress is indicated by a sequence of codes, and error messages are displayed if possible.

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

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

1. Remove all accessories, including expansion base, external floppy drive, PC Cards, printer, external monitor, pointing device, and keyboard.

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

3. Press the system-off switch to start the computer from a known state.

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

Table 3-4. POST Terminal-Error Beep Codes

Beep Codes*	POST Description
1	One short beep before boot.
1-2	Search for option ROMs.
1-2-2-3	BIOS ROM checksum.
1-3-1-1	Test DRAM refresh.
1-3-1-3	Test NS87570 Keyboard Controller (part of the motherboard).
1-3-4-1	RAM failure on address line *xxxx*.
1-3-4-3	RAM failure on data bits *xxxx* of low byte of memory bus.
1-4-1-1	RAM failure on data bits *xxxx* of high byte of memory bus.
2-1-2-3	Check ROM copyright notice.
2-2-3-1	Test for unexpected interrupts.
1 long-2 short	Improper video configuration or external ROM checksum failure (replace the motherboard).
1 long-5 short	Display settings and EEPROM settings do not match (reprogram the 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	The hard disk is not working or is not configured properly. Make sure the disk is installed properly. Use BIOS Setup to make sure the hard disk type is correctly identified.
0210 Stuck key	A key is stuck on the keyboard.
0211 Keyboard error	The keyboard is not working.
0212 Keyboard Controller Failed	The keyboard controller failed its test. The motherboard may need to be replaced (the motherboard contains the keyboard controller).
0213 Keyboard locked – Unlock key switch	Unlock the system to proceed.
0220 Monitor type does not match CMOS – Run SETUP	The monitor type is not correctly identified in BIOS Setup.
0230 Shadow RAM Failed at offset: *nnnn*	Shadow RAM failed at offset *nnnn* of the 64k block at which the error was detected.
0231 System RAM Failed at offset: *nnnn*	System RAM failed at offset *nnnn* of in the 64k block at which the error was detected.
0232 Extended RAM Failed at offset: *nnnn*	Extended memory is not working or is not configured properly at offset *nnnn*. Update to the latest BIOS version.
0250 System battery is dead – Replace and run SETUP	The CMOS clock battery indicator shows that the battery is dead. Connect the AC adapter for at least 24 hours; replace the CMOS battery; replace the motherboard.
0251 System CMOS checksum bad – Default configuration used	System CMOS has been corrupted or modified incorrectly, perhaps by an application that changes data stored in CMOS. The BIOS installed default Setup values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the CMOS battery. Connect the AC adapter for at least 24 hours; replace the CMOS battery; replace the motherboard.
0260 System timer error	The timer test failed. Replace the motherboard.
0270 Real time clock error	The real-time clock failed the BIOS test. The motherboard may need to be replaced.
0280 Previous boot incomplete – Default configuration used	The previous POST did not complete successfully. POST loads default values and offers to run BIOS Setup. If 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	The memory size found by POST differed from CMOS.
02B0 Diskette drive A error **02B1 Diskette drive B error**	Drive A: or B: is present but fails the BIOS POST diskette tests. Make sure the drive is defined with the proper disk type in BIOS Setup, and that the drive is installed correctly.
02B2 Incorrect Drive A type – run SETUP	The type of floppy drive A: is not correctly identified in BIOS Setup.
02B3 Incorrect Drive B type – run SETUP	The type of floppy drive B: is not correctly identified in BIOS Setup.
02D0 System cache error – Cache disabled	The RAM cache failed and BIOS disabled the cache. The motherboard may need to be replaced. A disabled cache slows system performance considerably.
02F0: CPU ID:	CPU socket number for Multi-Processor error.
02F4: EISA CMOS not writeable	ServerBIOS2 test error: cannot write to EISA CMOS.
02F5: DMA Test Failed	ServerBIOS2 test error: Cannot write to extended DMA (Direct Memory Access) registers.
02F6: Software NMI Failed	ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Message	Description
02F7: Fail-Safe Timer NMI Failed	
	ServerBIOS2 test error: Fail-Safe Timer takes too long.
***device* Address Conflict**	
	Address conflict for the specified device.
Allocation Error for: *device*	
	Run the ISA or EISA Configuration Utility to resolve a resource conflict for the device.
CD ROM Drive	
	CD-ROM Drive identified.
Entering SETUP ...	
	Starting the BIOS Setup program
Failing Bits: *nnnn*	
	The hex number *nnnn* is a map of the bits at the RAM address that failed the memory test. Each 1 in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.
Fixed Disk *n*	
	Fixed disk *n* (0–3) identified.
Invalid System Configuration Data	
	Problem with NVRAM (CMOS) data.
I/O device IRQ conflict	
	An I/O device has an IRQ conflict.
PS/2 Mouse Boot Summary Screen:	
	A PS/2 mouse is installed.
***nnnn* kB Extended RAM Passed**	
	Where *nnnn* is the amount in KB of SDRAM successfully tested.
***nnnn* Cache SRAM Passed**	
	Where *nnnn* is the amount in KB of system cache successfully tested.
***nnnn* kB Shadow RAM Passed**	
	Where *nnnn* is the amount in KB of shadow RAM successfully tested.
***nnnn* kB System RAM Passed**	
	Where *nnnn* is the amount in KB of system SDRAM successfully tested.
Operating system not found	
	No operating system was found on drive A or drive C. Enter BIOS Setup and see if the hard disk and drive A: are properly identified.
Parity Check 1 *nnnn*	
	A parity error was found in the system bus. (Parity is a method for checking errors in binary data: a parity error indicates that data has been corrupted.) The BIOS displays the address if possible, and otherwise displays ????.
Parity Check 2 *nnnn*	
	A parity error was found in the I/O bus. The BIOS displays the address if possible, and otherwise displays ????.
Press <F1> to resume, <F2> to Setup, <F3> for previous	
	Displayed after any recoverable error message. Press <F1> to resume the boot process, or <F2> to enter BIOS Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an Option ROM, such as an add-on card). Write down and follow the information shown on the screen.
Press <F2> to enter Setup	
	Optional message displayed during POST.
PS/2 Mouse:	
	PS/2 mouse identified.
System BIOS shadowed	
	System BIOS was copied to shadow RAM.
UMB upper limit segment address: *nnnn*	
	Displays the address *nnnn* of the upper limit of the Upper Memory Blocks, indicating released segments of the BIOS that can be reclaimed by a virtual memory manager.
Video BIOS shadowed	
	Video BIOS was copied to shadow RAM.

Sycard PCCtest 450/460 CardBus Card (Optional)

The PCCtest 450 and 460 CardBus Cards (revision 1.05) available from Sycard Technology are the only recommended diagnostic tools that test the functionality of the PCMCIA slots using a PCMCIA card. Each is a Type II PC Card that works with compatible test software to exercise PCMCIA functions. (For details, see the Sycard Technology web site: http://www.sycard.com.)

The PCCtest product contains these components:

- PCCtest 450 or 460 (revision 1.05) PC Card.

- PCCtest 450/460 test software disk. (Software updates are available at the Sycard Technology web site: http://www.sycard.com.)

- Configuration headers (PC Card/16-bit and CardBus/32-bit) that attach to the card.

In addition, you will need this:

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

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

Table 3-6. Sycard PCCtest Commands

	PCMCIA PC Card (16-bit) test (PC Card configuration header)	CardBus (32-bit) test (CardBus configuration header)
Omnibook 500 (PCI1410)	PCT450 -0 -v -b76(b)	TESTCB -0 -v - b76(b)

Desktop and Windows Management Interfaces (DMI/WMI)

The Desktop Management Interface (Windows 98) and Windows Management Instrumentation (Windows 2000) are basically sets of rules for accessing information about a computer. DMI/WMI allows an application to determine, for example, the operating system being used, which hardware and software components are in the computer, and possibly whether any of the components need replacing. A local or remote application can use the DMI/WMI interface to check which hardware and software components are installed on your computer, and may be able to tell how well they are working or if they need replacement.

Installing the DMI Package

The DMI package is either preinstalled on the computer's hard disk or can be downloaded from http://www.hp.com/toptools (the contents are the same in both cases). The package must be properly installed before it can be used.

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

1. Start Windows, if it is not already running.

2. Click Start, Programs, HP Toptools, Setup.

Using DMI/WMI

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

- A README.TXT file: click Start, Programs, HP Toptools, Read me.

- A Windows online help file describing Hewlett-Packard's implementation of DMI/WMI (group and attribute definitions): click Start, Programs, HP Toptools, HP Toptools Help.

Uninstalling the DMI/WMI Package

1. Click Start, Programs, HP Toptools, Uninstall DMI (Windows 98) or Uninstall WMI (Windows 2000).

2. Restart 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. Restart the computer.

2. When the HP logo appears, press F2 to enter the BIOS Setup utility.

3. The pointing devices are not active in BIOS Setup, so you will need to use the keyboard to navigate:

   - Press the LEFT and RIGHT arrow keys to move among menus.

   - Press the UP and DOWN arrow keys to move among parameters in a menu.

   - Press F5 or F6 to move through values for the current parameter, or press ENTER to change a setting.

4. After you select the options you want, press F10 or use the Exit menu to exit BIOS Setup.

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

Table 3-7, below, lists the BIOS Setup menus and parameters, and the default values for each.

Table 3-7. BIOS Setup Menus and Parameters

Omnibook 500: Settings for BIOS version 2.00 (Summer 2001).		
Main Menu		**Default**
BIOS Revision	Shows the current version of the computer's BIOS (version FA.M2.00 at initial release).	Detected automatically.
Exp. Base BIOS Revision*	Shows the current version of the expansion base's BIOS (version FP.M2.00 at initial release).	Detected automatically.
System Time	Sets the time using 24-hour format. The value set takes effect immediately.	
System Date	Sets the date using mm/dd/yy format. The value set takes effect immediately.	
LCD Time format*	Sets the format for displaying time on the expansion base's status panel.	12 Hours
LCD Date format*	Sets the format for displaying the date on the expansion base's status panel.	mm/dd/yy
Floppy Drive	Sets the floppy drive type.	Detected automatically.
Internal Hard Disk	Sets the hard disk drive type and various parameters.	Detected automatically.
External Primary	Shows the hard disk drive type and capacity if one is present in the right module bay.	Detected automatically.
External Secondary	Shows the hard disk drive type and capacity if one is present in the left module bay.	Detected automatically.
Quiet Boot	When enabled, hides power-on self-test summary and messages during boot.	Enabled
Video Display Device	Sets whether the computer automatically switches to an external monitor if one is detected.	Auto
Video Expansion	When enabled, the video image covers the entire display in lower resolution modes (SVGA or VGA). When disabled, the video image is centered in the display.	Disabled
Television Type	Controls the signal format (NTSC or PAL) output by the S-video port when Windows is not running.	NTSC
System Memory	Shows the system memory size.	640 KB
Extended Memory	Shows the extended memory size (equal to total memory minus 1 MB).	Detected automatically.
CPU Serial Number	For a processor with a serial number, makes that number available to software.	Disabled
Unique Dock ID	Sets whether the computer creates a unique hardware profile for each expansion base (Enabled) or uses a common profile for all expansion bases (Disabled).	Enabled
UUID	Displays the value of the 16-byte UUID (Universally Unique ID) as 32 hex characters.	Detected automatically
* Available only when docked.		

System Devices Menu		Default
PS/2 Pointing Devices	Automatically 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 PS/2 keyboard is interpreted as the Fn key.	Enabled
FDD controller	Enables the floppy drive.	Enabled
Legacy USB Support	Enables BIOS support for USB mouse, keyboard, and floppy disk drive.	Enabled
Serial Port	Enables the serial port (the port is configured by the user).	Enabled
Base I/O address	Sets the I/O address and interrupt (appears only if the serial port is Enabled).	3F8h, IRQ4
Infrared port	Enables the infrared port (the port is configured by the user).	Disabled
Mode	Sets the port to FIR (fast IR) or SIR (standard IR) infrared communications.	FIR
Base I/O address	Sets the I/O address and interrupt.	2F8h, IRQ3
DMA channel	Sets the DMA channel for the infrared port in FIR mode.	DMA1
Parallel Port	Enables the parallel port (the port is configured by the user).	Enabled
Mode	Sets the port to output only, bi-directional, EPP, or ECP.	ECP
Base I/O address	Sets the I/O address and interrupt.	378h, IRQ7
DMA channel	Sets the DMA channel for ECP mode (appears only if the Parallel Port Mode is ECP).	DMA0
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
Password required to:		
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 98 only.)	Enabled
Undock*	Sets whether a user password is required when undocking the computer. Requires the administrator password for changes. (Windows 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.	Disabled
Removable Device Boot	Sets whether the computer will attempt to boot from a floppy drive or other removable device.	Enabled
* Available only if the Boot option is enabled.		

Power (APM) Menu		Default
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.	Auto
Power Management Mode	Disables time-outs, selects a pre-set 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 slow CPU response.	On
Suspend Time-out	Sets the period of inactivity after which the computer goes from full-power mode to Standby power mode.	4 minutes
Hibernate Time-out**	Sets the period of inactivity after which the computer goes from full-power mode or Standby mode to Hibernate mode. (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 in a 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 receives a ring signal.	Disabled
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 if Resume On Time of Day is enabled.	
Auto Suspend on Undock*	Sets whether the computer suspends to Standby 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**
+Hard Disk +Removable Device CD-ROM/DVD Drive Internal NIC	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. Internal NIC (Network Interface Card) appears in the list only if a built-in LAN is present—it provides diskless boot from a network server.	1. Hard Disk 2. Removable Device 3. CD-ROM/DVD drive 4. Internal NIC
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.	

4

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 4-6).

- Part number reference (page 4-7).

18* : 19 on some models.

21* : 22 on some models.
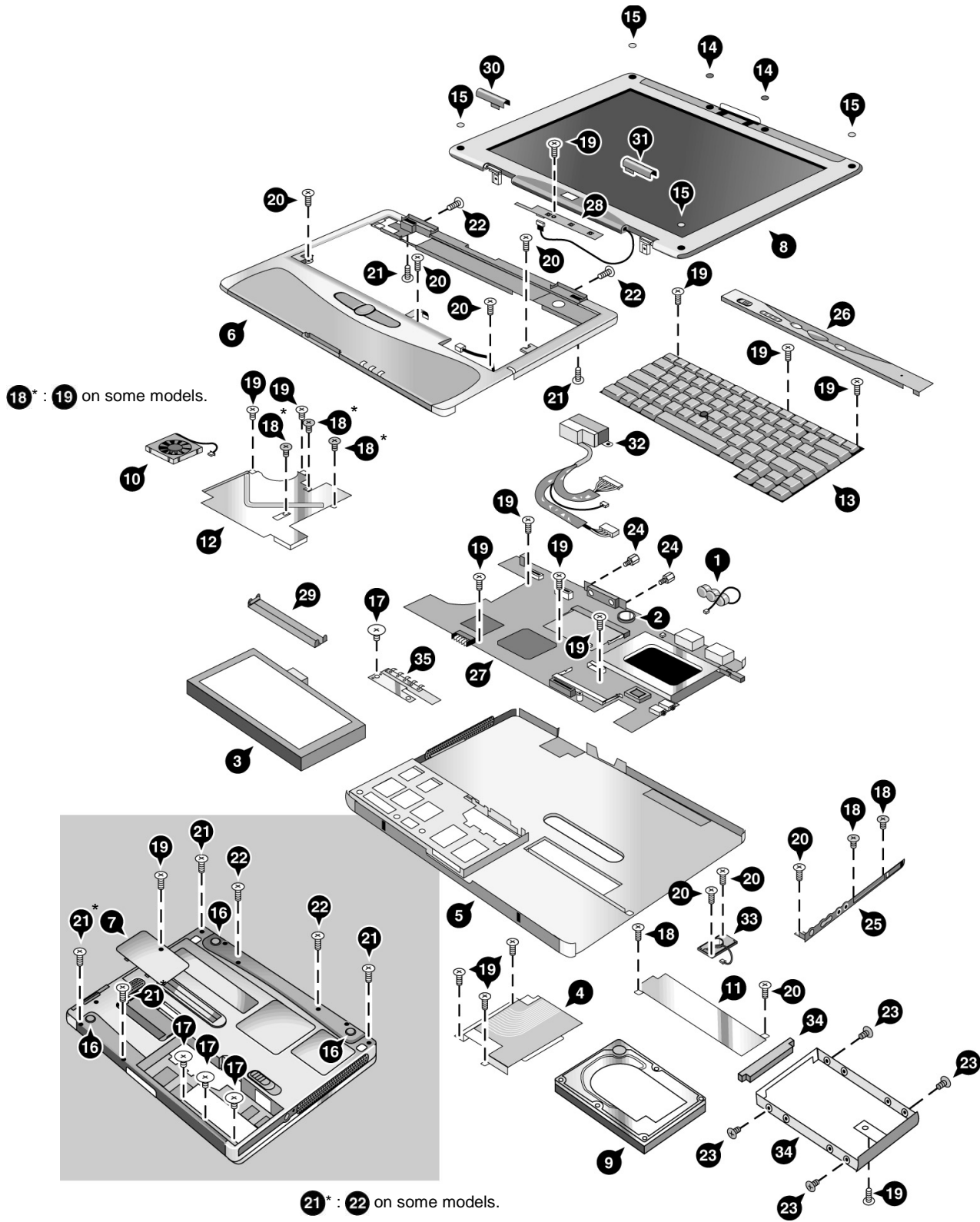
Figure 4-1. Omnibook — Exploded View

Table 4-1. Replaceable Parts

	Description	Part Number	Exchange Part Number	User-Repl.
1	Battery, backup	F2157-60932		
2	Battery, CMOS (rechargeable 3 V)	Maxell ML1220 or equivalent		
3	Battery, main (11.1 V)	F2157-60901		Yes
4	Cable, HDD/LED flex	F2157-60934		
	Card, mini-PCI (HW modem)	F2157-60928		Yes
	Card, mini-PCI (HW modem with regulatory labels for China, Malaysia, or South Africa)	F2157-60929		Yes
	Card, mini-PCI (LAN/modem)	F2072-60902		Yes
	Card, mini-PCI (LAN/modem with regulatory labels for China, Malaysia, or South Africa)	F2072-60994		Yes
5	Case, bottom	F3476-60999		
6	Case, top	F2157-60998		
6	Case, top	F3476-60998		
	Clip, wireless cable (not shown)	TBD		
7	Cover, SDRAM	F2157-60906		Yes
8	Display assembly, 12 in	F2157-60904	F2157-69004	
8	Display assembly, 12 in (wireless 802.11 radio)	F3476-60904	F3476-69004	
9	Drive, hard disk (7.5 GB, 9.5 mm, Hitachi)	0950-4011	F2112-69002	Yes
9	Drive, hard disk (7.5 GB, 9.5 mm, IBM)	0950-4030	F2112-69003	Yes
9	Drive, hard disk (10 GB, 9.5 mm, IBM, DJSA-210)	0950-3934	F1660-69112	Yes
9	Drive, hard disk (10 GB, 9.5 mm, Toshiba, MK1016 GAP)	0950-3985	F2072-69109	Yes
9	Drive, hard disk (20 GB, 9.5 mm, IBM, DJSA-220)	0950-3935	F1660-69113	Yes
9	Drive, hard disk (30 GB, 9.5 mm, IBM, 07N6714)	0950-4162	F2072-69115	Yes
10	Fan	F2157-60952		
11	Guide, hard drive	F2157-60935		
12	Heatsink	F3476-60951		
13	Keyboard, Arabic/English	F2157-60953		Yes
13	Keyboard, Belgian	F2157-60908		Yes
13	Keyboard, Czech	F2157-60909		Yes
13	Keyboard, Danish	F2157-60910		Yes
13	Keyboard, French	F2157-60911		Yes
13	Keyboard, French Canadian	F2157-60912		Yes
13	Keyboard, German	F2157-60913		Yes
13	Keyboard, Greek	F2157-60914		Yes
13	Keyboard, Hebrew	F2157-60926		Yes
13	Keyboard, Hungarian	F2157-60927		Yes
13	Keyboard, International English	F2157-60915		Yes
13	Keyboard, Italian	F2157-60916		Yes
13	Keyboard, Japanese	F2157-60917		Yes
13	Keyboard, Norwegian	F2157-60918		Yes
13	Keyboard, Portuguese	F2157-60919		Yes
13	Keyboard, Russian	F2157-60954		Yes
13	Keyboard, Spanish	F2157-60920		Yes

	Description	Part Number	Exchange Part Number	User-Repl.
13	Keyboard, Swedish/Finnish	F2157-60921		Yes
13	Keyboard, Swiss	F2157-60922		Yes
13	Keyboard, Traditional Chinese	F2157-60925		Yes
13	Keyboard, Turkish	F2157-60923		Yes
13	Keyboard, U.K. English	F2157-60924		Yes
13	Keyboard, U.S. English	F2157-60907		Yes
	Kit, OB500 feet/bumpers	F2157-60945		Yes
14	Covers, display screw—dark (4 in kit)	(see above kit)		Yes
15	Covers, display screw—light (8 in kit)	(see above kit)		Yes
16	Feet, computer (8 in kit)	(see above kit)		Yes
	Feet, expansion base (8 in kit)	(see above kit)		Yes
	Kit, OB500 screws	F2157-60944		Yes
17	Screw, M2x2mm (silver, large head)	(see above kit)		
18	Screw, M2x2mm (black)	(see above kit)		
19	Screw, M2x3mm	(see above kit)		
20	Screw, M2x5mm	(see above kit)		
21	Screw, M2x7mm	(see above kit)		
22	Screw, M2x9mm	(see above kit)		
23	Screw, M3x3mm	(see above kit)		
24	Standoff, 5mm x M2.5x4mm	(see above kit)		
	Label, telecom regulatory (HW modem)	F2157-60942		
	Label, telecom regulatory (LAN/modem)	F2157-60943		
	Overlay, serial label	7121-7525		
25	Panel, audio/PCMCIA	F2157-60931		
26	Panel, power button	F2157-60903		Yes
27	PCA, motherboard (Celeron 500 MHz)	F2157-60939	F2157-69039	
27	PCA, motherboard (Pentium III 600 MHz)	F2157-60937	F2157-69037	
27	PCA, motherboard (Pentium III 700 MHz)	F2157-60938	F2157-69038	
27	PCA, motherboard (Pentium III 700 MHz, for wireless 802.11 radio and infrared)	F3476-60938	F3476-69038	
27	PCA, motherboard (Celeron 600 MHz, for wireless 802.11 radio and infrared)	F3476-60939	F3476-69039	
27	PCA, motherboard (Pentium III 750 MHz, for wireless 802.11 radio and infrared)	F3476-60940	F3476-69040	
28	PCA, switchboard	F2157-60936		Yes
28	PCA, switchboard (for wireless 802.11 radio)	F3476-60936		Yes
35	Plate, EMI	F3476-60901		
	SDRAM module, 64 MB, PC100 SODIMM	1818-7951	F1660-69103	Yes
	SDRAM module, 64 MB, PC133 SODIMM	1818-8510		Yes
	SDRAM module, 128 MB, PC100 SODIMM	1818-7952	F1660-69104	Yes
	SDRAM module, 128 MB, PC133 SODIMM	1818-8504	TBD	Yes
	SDRAM module, 256 MB, PC100 SODIMM	1818-7953	F1654-69101	Yes
	SDRAM module, 256 MB, PC133 SODIMM	1818-8534	TBD	Yes
29	Set, docking door	F2157-60941		
	Set, hinge covers	F3476-60946		Yes
30	Cover, left hinge	(see above kit)		Yes
31	Cover, right hinge	(see above kit)		Yes

	Description	Part Number	Exchange Part Number	User-Repl.
	Set, mini-PCI panels	F2157-60947		
32	Panel, mini-PCI (HW modem)	(see above kit)		
32	Panel, mini-PCI (LAN/modem)	(see above kit)		
32	Panel, mini-PCI (blank)	(see above kit)		
	Set, telecom stickers	F2157-60948		Yes
	Sticker, Chinese telecom (10 in set)	(see above kit)		Yes
	Sticker, Malaysian telecom (10 in set)	(see above kit)		Yes
	Sticker, South African telecom (10 in set)	(see above kit)		Yes
33	Speaker assembly	F3476-60933		
34	Tray, hard disk drive	F2157-60902		Yes

Table 4-2. Accessory Replaceable Parts

Description	Part Number	Exchange Part Number	User Repl.
Adapter, AC (60W) (F1454A)	0950-3634		Yes
Adapter, AC, auto/airline (75W, 12 V output)	F1455-80003		Yes
Adapter, AC, Ultraslim (60W, 19 V output)	0950-3988		Yes
Battery, main (11.1 V)	F2157-60901		Yes
Battery, secondary module	F2014-60901		Yes
Cable, floppy disk drive, parallel	F2008-60901		Yes
Cable, floppy disk drive, USB	F2157-60949		Yes
Charger, secondary battery module (for F2014-60901)	F2011-60901		Yes
Cord, power, Argentina (2w)	8120-8367		Yes
Cord, power, Australia #ABG (2w)	8120-6312		Yes
Cord, power, Chile (2w)	8120-8452		Yes
Cord, power, Europe #ABB (2w)	8120-6314		Yes
Cord, power, India/S. Africa #ACQ (2w)	8120-6317		Yes
Cord, power, Japan #ABJ (2w)	8120-6316		Yes
Cord, power, People's Rep. Of China #AB2 (2w)	8120-8373		Yes
Cord, power, U.S./Canada/Taiwan #ABA (2w)	8120-6313		Yes
Cord, power, UK (EPSR) Hong Kong/Singapore (2w)	8120-8699		Yes
Expansion base, multimedia	F2096-60901	F2096-69001	Yes
Module, CD-ROM drive	F2017-60901		Yes
Module, CD-RW drive	F2026-60902	F2026-69002	Yes
Module, DVD drive	F2015-60902		Yes
Module, floppy disk drive	F2013-60901		Yes
Module, LS-120 drive	F2022-60901		Yes
Module, second hard drive holder	F2072-60910		Yes
Module, weight saving	F2072-60922		Yes
Module, Zip drive (100-MB)	F2009-60902		Yes
Plug, adapter, auto/airline	5182-5131		Yes
SDRAM module, 64 MB, PC100 SODIMM	1818-7951	F1660-69103	Yes
SDRAM module, 64 MB, PC133 SODIMM	1818-8510		Yes
SDRAM module, 128 MB, PC100 SODIMM	1818-7952	F1660-69104	Yes
SDRAM module, 128 MB, PC133 SODIMM	1818-8504	TBD	Yes
SDRAM module, 256 MB, PC100 SODIMM	1818-7953	F1654-69101	Yes
SDRAM module, 256 MB, PC133 SODIMM	1818-8534	TBD	Yes

Table 4-3. Part Number Reference

Part Number	Exchange Part Number	Description	User Repl.
0950-3634		Adapter, AC (60 watt) (F1454A)	Yes
0950-3934	F1660-69112	Drive, hard disk (10 GB, 9.5 mm, IBM, DJSA-210)	Yes
0950-3935	F1660-69113	Drive, hard disk (20 GB, 9.5 mm, IBM, DJSA-220)	Yes
0950-3985	F2072-69109	Drive, hard disk (10 GB, 9.5 mm, Toshiba, MK1016 GAP)	Yes
0950-3988		Adapter, AC, Ultraslim (60 W, 19 V output)	Yes
0950-4011	F2112-69002	Drive, hard disk (7.5 GB, 9.5 mm, Hitachi)	Yes
0950-4030	F2112-69003	Drive, hard disk (7.5 GB, 9.5 mm, IBM)	Yes
0950-4162	F2072-69115	Drive, hard disk (30 GB, 9.5 mm, IBM, 07N6714)	Yes
1818-7951	F1660-69103	SDRAM module, 64 MB, PC100 SODIMM	Yes
1818-8510		SDRAM module, 64 MB, PC133 SODIMM	Yes
1818-7952	F1660-69104	SDRAM module, 128 MB, PC100 SODIMM	Yes
1818-8504	TBD	SDRAM module, 128 MB, PC133 SODIMM	Yes
1818-7953	F1654-69101	SDRAM module, 256 MB, PC100 SODIMM	Yes
1818-8534	TBD	SDRAM module, 256 MB, PC133 SODIMM	Yes
5182-5131		Plug, adapter, auto/airline	Yes
5182-5138		Cover, Trackpoint (bag of 3, Rasp Red)	Yes
5184-2085		Label, COA, Microsoft Windows 2000 OS	
5184-2097		Label, COA, Microsoft Windows 98 OS	
7121-7525		Overlay, serial label	
8120-6312		Cord, power, Australia/New Zealand #ABG (2w)	Yes
8120-6313		Cord, power, U.S./Canada/Taiwan/Mexico/Philippines #ABA (2w)	Yes
8120-6314		Cord, power, Europe/Egypt/Israel/S. Arabia #ABB (2w)	Yes
8120-6316		Cord, power, Japan #ABJ (2w)	Yes
8120-6317		Cord, power, India/S. Africa #ACQ (2w)	Yes
8120-8367		Cord, power, Argentina (2w)	Yes
8120-8373		Cord, power, People's Rep. Of China #AB2 (2w)	Yes
8120-8452		Cord, power, Chile (2w)	Yes
8120-8699		Cord, power, UK (EPSR) Hong Kong/Singapore (2w)	Yes
F1455-80003		Adapter, AC, auto/airline (75W, 12 V output)	Yes
F2008-60901		Cable, floppy disk drive, parallel	Yes
F2009-60902		Module, Zip drive (100-MB)	Yes
F2011-60901		Charger, secondary battery module (for F2014-60901)	Yes
F2013-60901		Module, floppy disk drive	Yes
F2014-60901		Battery, secondary module	Yes
F2015-60902		Module, DVD drive	Yes
F2017-60901		Module, CD-ROM drive	Yes
F2022-60901		Module, LS-120 drive	Yes
F2026-60902	F2026-69002	Module, CD-RW drive	Yes
F2072-60902		Card, mini-PCI (LAN/modem)	Yes
F2072-60910		Module, second hard drive holder	Yes
F2072-60922		Module, weight saving	Yes
F2072-60994		Card, mini-PCI (LAN/modem w/regulatory)	Yes
F2096-60901	F2096-69001	Expansion base, multimedia	Yes

Part Number	Exchange Part Number	Description	User Repl.
F2156-60919		Recovery CD, Spanish, W98 (Mfg. P/N F2157-12019R1)	
F2156-60941		Recovery CD, North American English, W2K (Mfg. P/N F2157-12041)	
F2156-60942		Recovery CD, International English, W2K (Mfg. P/N F2157-12042)	
F2156-60943		Recovery CD, North American English, W98 (Mfg. P/N F2157-12043)	
F2156-60945		Recovery CD, International English, W98 (Mfg. P/N F2157-12045)	
F2156-60946		Recovery CD, Turkish, W98 (Mfg. P/N F2157-12046)	
F2156-60947		Recovery CD, Czech, W98 (Mfg. P/N F2157-12047)	
F2156-60948		Recovery CD, Dutch, W98 (Mfg. P/N F2157-12048)	
F2156-60949		Recovery CD, Danish, W98 (Mfg. P/N F2157-12049)	
F2156-60950		Recovery CD, Finnish, W98 (Mfg. P/N F2157-12050)	
F2156-60951		Recovery CD, Norwegian, W98 (Mfg. P/N F2157-12051)	
F2156-60953		Recovery CD, Finnish, W2K (Mfg. P/N F2157-12053)	
F2157-60901		Battery, main (11.1 V)	Yes
F2157-60902		Tray, hard disk drive	Yes
F2157-60903		Panel, power button	Yes
F2157-60904	F2157-69004	Display assembly, 12 in	
F2157-60906		Cover, SDRAM	Yes
F2157-60907		Keyboard, U.S. English	Yes
F2157-60908		Keyboard, Belgian	Yes
F2157-60909		Keyboard, Czech	Yes
F2157-60910		Keyboard, Danish	Yes
F2157-60911		Keyboard, French	Yes
F2157-60912		Keyboard, French Canadian	Yes
F2157-60913		Keyboard, German	Yes
F2157-60914		Keyboard, Greek	Yes
F2157-60915		Keyboard, International English	Yes
F2157-60916		Keyboard, Italian	Yes
F2157-60917		Keyboard, Japanese	Yes
F2157-60918		Keyboard, Norwegian	Yes
F2157-60919		Keyboard, Portuguese	Yes
F2157-60920		Keyboard, Spanish	Yes
F2157-60921		Keyboard, Swedish/Finnish	Yes
F2157-60922		Keyboard, Swiss	Yes
F2157-60923		Keyboard, Turkish	Yes
F2157-60924		Keyboard, U.K. English	Yes
F2157-60925		Keyboard, Traditional Chinese	Yes
F2157-60926		Keyboard, Hebrew	Yes
F2157-60927		Keyboard, Hungarian	Yes
F2157-60928		Card, mini-PCI (HW modem)	Yes
F2157-60929		Card, mini-PCI (HW modem w/regulatory)	Yes
F2157-60931		Panel, audio/PCMCIA	
F2157-60932		Battery, backup	
F2157-60934		Cable, HDD/LED flex	
F2157-60935		Guide, hard drive	

Part Number	Exchange Part Number	Description	User Repl.
F2157-60936		PCA, switchboard	Yes
F2157-60937	F2157-69037	PCA, motherboard (Pentium III 600 MHz)	
F2157-60938	F2157-69038	PCA, motherboard (Pentium III 700 MHz)	
F2157-60939	F2157-69039	PCA, motherboard (Celeron 500 MHz)	
F2157-60941		Set, docking door	
F2157-60942		Label, telecom regulatory (HW modem)	
F2157-60943		Label, telecom regulatory (LAN/modem)	
F2157-60944		Kit, OB500 screws	Yes
F2157-60945		Kit, OB500 feet/bumpers	Yes
F2157-60947		Set, mini-PCI panels	
F2157-60948		Set, telecom stickers	Yes
F2157-60949		Cable, floppy disk drive, USB	Yes
F2157-60952		Fan	
F2157-60953		Keyboard, Arabic/English	Yes
F2157-60954		Keyboard, Russian	Yes
F2157-60955		CD, OB500 Training	
F2157-60963		Recovery CD, German, W2K (Mfg. P/N F2157-12003)	
F2157-60964		Recovery CD, Spanish, W2K (Mfg. P/N F2157-12004)	
F2157-60965		Recovery CD, French, W2K (Mfg. P/N F2157-12005)	
F2157-60966		Recovery CD, Dutch, W2K (Mfg. P/N F2157-12006)	
F2157-60967		Recovery CD, Japanese, W2K (Mfg. P/N F2157-12007)	
F2157-60968		Recovery CD, Norwegian, W2K (Mfg. P/N F2157-12008)	
F2157-60969		Recovery CD, Swedish, W2K (Mfg. P/N F2157-12009)	
F2157-60971		Recovery CD, Danish, W2K (Mfg. P/N F2157-12011)	
F2157-60972		Recovery CD, Italian, W2K (Mfg. P/N F2157-12012)	
F2157-60973		Recovery CD, Traditional Chinese (Taiwan), W98 (Mfg. P/N F2157-12013)	
F2157-60974		Recovery CD, Simplified Chinese, W98 (Mfg. P/N F2157-12014)	
F2157-60978		Recovery CD, German, W98 (Mfg. P/N F2157-12018)	
F2157-60980		Recovery CD, French, W98 (Mfg. P/N F2157-12020)	
F2157-60981		Recovery CD, Japanese, W98 (Mfg. P/N F2157-12021)	
F2157-60982		Recovery CD, Hebrew, W98 (Mfg. P/N F2157-12022)	
F2157-60983		Recovery CD, Arabic, W98 (Mfg. P/N F2157-12023)	
F2157-60984		Recovery CD, Italian, W98 (Mfg. P/N F2157-12024)	
F2157-60986		Recovery CD, Hungarian, W98 (Mfg. P/N F2157-12026)	
F2157-60987		Recovery CD, Polish, W98 (Mfg. P/N F2157-12027)	
F2157-60988		Recovery CD, Russian, W98 (Mfg. P/N F2157-12028)	
F2157-60989		Recovery CD, Traditional Chinese (Hong Kong), W98 (Mfg. P/N F2157-12029)	
F2157-60990		Recovery CD, Greek, W98 (Mfg. P/N F2157-12030)	
F2157-60993		Recovery CD, Swedish, W98 (Mfg. P/N F2157-12033)	
F2157-60996		Recovery CD, Swiss, W98 (Mfg. P/N F2157-12036)	
F2157-60998		Case, top	
F2196-80001		Bluetooth PC Card	Yes
F2296-60901		USB infrared port	Yes
F3476-60901		Plate, EMI	

Part Number	Exchange Part Number	Description	User Repl.
F3476-60904	F3476-69004	Display assembly, 12 in (wireless 802.11 radio)	
F3476-60933		Speaker assembly	
F3476-60936		PCA, switchboard (for wireless 802.11 radio)	Yes
F3476-60938	F3476-69038	PCA, motherboard (Pentium III 700 MHz, for wireless 802.11 radio and infrared)	
F3476-60939	F3476-69039	PCA, motherboard (Celeron 600 MHz, for wireless 802.11 radio and infrared)	
F3476-60940	F3476-69040	PCA, motherboard (Pentium III 750 MHz, for wireless 802.11 radio and infrared)	
F3476-60946		Set, hinge covers	Yes
F3476-60951		Heatsink	
F3476-60998		Case, top	
F3476-60999		Case, bottom	
TBD		Clip, wireless cable	

5

Reference Information

This chapter includes the following reference information:

- Password removal policy.
- Display quality statement.

Password Removal Policy

If the user forgets the system password, the user calls HP Customer Care to determine the proper removal procedure. The user must provide proof of ownership, and the computer 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 computer 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 notebook display.*

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

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

1. View the 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. Displays with cosmetic imperfections that do not conform to the above conditions and tests will not normally be considered for replacement. The HP-responsible person working with the customer should identify work-arounds that are reasonable and appropriate for that customer. Customers who require a more perfect display solution should consider switching to a notebook 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 500 LCD Guidelines (12.1-in TFT, XGA)

Type of Imperfection	TFT Cosmetic Specifications
Electrical Imperfections: Bright dots [a] Dark dots [a]	• No more than 6 single bright dots. • No more than 6 single dark dots. • No more than 8 total (bright and dark combined) defective dots. • No occurrence of multiple defective dots within 15 mm.
Mechanical Imperfections: Discoloration Polarizer bubbles, scratches [b]	• No polarizer discoloration, bubble, or scratch 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 A polarizer bubble is a light spot with a darker border that appears on a lighted display and does not change size. A polarizer scratch is a light line that is visible on a darker background and does not change size.	

Obsolete Parts

The following table summarizes obsolete repair parts.

Table 5-2. Obsolete Repair Parts

Obsolete Part Number	New Part Number	Description	Service Notes/Comments
F2157-60930	F3476-60998	Case, top	
F2157-60933	F3476-60933	Speaker assembly	
F2157-60940	F3476-60999	Case, bottom	
F2157-60946	F3476-60946	Set, hinge covers	
F2157-60950	F2096-60901	Expansion base, multimedia	
F2157-60951	F3476-60951	Heatsink	
F2157-60999	F3476-60999	Case, bottom	